O1-1

LONG-TERM OUTCOMES FOLLOWING IMMEDIATE AORTIC REPAIR FOR ACUTE TYPE A AORTIC DISSECTION COMPLICATED BY COMA

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Objectives: Management of acute type A aortic dissection complicated by coma remains controversial. We previously reported an excellent recovery of consciousness for patients with coma if aortic repair performed within 5 hours from onset of symptoms. This study evaluates the early and long-term outcomes with this approach.

Methods: Between 9/03 and 11/12, 176 patients with acute type A aortic dissection were treated surgically, including 28 (15.9%) presented with coma (Glasgow Coma Scale <11) on arrival. Twenty-three patients (82%) were repaired immediately; time from onset of symptoms to operating room less than 7 hours. The mean age of the patients with immediate aortic repair was 70.9 (SD 11.4) years, and prevalence of shock and carotid dissection was 48% (11/23), and 74% (17/23), respectively. Neurological deficit, such as hemiplegia or concomitant deviation of eyes, coexisted in 74% (17/23). For brain protection, deep hypothermia with antegrade cerebral perfusion was utilized and postoperative induced hypothermia for 48 hours was performed.

Results: Time from onset of symptoms to operating room was 204 (SD 60) minutes. Hospital mortality of the comatose patients who had immediate aortic repair was 13.0% (3/23). Full recovery of consciousness was achieved in 83% (19/23) in 30 days after repair, and the incidence of coexisted neurological deficits was significantly decreased postoperatively (52%: 12/23). The mean follow-up periods was 48.7 (SD 37.0) months. Cumulative survival rate was 69.6% in 8 years, and ADL independence was achieved in 63% (12/19).

Conclusions: Early and long-term outcomes following the strategy of immediate aortic repair, performed within 7 hours from onset of symptoms, for acute type A aortic dissection complicated by coma were satisfactory. Timely surgical repair is strongly recommended.

O1-2

THE CENTRAL CANNULATION BY SELDINGER METHOD IN TYPE A ACUTE AORTIC DISSECTION - FROM 130 CONSECUTIVE CASES EXPERIENCE-

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Background: The site of cannulation for the repair of type A acute aortic dissection remains controversial. It is not clear whether cannulation of the dissected vessel is safe or even preferred. We hypothesized that cannulation of the dissected ascending aorta could be done safely with acceptable complication and mortality rates in this high-risk population.

Methods: Between 2007 and 2012, 130 patients underwent prosthetic graft replacement of the ascending aorta or aortic arch for acute type A aortic dissection. We always tried cannulation via the dissected aorta. We choose other site (femoral artery (FA) subclavian artery (SCA), left ventricle (LV)) if not possible. The procedure started with a median sternotomy, followed by cannulation through the right atrial appendage and the ascending aorta under epiaortic echo guiding with Seldinger method. We study central cannulation success rate, convert reason, complication, morbidity and mortality

Results: Central cannulation success rate was 94% (122/130). We converted to FA (2 patients), SCA (3patients) and LV apex (3patients). The reasons of cannulation convert were inadequate perfusion flow, collapse of ascending aorta for massive bleeding or arrest and complete disjunction of aortic intima. The rate of preoperative shock was 43%. The average time from skin incision to cardiopulmonary bypass in Central cannulation was 27min. Hospital mortality rate was 5.3%. ventilation time was 88.4Hrs., Hospital stay was 34.5days, there was no complication related central cannulation.

Conclusion: Direct cannulation of the dissected aorta was rapid and safe compared with peripheral cannulation in these patients. This technique can provide unrestricted antegrade flow, and is particularly useful in true lumen collapse.

O1-3

LONG-TERM RESULTS AND FACTORS DETERMINING AORTIC ENLARGEMENT IN PATIENTS WITH NON-COMPLICATED STANFORD TYPE-B ACUTE AORTIC DISSECTION

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Objectives: To investigate the long-term results and factors determining aortic enlargement in the chronic phase in patients with non-complicated Stanford type-B acute aortic dissection (NCSBD).

Methods: Sixty five patients with an onset of NCSBD between 2000 and 2009 were treated medically and followed up through September 2012. The aortic dilatation rate (ADR) was analyzed regarding two factors (initial aortic diameter; thrombotic occlusion of the false lumen) in 18 of 65 patents using CT scans during the follow-up period (1485±939 days). The patients were divided into two groups, group G (40 mm or grater) and group S (less than 40 mm) in terms of the initial diameter. In a separate analysis, the patients were divided into two groups, group P (patent) and group T (thrombosed) in terms of the state of the false lumen.

Results: Six (9.2%) of 65 patients underwent 7 elective aortic operations due to aortic enlargement with no postoperative mortality. The rate free from aortic operations was 91.8% and 86.0% at 5 years and 10 years, respectively. There was no difference in the ADR between the groups G and S (5.6±8.2 and 3.8±4.0 %/year, respectively, p=0.735; 3.1±4.3 and 1.3±1.4 mm/year, respectively, p=0.894). The ADR was greater (but not significant) in the group P than that in the group T (6.2±5.3 and 1.4±5.8 %/year, respectively, p=0.088; 3.2±3.0 and 0.5±2.3 mm/year, respectively, p=0.060). The diameter change in the acute phase (4 weeks after onset) was significantly correlated with that in the chronic phase (p=0.027).

Conclusions: The long-term results of medically-treated NCSBDs were satisfactory, but surgical therapy was required due to aortic enlargement in less than 10% of the patients. A patent false lumen, rather than a large initial aortic diameter, may be a determinant of aortic enlargement, and especially the diameter change in the acute phase may be important.

O1-4

SIZE DECISION OF THE FROZEN ELEPHANT TRUNK FOR ACUTE TYPE A AORTIC DISSECTION

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Objective:

Although prophylactic repair of the descending aorta using frozen elephant trunk (FET) for acute type A aortic dissection (AAD) has been acceptable, there are no general accepted recommendations regarding the size decision of the stent graft (SG). This study aims to evaluate decision of appropriate SG size.

Methods:

The FET was performed on 110 patients with AAD between Sept. 1997 and Oct. 2012. The SG was chosen according to the diameter of true lumen on the descending aorta at level of T6 vertebrae by direct measurement using ball shaped sizer under trans-esophageal aortic echo guidance.

Results:

The SG was chosen with diameter 24 to 32mm (mean 27.7mm), mean length 9.9cm and mean distal depth T6.0. Total aortic diameter was 27 to 35mm (mean 30.8mm) and trace diameter of true lumen measured according to preoperative CT was 17 to 25mm (mean 20.7mm). Five patients died in hospital. Early morbidity included 3 strokes and 1 spinal cord injury. The diameter of distal SG was 20 to 30mm (mean 26.0mm) on early postoperative CT and 24 to 32mm (mean 27.5mm) on late postoperative CT. Only one patient had patent false lumen because of a new tear on the SG 6 months after operation. In follow-up (mean 77+-52 months) 14 patients died of non-aortic events and one replacement and three endovascular SG were required.

Conclusion:

Sizing the SG of the FET according to direct measurement and choosing a distal landing zone on the vertebrae T6 is safe with low long-term mortality and morbidity. We concluded 5-10 % size down compared with total aortic diameter was recommended as an appropriate diameter of SG.

O1-5

WITHDRAWN

O1-6

IMPACT OF PREOPERATIVE HEMODYNAMIC SHOCK BY CARDIAC TAMPONADE ON SURGICAL OUTCOME OF ACUTE TYPE A AORTIC DISSECTION

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Objective; Hemodynamic shock due to cardiac tamponade in acute type A aortic dissection is a life-threatening condition and might affect the surgical procedure and the outcomes.

Methods; From February 1999 to June 2011, 142 consecutive patients (male:female = 76:66, Mean age 56.5±13.9), who underwent a surgical repair of acute type A aortic dissection, were reviewed retrospectively. Among them, 44 patients (31.0%, Group A) showed preoperative hemodynamic shock by a cardiac tamponade and compared with the other 98 patients (Group B).

Results; As preoperative variables, Group A was younger (mean age: 64.0 vs. 53.2 years old, $p < 0.001$), had more female (63.6% vs. 38.8%, $p = 0.007$), and more DeBakey type 2 dissection (36.4% vs. 12.2%, $p = 0.01$). Axillary artery cannulation was less frequently used in group A (27.3% vs. 45.9%, $p = 0.043$). Femoral artery (65.9% vs. 58.2%, $p= 0.459$) and innominate artery (11.4% vs. 1.0%, $p = 0.011$) cannulation were more frequently used in group A. There was no statistical difference in the methods of brain protection and surgical extents. Hospital mortality occurred in 9.1% of group A and 6.1% of group B ($p = 0.5$). Brain damage occurred in 13.6% of group A and 7.1% of group B ($p = 0.223$). There was no statistically significant difference between the two groups in terms of the other complications.

Conclusions; Hemodynamic shock due to cardiac tamponade in acute type A aortic dissection affected the cannulation method. However, the impact on the surgical outcome was insignificant. Rapid institution of cardiopulmonary bypass and strategic modifications to deal with a cardiac tamponade will nullify the ferocious aftermath of shock by cardiac tamponade in acute type A aortic dissection.

O1-7

ASCENDING AORTA CANNULATION IS SAFE IN TYPE A ACUTE AORTIC DISSECTION REPAIR

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Objective: Antegrade central perfusion for type A acute aortic dissection prevents malperfusion and retrograde cerebral embolism during cardiopulmonary bypass. Prompt establishment of ante grade perfusion via ascending aorta may improve the surgical results of type A dissections, especially in the situations of hemodynamic instability. Thus, we evaluated the safety and efficacy of use of the dissected ascending aorta in acute type A dissection.

Methods: The cherts of repairs of acute ascending aortic dissections(n=47) from 2010 to 2012 were reviewed. Cannulation was accomplished in 26 patients via the ascending aorta or the apical location of the cannula(central) and in 21 patients through cannulation of the femoral or axillary artery(peripheral). The ascending aorta was routinely cannulated, using Seldinger technique, and by epiaortic ultrasonographic guidance. Groups were compared on the basis of comorbidities in addition to mortality, complications, hospital stays.

Results: The ascending aorta was routinely cannulation was safety performed in all cases. There was no malperfusion or thromboembolism due to ascending aorta cannultaion. The peripheral group experienced differences cardiopulmonary bypass was established average time (peripheral 123 minutes vs central 44 minutes; $p<0.05$) and higher mortality than the central group (peripheral 19% vs central 4.7%; $p<0.05$).

Conclusions: Antegrade central perfusion via the ascending aorta was safe compared with peripheral cannulation in these patients. There was a simple and safe technique that enables rapid establishment of ante grade systemic perfusion in patients with type A acute aortic dissection.

O1-8

DO DEBAKEY CLASSIFICATIONS REFLECT OUTCOMES AFTER SURGERY FOR ACUTE TYPE A AORTIC DISSECTION?

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OBJECTIVE: The DeBakey classification system is an anatomical description of aortic dissection based on the location of the entry site and extent of the dissection. We investigated whether DeBakey classifications reflect outcomes after surgery for acute type A aortic dissection (AAAD).

METHODS: Subjects were 427 consecutive patients with AAAD treated surgically between January 1990 and January 2011. The subject group did not include patients treated by ringed intraluminal graft (n=16). Subjects were divided into 3 groups per DeBakey classification: Type I (n=278), Type II (n=44), and Type IIIa or b retrograde (IIIR) (n=105) AAAD. Our surgical strategy is entry-oriented; if the entry site could not be identified or was identified in the descending aorta, the ascending aorta was simply replaced. Early and late outcomes in each group were compared.

RESULTS: Marfan syndrome, severe aortic regurgitation, and limb ischemia were most prevalent in the Type I group, and advanced age, female sex, shock, and coma were most prevalent in the Type II group. Arch replacement was performed in 22% of Type I patients, 2% of Type II patients, and 6% of Type IIIR patients, and the entry orifice was resected in 100%, 89%, and 6% of patients, respectively. Hospital mortality was 9% (25/278), 7% (3/44), and 13% (13/105), respectively. There was no difference in the incidence of complications. Actuarial survival at 8 years was 69%, 61%, and 70%, respectively (log-rank, not significant), and freedom from an aortic event at 8 years was 81%, 97%, and 84%, respectively (log-rank, not significant).

CONCLUSIONS: Although resection was performed in remarkably few Type IIIR cases, outcomes were acceptable. Although there was a tendency that aortic event-free rate was lower in the Type II group, survival was similar between the groups. Our results suggest that DeBakey classifications do not necessarily reflect outcomes after surgery for AAAD.

O1-9

IMPACT OF THE LOCATION OF ULCER-LIKE PROJECTION OR PATENT FALSE LUMEN ON CLINICAL OUTCOMES IN AORTIC DISSECTION WITH THROMBOSED FALSE LUMEN OF ASCENDING AORTA

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OBJECTIVE: This study divides type A acute aortic dissection (AAD) with thrombosed false lumen of ascending aorta by the location of ulcer-like projection (ULP) or patent false lumen and analyzes the clinical outcomes.

METHODS: Between January 2005 and June 2012, computed tomography images of 77 patients with AAD with thrombosed false lumen of ascending aorta were able to be analyzed in our institution. We divided them into group A (n=23): cases having ULP or patent false lumen in the descending or abdominal aorta, group B (n=23): cases having ULP in ascending aorta or aortic arch, and group C (n=31): cases having neither ULP nor patent false lumen.

RESULTS: The maximum ascending aortic diameter in group A was smallest (respectively 42.9±4.8 mm, 48.0±4.8 mm, and 44.7±5.0 mm in group A, B, and C, P<0.01). Cases having massive pericardial effusion were 22%, 70%, and 39% in group A, B, and C, respectively (P<0.01). Less patients underwent emergent surgical central aortic repair in group A than in the other groups (respectively 43%, 87%, and 61% in group A, B, and C, P<0.01). Two patients in group B and 3 patient in group C underwent medical therapy first but needed central aortic repair later. In-hospital mortality was 0%, 4%, and 13% in group A, B, and C, respectively. After mean follow-up of 36.7±27.2 months,cases of late death were 1. 3. and 2 in group A, B, and C, respectively.

CONCLUSIONS: In AAD having thrombosed false lumen of ascending aorta and ULP or patent false lumen in the descending or abdominal aorta, less cases needed central aortic repair, for they had smaller maximum aortic diameter and less pericardial effusion. In addition, these patients had good clinical outcomes in hospital and long-term.

O2-1

RADICAL OPEN ENDVENECTOMY WITH PERICARDIAL PATCH GRAFT FOR CORRECTION OF BUDD-CHIARI SYNDROME

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Background: We previously reported the value of our operative procedure for Budd-Chiari syndrome (BCS) that comprised reconstruction of the occluded or severely stenosed inferior vena cava (IVC) using an autologous pericardium patch and reopening as many occluded hepatic veins as possible. Here, we present the long-term durability and efficacy of the autologous pericardium patch for reconstruction of the IVC in BCS.

Methods: We retrospectively analyzed a series of 61 consecutive patients (mean age, 47.9 ± 13.0 years; range 24-76 years; male: female, 39:22) who underwent surgical treatment for BCS at our institution from 1979 to 2012. Patency of the IVC and hepatic veins was examined by venography at discharge and then the patients attended an outpatient clinic every 1 or 2 months for follow-up. The reconstructed IVC was evaluated by enhanced computed tomography every 1 or 2 years.

Results: Two in-hospital (operative mortality: 3.2%) and fifteen late deaths occurred. During a mean follow up period of 8.4 ± 6.4 (range, 0 to 28) years, the reconstructed IVC became totally obstructed in 3 patients, of whom 2 underwent reoperation, and severely stenosed in 2 patients who required percutaneous trans-venous balloon venoplasty (PTV). The cumulative 5- and 10- year survival rates were 90.6 % and 66.4%, respectively.

Conclusion: The autologous pericardium patch is effective and durable for reconstructing a diseased IVC in BCS.

♥ O2-2

PULMONARY ENDARTERECTOMY FOR CHRONIC THROMBOEMBOLIC PULMONARY HYPERTENSION: THE ST. VINCENT'S HOSPITAL EXPERIENCE

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Objectives: Pulmonary endarterectomy (PEA) represents a curative therapeutic option for patients with surgically amenable chronic thromboembolic pulmonary hypertension (CTEPH). This retrospective study evaluates the safety, morbidities, survival and subsequent haemodynamic and functional outcomes of PEAs conducted at St. Vincent's Hospital, Darlinghurst, Australia.

Methods: 15 consecutive CTEPH patients (mean age, 67 ± 9 years) underwent PEA between November 2010 and November 2012. PEA involved median sternotomy, cardiopulmonary bypass and deep hypothermic circulatory arrest (DHCA at 20°C) to allow for a complete endarterectomy. 3 patients required concomitant coronary artery bypass surgery. 2 patients with pulmonary angiosarcoma were excluded. All patients were New York Heart Association (NYHA) classes II (n=2), III (n=9) or IV (n=4) pre-operatively. Follow-up was at 3, 6 and 12 months.

Results: Pulmonary vascular resistance improved immediately post-operatively from average 931 ± 363 dynes/sec/cm5 to 343 ± 63 dynes/sec/cm5 (p=0.00001). Consequently, mean pulmonary arterial pressure fell from 50.3 ± 11.9 mmHg to 31.8 ± 4.1 mmHg (p=0.000001). Cardiac index improved from 2.1 ± 0.5 l/min/m2 to 2.7 ± 0.5 l/min/m2 (p=0.006). This haemodynamic improvement translated functionally, with six-minute-walk test scores increasing from 327 ± 97 m pre-operatively to 408 ± 46 m 6 months post-PEA (p=0.005) and 434 ± 62 m 12 months post-PEA (p=0.06). There was one mortality (6.7%) resulting from persistent pulmonary hypertension in a patient with pre-operative decompensated right-heart-failure, in whom PEA was a salvage procedure. At the last follow-up, patients were in NYHA classes I (n=7) and II (n=5) with 2 patients awaiting 3 month follow-up. Mean bypass time was 354 ± 48 minutes, mean cross-clamp time was 86 ± 28 minutes and mean DHCA time was 51 ± 15 minutes.

Conclusions: In CTEPH patients with surgically accessible disease, PEA leads to immediate reduction in pulmonary pressures followed by significant improvements in exercise capacity and quality-of-life.

♥ : Travel Grant

O2-3

POTENTIAL ROLE OF OMENTAL WRAPPING TO PREVENT INFECTION AFTER TREATMENT FOR INFECTIOUS THORACIC AORTIC ANEURYSMS

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[Objective]

Postoperative infection control is one of the most important issues for infected aortic aneurysms, and methods of preventing recurrent infection remain controversial. We previously reported that omental flaps could prevent or reduce the occurrence of infection after implanting an artificial aortic graft. However, the long-term outcomes of this strategy are unknown. We used imaging modalities to evaluate whether wrapping prosthetic grafts with omentum prevents postoperative graft infection over the long term.

[Patients and methods]

We surgically treated 521 patients with thoracic aortic aneurysm (TAA) at our hospital between July 1995 and May 2012. Of these, 22 (3.9%) (male, n = 17; mean age, 68.2 ± 11.4 years) had infectious TAA. All infectious aneurysms were resected, all patients received in-situ grafts and 16 grafts were wrapped with omentum. We followed-up all survivors annually using computed tomography. We also used angiography to investigate blood circulation in omental flaps over the long term.

[Results]

Five patients died in hospital (operative mortality, 26.3%). The operative mortality rates of patients with and without omental wrapping were 12.5% and 50.0%, respectively ($p = 0.06$, NS), and the 5-year event-free survival rates were 84.6% and 33.3% ($p = 0.025$), respectively. Omental flaps around prosthetic grafts and their blood circulation were well preserved over the long term.

[Conclusion]

Wrapping implanted artificial aortic grafts with omental flaps could prevent or reduce the occurrence of subsequent infection. Furthermore, blood circulation in the flaps must be well preserved to improve long-term outcomes.

O2-4

FINITE ELEMENT ANALYSIS FOR THORACIC AORTIC ANEURYSM: AN ATTEMPT TO PREDICT A RISK OF RUPTURE

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[Objectives] We previously established the method to create finite element models for thoracic aortic aneurysm. The objective of this study is to estimate high-risk ranges of maximal von Mises stress (max VMS) acting on thoracic aortic aneurysms with imminent rupture.

[Patients and Methods] Eight patients with a diagnosis of impending rupture of thoracic aortic aneurysm were the subjects for finite element analysis. Randomly selected twelve patients with stable thoracic aortic aneurysm served as historical cohort. Three dimensional image reconstruction of the entire thoracic aorta was carried out by surface rendering method after tracing a boundary of the aortic wall. A finite element model for each patient was created using ANSYS ver. 14 via the processes of meshing with assumptions of wall thickness as 2mm, elastic modulus 2.6 MPA(MegaPascal), and Poisson's ratio 0.499. The other conditions included the four constraints of the aorta at the pericardium, arch vessels, intercostal arteries and diaphragm, and systemic pressure of 120 mmHg was applied to conform to a constant pressure model. Max VMSs at each element were calculated for failure analysis, and their distributions were illustrated for each patient.

[Results] Max VMSs were significantly higher in the impending rupture group compared with control (0.66MPA versus 0.47MPA, p=0.02). Max VMSs correlated with maximal diameters of the aneurysm, however, the locations of max VMSs were not necessary identical to the points with maximal diameter. Max VMS of 0.50MPA was the threshold for aortic rupture with positive predictive value of 75% in our model.

[Conclusions] Calculation of maximal von Mises stress using a finite element model is a promising technology to predict a rupture of thoracic aortic aneurysm.

O2-5

INVESTIGATION OF AORTIC SURGERY IN PATIENTS WITH MARFAN SYNDROME

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OBJECTIVE: The patients with Marfan syndrome (MFS) may require multiple aortic procedures. And the initial surgical procedure may affect the entire strategy of subsequent procedures. We investigated long-term outcomes of surgery for MFS patients according to the initial procedures and aortic pathologies.

METHODS: Twenty-two patients with MFS who underwent the initial aortic procedure at Hokkaido University Hospital between 1990 and 2012 were studied. We divided them into 3 groups: type A dissection (AD-A, n=6), type B dissection (AD-B, n=7), and annuloaortic ectasia without dissection (AAE, n=9).

RESULTS: There were 10 males and mean age was 35 ± 11 years. Mean follow-up period was 119 ± 73 months. Only one patient with AD-B died before discharge after Crawford II replacement), whereas 4 deaths without apparently aortic-related causes were observed during the follow-up. In those with AD-A, total arch replacement (TAR) was performed in all the cases, 4 of whom underwent concomitant aortic root replacement (ARR). Other 2 underwent ARR during the follow-up. Among them, 2 cases with residual IIIb dissection required Crawford II thoracoabdominal replacement. In those with AD-B, replacement of thoracoabdominal (Crawford II) and descending thoracic aorta were performed in 6 and 1 cases, respectively. The latter underwent additional Crawford III replacement during the follow-up. Among them, one case underwent TAR without ARR for new onset type A dissection. In those with AAE, ARR without TAR were done in all 9 cases. One case underwent Crawford II thoracoabdominal replacement for new onset type B dissection. The 10-year freedom from aortic interventions were 44, 60 and 80% in those with type AD-A, AD-B and AAE.

CONCLUSIONS: For those with AD-A, TAR without ARR was followed by ARR. AD-B (IIIb) resulted in broad aortic replacement. For those without dissection, AAR for AAE was not followed by subsequent TAR.

O2-6

OPEN AORTIC SURGERY FOR RUPTURED THORACIC ANEURYSM: CONTEMPORARY OUTCOME OF 31 PATIENTS

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OBJECTIVE:

The endovascular therapy for thoracic aortic aneurysm is becoming more common. However, in the case of rupture endovascular therapy has more limitations compared to the open repair, and the site of the lesion limits the indication. In this study, we present the results of surgery for rupture of thoracic aortic aneurysm at our institution.

METHODS:

Between January 2010 and November 2012, 31 patients were diagnosed with ruptured thoracic aortic aneurysm and had open aortic surgery in our institution. We retrospectively reviewed and analyzed the data.

RESULT:

21 patients were male, mean age was 73 years (range, 37 to 93 years), 5 patients were chronic kidney disease, and 3 patients had old myocardial infarction, 2 patients were Marfan's syndrome, and 7 patients underwent previous aortic surgery, and 3 patients were redo cases. 4 patients (16%) were hemiarch repair, 10 patients (32%) were total arch replacement, 6 patients (19%) were descending aorta repair, 11 patients (35%) were thoracoabdminal aortic repair (extent 1-5). For the matter of morphology, 12 patients were fusiform, 10 patients were saccular, and 10 patients were dissection. The median sternotomy approach is 14 cases, left thoracotomy approach was 17 cases. The mean of the maximum diameter is 66mm. Mean operative time was 484 min in median sternotomy and 365 min in left thoracotomy. The overall operative survival rate was 77% (24 of 31). The survival rate of left thoracotomy was 83% (14 of 17), and median survival rate is 71% (10 of 14).

CONCLUSION:

Our data suggests that open aortic repair of ruptured thoracic aneurysms can be performed with acceptable early outcomes, even in emergent cases. Open aortic repair of ruptured aneurysm is not so bad, even if descending or thoracoabdminal aortic aneurysm.

O3-1

FUNCTIONAL NEOCHORDAE LENGTH ADJUSMENT IN MITRAL VALVE REPAIR

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Introduction: Length adjustment of neochordae is crucial in mitral valve repair. The functional method is a dynamic process that ensures an optimal length is maintained during mitral valve repair incorporating placement of mitral annulus and leaflet repair techniques.

Materials and Methods: Prospective study of 12 patients with class 4 NYHA symptoms requiring neochordae for repair of mitral valve. Pledgeted 5/0 Polytetraflouroethylene (PTFE) sutures were used to create new chordae tendineae attaching pappilary muscle to edge of repaired mitral annulus. Annuloplasty rings or bands were placed prior to measurement. The left ventricle was filled with saline and pressure manometer in aortic root ensured adequate pressures (60 mm Hg) simulating physiological pressures when suture length was evaluated. Counter-traction sutures placed through the adjusted sutures maintained the length when tying sutures in place to complete the repair process. The patients were followed up for one year (mean follow up 8.5 months), with a Trans thoracic echocardiogram (TTE) done within 6 months.

Results : Neochordae placement was required for 6 patients in A2 segment, for 5 patients in P2 segment and one patient in P1 segment. Follow up TTE showed mild MR in 2 patients and trace MR in 7 patients. All patients were functionally normal at follow up.

Conclusion: The length measurement under simulated physiological conditions with a filled ventricle and counter-traction to adjust length facilitates easy and efficient mitral valve repair.

O3-2

THE VERIFICATION OF CURRENT GUIDELINE FOR MITRAL REGURGITATION: REVIEW OF TWENTY-YEAR EXPERIENCE OF MITRAL VALVE REPAIR FOR DEGENERATIVE MITRAL REGURGITATION

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OBJECTIVE: The aim of this study is to verify the current guideline for mitral regurgitation by reviewing long-term outcomes of mitral valve repair for degenerative mitral regurgitation in our institute.

METHODS: The consecutive 654 patients who underwent mitral valve repair for degenerative mitral regurgitation between 1991 and 2010 were retrospectively investigated. The mean age was 56.4±14.7 years old. One hundred and four patients (15.9%) had less than 60% of left ventricular ejection fraction (LVEF) and 126 patients (19.3%) had more than 40mm of LV systolic diameter (LVSD), which are determined to be class I indication for surgery in the current ACC/AHA guideline. One hundred and fifty-five patients (23.7%) had atial fibrillation and 137 patients (20.9%) had pulmonary hypertension (> 50mmHg right ventricle pressure), which are determined to be class II indication. The mean follow-up period was 6.6±4.9 years.

RESULTS: Thirty-day mortality was 1.1%. The overall survival rate at 5-year and 10-year was 95.4% and 88.6%, respectively. On multivariate analysis, the significant risk factors for late death were age, preoperative NYHA functional class, preoperative atrial fibrillation, preoperative tricuspid regurgitation grade and preoperative pulmonary hypertension. Preoperative LVEF and LVSD were not risk factors for long-term survival.

CONCLUSIONS: Early surgical intervention would be advocated to avoid atrial fibrillation, progression of tricuspid regurgitation and pulmonary hypertension. They should be stressed more in considering the timing for mitral valve surgery.

O3-3

MITRAL VALVE REPAIR WITH LOOP TECHNIQUE

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From 2008 April to 2012 November, we performed mitral valve repair with loop technique in 156 patients; posterior leaflet prolapse (n = 80), anterior leaflet prolapse (n = 41), bileaflet prolapse (n = 30, 4 cases of Barlow's disease). The cause for the MR was degenerative in 90%, and healed IE in 5%. The loop-set with 2 or 3 loops of ePTFE suture was made using a work-bench (Shibata Chorda System: GEISTER). The length of the loops was measured and decided intraoperatively. The reference length of the loops was the length of the adjacent normal chorda. The length of the loops was from 15 to 24mm. The loop-set was fixed to the corresponding papillary muscle. The number of the loops ranges form 2 to 9. The additional technique to accomplish repair was as followed. If the loop was short, we extended the loop with additional ePTFE chorda (loop in loop technique). Height reduction for the posterior leaflet is the method for avoiding the SAM. The redundant P2 segment was removed in a spindle shape parallel to the mitral annulus, and the defect of the leaflet was closed with running suture. This technique was applied if the height of P2 segment longer than 25mm. Patch augmentation of the posterior leaflet with autologous pericardial patch was applied for the enlargement of the coarptation area if the posterior laeftlet was too small. Edge to edge suture was sometimes required for the prolapse of the commissural area. Using these additional techniques, we can applied loop technique repair for all types of the mitral valve prolapse. Actually, we have no case to need conversion from mitral repair to mitral valve replacement. Postoperative mitral regurgitation was less than mild in 89% of the patients early after surgery.

O3-4

PAPILLARY MUSCLE SANDWICH PLASTY AS THE CONCOMITANT PROCEDURE FOR ORGANIC MITRAL VALVE REGURGITATION

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Objective. An original papillary muscle heads approximation procedure, commonly known as Sandwich plasty has been successfully used for the treatment of functional mitral regurgitation (MR) associated with ischemic cardiomyopathy (ICM) and aortic valve disease (AVD). In this study, we evaluated the availability of this procedure for the plasty of Organic MR in comparison with the operative results in patients with Functional MR.

Methods. Forty-eight patients who underwent Sandwich Plasty were reviewed, including 43 Functional MR (27 ICM and 16 AVD) patients and five Organic MR patients. The mean age of all patients was 67 years. In Organic MR patients, predominant cardiac diseases were solitary MR in three patients and combined valve diseases including aortic valve stenosis in two. Mitral valve changes were prolapse in three patients and moderate cusp thickening with calcification in two. Sandwich plasty was concomitantly performed in addition to the mitral cusp plasty associated with just-sized ring-annuloplasty or aortic valve replacement (AVR). The anterior and the posterior papillary muscles were approximated with two Tefron-pledgeted 3-0 Ticron sutures, which required additional 10-20 minutes.

Results. Prominent MR was detected in a patient with Functional MR after surgery. The tenting height (coaptation distance) of mitral valve significantly decreased after surgery from 10.2±0.3 to 6±0.5mm in Organic MR patients, which was similar to the results in Functional MR patients (from 12±2 to 6.8±1.5mm). In Organic MR patients, left ventricle diastolic diameter significantly decreased from 51±3 to 43±3mm and the mean mitral orifice area was 4.3±0.1cm2 without stenosis.

Conclusions. Sandwich plasty reduces the tethering and achieves the coaptation of two leaflets. This procedure is effective as the concomitant procedure in the treatment of organic mitral regurgitation. However, further experiences are necessary to establish the indication of this procedure for organic MR.

O3-5

MID TERM RESULTS OF MITRAL VALVE REPAIR FOR RHEUMATIC MITRAL STENOSIS

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Background: Mitral valve repair for rheumatic mitral stenosis (rMS) is challenging and controversial. We introduced new techniques repairing rMS which has thickened leaflets, severe chordal fusion or shortening with calcification. We report the mid-term results of rMS repair .

Method: Between 2005 and November 2012, we performed 1125 mitral valve surgeries. There were 60 patients (48%) whose mitral valve was successfully repaired within 125 mitral valve surgeries for rMS in this period. Mean age was 64.1±10.8 year old and 43 (71%) were female. Preoperative echocardiogram showed mitral valve area (MVA) of 1.45±0.48cm2 and mean pressure gradient (mPG) of 6.9±3.4mmHg. Details of surgical maneuver were open mitral commissurotomy in 58 patients (97%), aggressive papillotomy and chordotomy in 26 patients (43%), posterior mitral leaflet augmentation with autologous pericardium in 21 patients (35%), anterior mitral leaflet (AML) thinning by peeling off the thickened intima in 20 patients (33%), and other procedures to control mitral regurgitation.

Results: There was no early death. During follow-up period (median 26.5months, range 1-73 months), there were two late mortalities due to pneumonia and sepsis. Two reoperations were performed: redo-MVR at 2 years for recurrent MS due to the thickened fresh autologous pericardial patch and another redo-MVR for recurrent MR due to detachment of transferred chord . Freedom from reoperation at 5 years was 93.6%. Postoperative echocardiogram showed MVA of 1.93±0.34cm2 ($P<0.001$) and mPG of 5.6±1.8mmHg ($P=0.09$). After introducing AML thinning technique in 2011, repair rate of rMS improved from 44 to 66% ($P<0.05$), although postoperative MVA did not change significantly (1.91cm2 vs. 1.94cm2, n.s.).

Conclusion:

Mitral valve repair for rMS is still challenging, although introduction of AML thinning technique contributed to improve the flexibility of not only the AML but also AML complex including subvalvular apparatus which lead to improve the repair rate of rMS.

O3-6

MITRAL VALVE REPAIR IN A CASE OF DEXTROCARDIA WITH SITUS SOLITUS

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(Objective)
Cardiac surgery in patients with positional anomaly of the heart is rare, and technically challenging. Dextrocardia is one of those anomalies, and reports are seldom found about cardiac surgery in such condition. We recently experienced a mitral valve repair in a case of dextrocardia with situs solitus. We describe the detail about the operation and show some images.

(Methods)
A 53-years-old woman was referred to our hospital with a diagnosis of severe mitral regurgitation. She was also diagnosed dextrocardia in her childhood. A mitral valve repair was planned.

(Result)
The operation was performed via a median full sternotomy and bilateral inguinal incisions. The CPB was established by cannulating bilateral femoral arteries and right femoral vein. Through left-sided left atriotomy, torn chordae were found in posterior mitral leaflet. Artificial chordae reconstruction and ring annuloplasty were performed. All intracardiac procedures were made by a surgeon who stood on the left side of the operating table.
The patient recovered steadily, with no mitral regurgitation.

(Conclusion)
We experienced a successful mitral repair in a case of dextrocardia with situs solitus. A median full sternotomy and a left-sided left atriotomy provide excellent operative view of mitral valve.

O3-7

HOW CAN WE ESTIMATE LEFT VENTRICULAR STROKE WORK IN FUNCTIONAL MITRAL REGURGITATION? - AS A PREDICTOR FOR SURVIVAL AFTER MITRAL REPAIR -

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Objectives: The indication of mitral valve repair for patients with severe contractile dysfunction is controversial. We still do not have any reliable predicting parameters for detecting a responder to mitral valve repair for such patients. The purpose of this study is to examine which of the two stroke work indices (SWI) can reliably predict survival after mitral valve repair.

Methods: Subjects were consecutive 17 patients with idiopathic dilated cardiomyopathy and severe mitral regurgitation (MR). They all had medically refractory congestive heart failure symptoms preoperatively. By using transthoracic echocardiography, total SWI-1 was calculated as follows: [SBP x fSV+ left atrial pressure (LAP) x regurgitant volume (RV)] / BSA. Total SWI-2, which was newly developed based on the concept of pressure-volume loop, was calculated as follows: [(SBP - LAP) x (fSV + RV)] / BSA. LAP was estimated by continuous-wave Doppler of MR jet. They all underwent mitral complex reconstruction. Receiver operating characteristic curve was used to determine which index can most predict 1-year survival after operation.

Results: There were 5 (29%) hospital deaths. Overall survival rate was 65% after 6 months and 58% 1 year after operation. Total SWI-2 reliably predicted 1-year survival after surgery (AUC, 0.929; $p = 0.023$), while total SWI-1 did not ($p = 0.06$). The cut-off value of 3755 ml mmHg/m2 for total SWI-2 predicted survivor with high sensitivity (100%) and specificity (71%).

Conclusions: A newly developed total SWI, based on the concept of pressure-volume loop, well predicts survivor after mitral valve repair in end-stage heart failure patients with severe MR.

O3-8

EARLY AND MIDTERM HEMODYNAMICS AFTER SMALL MITRAL BIOPROSTHESIS VALVE REPLACEMENT

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Objective:Patient-prosthesis mismatch (PPM) after mitral valve replacement is controversial. The purpose of this study is to assess early and midterm hemodynamics after small mitral bioprosthesis valve replacement.

Methods: From June 2002 to May 2012, 30 patients underwent mitral valve replacement using small size bioprosthesis (Carpentier Edwards Perimount valve 25) in our hospital.The mean age was 74.8±6.2 years (60-84). Ten (33%) were men.

Results: The etiology of mitral valve disease was as follows, rheumatic(n=11), degenerative(n=9), active IE(n=6), ischemic(n=2), SVD(n=1), and PVL(n=1).

Among them, five patients(15%) received emergent surgery. Redo surgery was performed 6 patients(18%), previous procedure was MVR(n=2), MVP(n=2), and commissurotomy(n=2). Isolated MVR was performed only 7 patients(21%).

Concomitant procedures were TAP(n=11), CABG(n=6), AVR(n=5), and ASD closure(n=2). The mean predicted EOAi was 1.26±0.14(referrd EOA of CEP25 was 1.8). Nine patients were defined as PPM with an EOAi less than 1.2 cm^2/m^2. Thirty-day mortality was 3%(n=1). Overall survival at 2 years was 85.6±6.7%. There was no significant difference between early and midterm echocardiographic date, mPG(4.5 vs. 4.6, P=0.56), pPG(11.8 vs. 11.5, P=0.40), PHT(81.6 vs. 113.1, P=0.99), and calculated PAP(34.6 vs. 35.2, P=0.61).

Conclusions: In this study, early and midterm hemodynamics after mitral valve replacement using small size bioprosthesis was satisfactory. We needed to select small size bioprosthesis for rheumatic small annulus, redo mitral surgery, and concomitant AVR. In our country, many people had small BSA, so mitral valve replacement using small size bioprosthesis was acceptable.

O3-9

REPAIRING FUNCTIONAL MITRAL REGURGITATION BY HEART-TEAM IN THE ERA OF MCLIP

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Objective

In the treatment of functional mitral regurgitation (FMR), MitraClip is drawing attention. Surgeons' efforts should be directed to improve not only FMR but also LV function and geometry of leaflets especially posterior leaflet (PL). Quality enhancement by heart-team work is also important. In this study we reviewed our efforts from the above viewpoints.

Methods

Twenty-one patients with functional MR (6 ischemic), who underwent "papillary head optimization (PHO)" surgery (PHO-Group) were compared with 10 patients (3 ischemic) who underwent papillary muscle approximation (PMA) (PMA-Group). The PHO technique is as follows; for each PM, the PL head is connected to the anterior leaflet (AL) head by using a PTFE suture, and then its arms were passed through mid-anterior mitral annulus. After mitral annuloplasty by using a ring, the sutures were tied after empirical length adjustment. When time permits, the PTFE sutures were put through subaortic curtain to outside, and tension/length was adjusted by echo-guidance in beating condition after coming off pump (heart-team work). As an index of leaflet tethering, angle between the annular plane and AL or PL was measured.

Results

MR significantly decreased to near zero level in both groups ($p<0.001$). AL angle decreased from 43±10° to 26±8 in PHO-Group ($p<0.001$) while from 34±6° to 26±12 in PMA-Group. Interestingly, PL angle improved from 67±12° to 46±25 in PHO-Group ($p=0.088$) while worsened from 54±15° to 114±18 in PMA-Group ($p<0.001$). Transmitral blood flow in PHO-Group was closer to 90°. LVDd improved from 65±9 to 59±8 ($p=0.002$) in PHO-Group while 69±11 to 64±10 ($p<0.001$) in PMA-Group. Echo-guided adjustment of the PTFE sutures gave accurate and reproducible geometry of leaflets.

Conclusion

"Papillary Heads Optimization" may alleviate both anterior and posterior leaflet tethering and improve LV function postoperatively in patients with FMR. Heart-team work for fine adjustment of the PTFE sutures may enhance the results.

O4-1

LONG TERM RESULTS OF CABG WITH BILATERAL INTERNAL THORACIC ARTERY CONPOSITE-Y GRAFTS

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Revascularization with arterial grafts including internal thoracic arteries in coronary artery bypass grafting (CABG) has been reported to improve long-term prognosis, but there are several graft designs. We have created a composite-Y graft using bilateral internal thoracic arteries (BITA), and adopted a design to cover the left coronary artery system. In this paper, we verified long-term results (for more than 10 years) of CABG using a composite-Y graft. The study involved 158 patients (mean age 63.1 ± 9.4 years) with composite-Y grafts using BITA in CABG alone among 376 undergoing CABG between August 1996 and July 2001 at our hospital. The mean follow-up period was 87.1 ± 56.5 months (a maximum of 166 months). These 158 patients were divided into a group with reconstruction of LAD and LCX using composite-Y grafts (L+C group) and a group with reconstruction of LAD only (LCX was reconstructed with another graft) (L group), in order to analyze the two groups' cumulative survival rates. Long-term results in 129 patients of the L+C group and 29 of the L group were as follows. Cumulative survival rates: the L+C group, 95.0% for 2 years, 88.5% for 6 years, and 78.3% for 10 years; the L group, 100% for 2 years, 89.7% for 6 years, and 89.7% for 10 years, with no significant difference between the two groups (logrank test: p ±0.2446). The CABG patients with composite-Y grafts using BITA had good long-term results and covering the left coronary artery system with composite-Y grafts did not influence the occurrence of cardiac events due to insufficient blood flow.

♥ O4-2

TOTAL ARTERIAL REVASCULARIZATION CONFERS SURVIVAL BENEFITS IN PATIENTS WITH MULTI-VESSEL CORONARY DISEASE UNDERGOING OFF-PUMP CORONARY ARTERY BYPASS GRAFTING

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OBJECTIVE

Potential benefits of using arterial grafts as second or third conduits during coronary artery bypass grafting (CABG) are still debated.

METHODS

We reviewed a total of 2113 consecutive patients who underwent elective isolated off-pump coronary bypassing surgery (OPCAB) due to multi-vessel coronary disease. Of them, 869 patietns underwent total arterial revascularization (Artery group) whereas 1244 patietns underwent conventional CABG using venous grafts (Vein group). Long-term survival was compared between the two groups after adjustment using inverse propensity weighting models.

RESULTS

30-, 60-, 90-day mortality rates were 0.9%, 1.2% and 1.5%, and these rates were significantly lower with the Artery group than the Vein group (P=0.030, 0.048 and 0.031, respectively). Follow-up was complete in 2104 patients (99.6%), and 325 deaths (15.1) occurred during follow-up (10470.9 patient-years). 10-year survival rates were 75.4±2.0% in the Artery group and 64.6±4.0% in the Vein group (P=0.004). After adjustment, Artery group patients showed superior survival compared to those in the Vein group (HR, 0.75; 95% CI, 0.60-0.94; P=0.0118). In subgroup analyses, survival benefit by the total arterial grating was observed in most risk subgroups, however, the benefit was revealed significant in patients aged less than 70 years (HR, 0.68; 95% CI, 0.48-0.96; P=0.028) and those with three-vessel disease (HR, 0.73; 95% CI, 0.54-0.98; P=0.039).

CONCLUSIONS

In patients undergoing OPCAB for multi-vessel coronary diseases, total arterial revascularization conferred both short- and long-term survival benefits compared with conventional strategy using venous grafts.

♥ : Travel Grant

O4-3

THE PATENCY OF SEQUENTIAL AND INDIVIDUAL VEIN CORONARY BYPASS GRAFTS: A SYSTEMATIC REVIEW

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Objective: Saphenous vein grafts continue to be the backbone of daily coronary revascularization practice, but controversy still exists about whether to use them as individual or sequential graft. We undertook a systematic review and meta-analysis of cohort studies to compare the mid-term or long-term patency of sequential vein coronary bypass grafts with those of single ones.

Methods: A comprehensive search strategy was run in PUBMED, EMBASE, the Cochrane Library and Chinese Biomedical Literature Database. Inclusion criteria were: (1) two cohorts of patients received sequential and single saphenous vein coronary bypass grafting respectively; (2) prospective or retrospective cohort design; (3) graft patency examined by angiography or ultrafast CT. Two researchers independently performed the literature search, data extraction and quality assessment.

Results: We identified 1,385 titles, reviewed 38 articles for inclusion criteria, and included 12 studies in the meta-analysis. The risk of occlusion in sequential grafts was lower (risk ratio (RR) = 0.67, 95% confidence interval (CI) 0.60-0.74) than that in single grafts. The risk of occlusion in side-to-side anastomoses was lower (RR = 0.52, 95% CI 0.34-0.80) than that of end-to-side anastomoses for sequential vein grafts. There was no difference in occlusion between the distal end-to-side anastomoses of sequential vein grafts and those of single ones (RR = 0.85, 95% CI 0.68-1.06).

Conclusions: The mid-term and long-term patency of sequential vein grafts appears to be better than that of single vein grafts and the patency of side-to-side anastomoses appears to be better than that of end-to-side anastomoses for sequential vein grafts.

O4-4

5 YEAR ANALYSIS OF PATIENTS USING RADIAL ARTERY AS SECOND CONDUIT FOR CORONARY ARTERY BYPASS SURGERY

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Objective:

The use of arterial graft in coronary artery bypass surgery (CABG) is based on excellent patency of the left internal thoracic artery (LITA). Due to the long term patency of LITA surgeons explore the possibility of using other arterial conduit with the expectation of better patency compared to conventional vein graphs. Radial artery (RA) graph as a choice of conduit was not initially well taken due to the potential spasms after implantation. However, Buxton et al and others in the last 15 years managed to overcome the spasmogenicity and shown good long term patency. This study aim to investigate and compare the 5 year mortality rate and mid-term survival of patients that use RA compared to saphenous vein (SVG) only as a second conduit for CABG.

Methods:

The study group involves isolated CABG surgery that uses both RA and SVG graph ranging from 2005-2010 from a single center -- RSJ harapan kita hospital and single surgeon. In total a group of 521 patients underwent isolated primary multi-vessel coronary surgery. Among these, 246 (47%) received at least 1 radial artery graft in the procedure. The remaining 275 (53%) received LITA and veins grafts only. We then contact them individually to ask for mortality, stroke, redo, hemodialisis and new Myocardial Infarct (MI) incidences as poor prognostic factors in this study. Categorical variables were expressed as frequencies and compared using the Fisher exact and chi-squared tests. Continuous variables were expressed as mean ± standard deviation and compared using the unpaired t-test. Kaplan-Meier method was used to analyse survival.

Results:

There is no major difference from our statistical analysis between the choice of RA and SVG as a second conduit in regards of poor prognostic factors.

Conclusions:

Patients that use RA as a second conduit not disadvantaged in early outcomes or mid-term survival.

O4-5

EFFICACY OF ENDOSCOPIC VEIN HARVEST FOR CORONARY ARTERY BYPASS GRAFTING

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BACKGROUND: While open saphenous vein harvest was related to postoperative wound complications, endoscopic saphenous vein harvest (EVH) was developed to minimize the morbidity in the saphenous vein harvest procedure. We analyzed wound complications and early patency of conduits using EVH.

METHODS: From January 2009 to April 2012, 162 patients underwent isolated coronary artery bypass grafting. In these patients, 119 patients underwent CABG using saphenous vein graft. 115 patients received EVH procedure, while another 4 patients did not. We performed EVH using VirtuoSaph (Termo) in 112 cases and VASOVIEW (MAQUET) in 3 cases. Coronary angiography was performed 1 week after CABG in all cases.

RESULTS: The patient population included 26 females and 89 males. Average patient's age was 68.7 years old. There is no patient who needed to conversion into open harvesting. 108 patients underwent CABG using off-pump procedure. 23 cases were emergency cases. A mean of 3.8 grafts and a mean of 1.3 SVGs were placed per patient. A total of 146 saphenous vein grafts were assessed for patency. Saphenous vein patency in early follow up was 90.4%. Over all graft patency was 95.4%. Post-operative wound complication occurred in only 1 case (0.8%). The patient was inserted a drain into tunnel of the wound at operation and removed 5 days after operation. His wound infection occurred 7 days after operation. We needed antibiotic therapy and V.A.C therapy for 3 weeks.

CONCLUSION: The use of EVH reduced wound complications associated with saphenous vein harvesting. EVH did not increase graft failure risk.

O4-6

THE ENHANCED HEMODYNAMIC FLOW OF SEQUENTIAL CORONARY ARTERIAL BYPASS GRAFTING OCCURRING WITH INCREASING ANASTOMOSIS PER GRAFT CONFERS A BENEFICIAL INFLUENCE ON GRAFT PATENCY

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Objectives : This study aimed to assess the impact of the number of distal anastomosis on the hemodynamic flow characteristics and graft patency in aorta-saphenous vein sequential coronary bypass grafts.

Methods : From March 2007 to March 2011, 276 patients (211 males, 76.4%) receiving aorta- saphenous vein sequential bypass grafting for multi-vessel coronary artery disease were prospectively enrolled. All patients underwent left internal thoracic artery-to-left anterior descending coronary artery bypassing. Single, double, triple, and greater than triple saphenous vein sequential bypasses were performed to non LAD targets in 7, 179, 73, and 7 patients, respectively. All patients underwent intra-operative Transit time flow meter (TTFM) measurements. Graft patency was assessed with dual source CT imaging during the follow up.

Results : TTFM measurements showed mean flow increases and pulsatility index decreases with increasing number of sequential bypass anastomosis (Fig 1). Coronary CT angiogram was available in 530 (85.3%) of the 621 distal anastomoses performed over a median follow-up duration of 198 days (interquartile range: 88-302 days). There were 2 occlusions in the single, 14 in double and 3 in triple or more sequential bypass grafts. The patency rate during the follow-up in decreasing order was more than triple, triple, double, and single bypass grafts (fig 2).

Conclusion : The study showed a positive correlation between the patency, number of distal sequential anastomosis, and the mean flow. Subsequently, the enhanced patency of sequential saphenous vein bypass grafts was deduced to be attributable to increases in the number of distal anastomosis and the resultant enhancement in hemodynamic flow characteristics.

O5-1

LONG-TERM RESULTS OF A SIMPLIFIED TECHNIQUE TO IMPROVE REVASCULARIZATION OF DIFFUSELY DISEASED LAD

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OBJECTIVE Patients undergoing CABG often have advanced diffuse coronary artery disease. Complete revascularization is desirable with regard to treatment of angina and long-term survival. Coronary endarterectomies are associated with a high incidence of myocardial infarction. In contrast, Barra reported reconstruction of long segments of the LAD with LITA employing plaque exclusion to be associated with a low incidence of myocardial infarction, excellent graft patency and good long-term results. However, this method appears technically demanding with cross-clamp times averaging two hours. Here we report long-term experience with a simplified approach to improve revascularization of diffusely calcified LAD.

METHODS Fifty-six patients were operated with extended LAD-LITA anastomoses without plaque exlusion (XA-group) because of diffusely diseased LAD. The objective was to improve run-off distally and proximally while maintaining the integrity of the vessel intima. These patients were compared with controls undergoing conventional CABG (n=110) matched for age, time of surgery, number of distal anastomoses and surgeon. Follow-up averaged 6 years.

RESULTS In the XA-group v control group mean age was 63 ± 10 v 64 ± 9 years and EuroSCORE was 3.8 ± 2.8 v 4.0 ± 2.9. Cross-clamp time averaged 66 ± 18 v 61 ± 24 minutes while 4.1 ± 1.0 v 3.9 ± 1.0 bypasses and their corresponding central anastomoses were performed. Perioperative myocardial infarction was found in 5.5% v 4.6%. 30-day mortality was zero in both groups. Cumulative five-year survival was 96.4% v 91.8%. At follow-up 70% v 62% of the patients never used short acting nitrates whereas 15% v 11% used them more than once weekly. None of the LITA grafts examined by angiography in patients with recurrent angina had closed.

CONCLUSIONS Simplified long-segment reconstruction of diffusely diseased LAD with extended LITA-LAD anastomoses without plaque exclusion produced clinical results comparable with those found after CABG in routine patients.

O5-2

MULTIVESSEL, TOTAL ARTERIAL, OFFPUMP CORONARY ARTERY BYPASS SURGERY THROUGH LEFT ANTERIOR THORACOTOMY

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Objective: Thin built individuals with good LV function and good coronary targets are at an added advantage for CABG. We evaluated 70 such selected patients who underwent, multi-vessel total arterial off pump CABG through left anterior thoracotomy.

Methods: The procedure was performed using 5-8 cm left anterior thoracotomy incision. LITA harvested in every patient, RITA or radial artery used as second conduit. LITA and RITA or LITA and Radial 'Y' was made to accomplish multivessel total arterial bypass grafting. In one patient Saphenous vein was used to graft LAD and LITA used to graft diagonal as LITA length was not adequate.

Results: Multivessel, total arterial CABG was accomplished in all selected individuals. There was no mortality, no re-exploration for bleeding and no wound dehiscence or wound infection. RITA was harvested in long standing diabetic patients with no concern for sternal wound healing. One patient was converted to formal sternotomy and CPB for unstable haemodynamics. Muscle healing of anterolateral thoracotomy is faster as compared to bone healing of conventional sternotomy incision and patients were back to normal life earlier.

Conclusions: With available formal stabilizers and conventional instruments multivessel, total arterial off pump CABG can be accomplished in selected individuals safely. RITA can be harvested thro left thoracotomy. In long standing diabetics, immunosupressed, patients on steroids LITA & RITA can be used with no concern for sternal dehiscence and wound healing . Muscle healing of thoracotomy is faster as compared to bone healing of conventional sternotomy incision and patients are back to normal life earlier. Also we found this approach good for patients who are waiting to undergo renal transplant, oncosurgery in immediate post-op period versus PCI in such patients. MIDCAB can be salvage procedure for TECAB. So if we have to do TECABS tomorrow we have to do MIDCABS today.

O5-3

CORONARY ARETRY BYPASS GRAFTING FOR YOUNG ADULT PATIENTS ASSOCIATED WITH KAWASAKI CORONARY DISEASE

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Objective

The indication of coronary revascularization for young adult patients associated with Kawasaki coronary disease has not been established. Since coronary artery aneurysms get involved with calcified changes several years later, routine PCI procedures except for rotational ablation could not be applied. Therefore, CABG plays an important role in Kawasaki coronary disease compared to usual atherosclerotic coronary disease. The long-term outcome of surgical revascularization for young adult patients associated with Kawasaki coronary disease was assessed in our institute.

Methods

Our surgical strategy is (1) to use only arterial grafts (no venous graft) and (2) to use bilateral internal thoracic artery (ITA) whenever feasible. Seven young adult patients aged from 20 to 37 (29.3±5.3) years undergoing CABG from 1994 to 2010 were followed up for 2 to 19 (7.8±5.4) years. Six patients involved CTO lesions (5 in LAD and 5 in RCA) and one patient had LMT stenosis. The number of distal anastomoses was 2.4±0.5. The left ITA, the right ITA, and the right gastroepiploic artery were used in 6, 7, and 1, respectively, and no saphenous vein was used.

Results

There were no operative or hospital death, and no late death and no cardiac event occurred during follow-up period. The graft patency was confirmed in all and no PCI was needed postoperatively.

Conclusions

The long-term outcome of CABG using only arterial grafts for young adult patients associated with Kawasaki coronary disease was satisfactory.

O5-4

CABG VERSUS PCI FOR LEFT MAIN CORONARY ARTERY DISEASE

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Background: CABG is the gold-standard intervention for left main (LM) coronary artery disease. However, development in PCI led to the modification of Guidelines by 2010 ECS/EACTS and 2011 ACCF/AHA. We herein reviewed outcomes of a consecutive series of patients undergoing primary intervention for LM disease in the Heart Center in the last 2 years.

Methods and Results: The cohort included 51 patients treated by CABG and 38 by PCI. Basic characteristics or Logistic EuroSCORE (7.5±10 versus 5.0±4.3) were not significantly different between the CABG and the PCI groups, whereas the number of diseased coronary arteries was significantly greater in the CABG group (2.6±0.6) than that in the PCI group (1.8±0.8, P <0.0001). In contrast, SYNTAX Score was not significantly different between them (34±13 versus 31±10). CABG achieved complete revascularization in all patients, while staged PCI was performed in 11 patients having multiple coronary artery disease. MACCE post-intervention until the latest follow-up included one in-hospital mortality and one PCI for graft failure in the CABG group, and 3 PCI for in-stent restenosis in the PCI group.

Conclusion: The interventional strategy for LM disease was essentially determined by the number of diseased coronary arteries in the Heart Center, producing favourable outcomes. Approach by the team involving surgeons and cardiologists would be important in treating LM disease, though long-term follow-up is warranted.

O5-5

ISOLATED CORONARY ARTERY BYPASS GRAFT PATIENTS IN QATAR: HIGH INCIDENCE OF DIABETES MELLITUS AND LEFT MAIN STEM CORONARY ARTERY DISEASE

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Objective:
Left main (LM) coronary artery disease is a potentially life-threatening condition. Our coronary artery bypass graft (CABG) patients seemed to be young with severe lesions. We studied our isolated CABG patients' demographics, rate of diabetes, ventricular function and severity of LM disease.

Methods:
Data were collected from isolated CABG patients (September 2011 until October 2012) at the new Heart Centre in Qatar. Data were derived from theatre logs, 'Dendrite' surgical database and the Hospital Information System. Angiographic data were analysed by surgeons/cardiologists. A standard statistical package (SPSS) was used for analysis.

Results:
27% of the isolated CABG patients (62 of 226) had a significant (>50%) LM stenosis . LM patients' median age was 57 years (84% male), compared to 56 years for other CABG patients (93% males). 52% of LM patients were of Indian Subcontinent origin (median age 53), compared to 67% for the other CABG patients (median age 55).
63% of LM patients had diabetes mellitus compared to 67% for other CABG patients. The Glycosylated Haemaglobin median value was 7.7 for the LM patients and 7.9 for the other CABG group.
In the LM group the ejection fractions were 61% good, 29% moderate and 10% poor. In the other CABG group 59% good, 33% moderate and 10% poor.
The severity of the LM stenoses were 30% for 50-60% lesions, 44% for 61-80% lesions and 26% for 81-100% lesions.

Conclusions:
The isolated CABG population in Qatar is young with a very high rate of diabetes mellitus (66%) that is poorly controlled, with 60% having good ventricular function. 27% of our isolated CABG population had significant LM stenoses with a quarter of these having very severe lesions (80%+ stenosis).
Screening for diabetes and greater diabetic control at a younger age may have a beneficial impact in our population group.

O5-6

EMERGENT CORONARY ARTERY BYPASS GRAFTING FOR LEFT ANTERIOR DESCENDING ARTERY DISSECTION CAUSED BY PERCUTANEOUS CORONARY INTERVENTION

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Background: Left anterior descending artery dissection (LADD) during percutaneous coronary intervention (PCI) is a serious complication and emergent coronary artery bypass grafting (CABG) is required in most occasions. This is a report of 3 cases who underwent successful emergent CABG for LADD caused by PCI, and surgical strategies were described.
Patients: Case 1 was a 78 year-old male with LADD during PCI and transferred to our hospital under intra-aortic balloon pump (IABP) support. Emergent off-pump CABG (OPCAB) was performed. True lumen in the LAD was occluded with thrombus and the false lumen was the source of blood supply. Left internal thoracic artery (LITA) was anastomosed to this false lumen, and postoperative angiography showed LITA was well-patent. Case 2 was a 73 year-old female with 2-vessel disease (RCA, LCx), who had a past history of descending aortic replacement with Homograft for aortoesophageal fistula with esophagus reconstruction anterior to the sternum. PCI was carried out, and she got LADD with total occlusion when a guiding wire was inserted into the LCx. An IABP was immediately inserted and emergent OPCAB was successfully performed through left thoracotomy because of the esophagus position. Case 3 was 79 year-old female, had received a series of PCI procedures for 3-vessel disease. The patient got LADD during balloon plasty, and she was transferred to our hospital under IABP support, with guiding wire left in the true lumen of LAD and LCx. Stent insertion was further tried, however, the oozing rupture emerged in the LAD. Emergent surgery for hemostasis and OPCAB for the residual lesions were indicated. The guiding wires were effective in identifying the appropriate lumens for anastomosis, and those wires were removed after the anastomoses were completed.
Conclusion: Timing of surgery and strategy for appropriate revascularization was crucial to obtain successful surgical results in such critical cases.

O6-1

RIGHT MINI-THORACOTOMY APPROACH FOR ISOLATED AORTIC VALVE REPLACEMENT WITH TOTAL CENTRAL CANNULATION: THE NEW STANDARD

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Objective. Minimally invasive surgical techniques have been developed for treating many cardiac diseases. Minimally Invasive Aortic Valve Replacement (MIAVR) through a right mini-thoracotomy is not widespread because it is limited by the very tiny operating field, the need for a peripherical cannulation and the longer cardiopulmonary bypass time compared to the standard approach. The purpose of this study is to review our initial experience with MIAVR through a right mini-thoracotomy with total central cannulation.

Methods. Between January 2010 and November 2012 105 patients underwent MIAVR through a 4 to 6 cm skin incision at the third intercostal space without rib resection. In the last 59 consecutive patients, mean age 72.7 ± 10.3 years, the cardiopulmonary bypass was instituted through the same surgical access. The aortic cross clamp has been placed trancutaneously just above the main skin incision and cold blood antegrade cardioplegia has been used in all cases.

Results. All patients received an isolated aortic valve replacement with a median prosthesis size of 25 mm. Mean cardiopulmonary bypass time and cross-clamp time were respectively 65.5 ± 14.5 min and 51.9 ± 12.2 min. Skin-to-skin time was 188.7 ± 38.4 minutes. Median post-operative ventilation time was 7 hours and intensive care and hospital stay were respectively 1.8 days and 8 days. No deaths have been recorded. One patient has been revised for wound complication and in one case a pacemaker implantation was needed for complete atrio-ventricular block.

Conclusions. Our initial experience confirms that MIAVR achieved through a right mini-thoracotomy with central cannulation is safe and it can be easily performed without increasing the surgical time if compared with the standard full sternotomy approach at our department and avoiding groin incisions. The advantages of this technique include early mobilization and rehabilitation, excellent aesthetic result and lower risk of wound complications.

O6-2

EARLY EXPERIENCE WITH PERCEVAL S SUTURELESS BIOPROSTHESES IN PATIENTS UNDERGOING MINIMALLY INVASIVE AORTIC VALVE REPLACEMENT VIA RIGHT ANTERIOR MINITHORACOTOMY

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OBJECTIVE: To evaluate the postoperative outcomes of Perceval S sutureless bioprostesis in patients undergoing minimally invasive aortic valve replacement (MIAVR) through right anterior minitoracotomy (RT).

METHODS: From March 2011 to September 2012, 94 consecutive patients (mean age 77.2±6.5 years) underwent MIAVR through RT with Perceval S sutureless bioprostheses. RT was performed through a skin incision of 5-7 cm placed on the 2nd intercostal space. Direct aortic and percutaneous femoral cannulation were routinely used.

RESULTS:
In-hospital mortality was 0% with a median predicted EuroSCORE of 9% (range 5%-30%). The mean aortic cross-clamp and cardiopulmonary bypass times were 42.7±13 and 72.5 ± 23 minutes, respectively. Median intensive care unit stay was 1 day (range 1-2 days) and patients were discharged after 6 (range 4-14) days. Stroke occurred in 1 patient. Incidence of permanent pacemaker was 0%. Hemodynamic at discharge showed good function of all Perceval S valves with low transvalvular pressure gradients (mean, 10 ± 4 mm Hg and peak, 21 ± 8 mm Hg). No migration or dislodgement of the valve occurred, but two mild paravalvular leakages were recorded. At median follow-up of 8 months, survival and freedom for reoperation were 100%, respectively.

CONCLUSIONS: In patients undergoing MIAVR through RT, the implantation of Perceval S sutureless bioprosthesis is simple and associated with excellent early clinical and hemodynamic outcomes. RT might be an alternative to TAVI procedures for high risk patients.

O6-3

MINIMALLY INVASIVE AORTIC VALVE REPLACEMENT THROUGH RIGHT MINI-THORACOTOMY

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OBJECTIVE: Recently many cardiac surgeons pay attention to minimally invasive cardiac surgery (MICS); mitral valve surgery or closure of atrial septal defect are commonly performed via right mini-thoracotomy in some Japanese institutes. Whereas, minimally invasive aortic valve replacement thorough the right mini-thoracotomy (MICS AVR) has been performed in only selected institutes. In the present study, we review our experiences with MICS AVR and evaluate the surgical outcomes.

METHODS: From May 2007 to June 2012, 59 patients underwent MICS AVR. The surgical data, perioperative data and clinical outcomes of these patients were compared with those of 178 patients who underwent conventional aortic valve replacement (CAVR) with midline sternotomy during the same period.

RESULTS: There were some significant differences in patients' demographic data between MICS AVR and CAVR groups: mean age, 55±14 vs. 74±11; ratio of aortic stenosis, 34% vs. 79%. Although cardiopulmonary bypass time and aortic cross-clamping time were longer in the MICS AVR group (137±33 min vs. 110±30 min; 95±24 min vs. 80±23 min), there were no significant differences in total operative time between both groups. Regarding to the percentage of blood transfusion requirement, postoperative ventilation time, intensive care unit stay and hospital stay, MICS AVR group had significantly lower outcomes (31% vs. 79%; 3.5±2.0 hr vs. 8.2±16.3 hr; 1.4±0.9 days vs. 2.5±1.6 days; 12.9±0.9 days vs. 19.8±8.4 days, respectively). There were no significant differences in mortality and stroke rate between two groups (1.7% vs. 1.1%; 1.7% vs. 0.6%, respectively).

CONCLUSIONS: This study showed satisfactory outcomes of MICS AVR. We believe this technique is a very feasible surgical option and that MICS AVR can be used for patients with a variety of preoperative backgrounds and more complex cardiovascular disorders in the near future.

O6-4

MINIMALLY INVASIVE AORTIC VALVE REPLACEMENT VIA RIGHT MINITHORACOTOMY IS ASSOCIATED WITH BETTER OUTCOMES COMPARED TO MINISTERNOTOMY

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OBJECTIVE: To compare early outcomes of right minithoracotomy (RT) versus ministernotomy (MS) in patients undergoing minimally invasive aortic valve replacement (MIAVR).

METHODS: From January 2005 to December 2011, a total of 406 patients underwent MIAVR, of whom 251 patients had RT (RT group) and 155 patients had MS (MS group). Cardiopulmonary bypass was achived by direct ascending aortic cannulation and percutaneous venous cannulation.

RESULTS: Overall in-hospital mortality was 1.1% with no difference between two groups (1.2% in RT vs 1% in MS). Patients undergoing MIAVR via RT had lower incidence of postoperative atrial fibrillation (21.3% vs 32.1%, p=0.014), shorter ventilation time (7 [range interquartile [RI] 5-9 vs 7 RI 6-12, p=0.004), intensive care unit (1, RI 1-1 vs 1 RI 1-2, p=0.001) and ward stay (5,RI 4-6 vs 6,RI 5-7, p=0.0001). No difference were found in terms of cardiopulmonary, cross clamping time, postoperative stroke, re-exploration for bleeding, blood transfusion. Discharge home was higher in the RT group (93% vs 70%, p=0.0001).

CONCLUSIONS: Minimally invasive aortic valve replacement via right minithoracotomy is associated with lower postoperative morbidities and shorter hopital stay than ministernotomy.

O6-5

MINIMALLY INVASIVE AORTIC VALVE REPACEMENT THROUGH RIGHT AXILLAR SMALL THORACOTOMY

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Backgroud: Partial sternotomy, parasternal approach, or intercostal approach through fore chest skin incision has traditionally been adopted as less invasive approach for aortic valve replacement. The purpose of this study was to establish cosmetically superior approach for minimally invasive AVR.

Material and Meshod: Between May and October 2012, seventeen patients underwent AVR through right axillar small thoracotomy (TAX-AVR) at our institution. The age of the patients ranged from 60 to 83 (mean 72.2)years old. Eight patients were male. Pre-operative diagnosis was aortic stenosis in 9, regurgitation in 3, and combination of both in 2 patients. Pathology of the lesion was senile AS in 9, congenital bicuspid valve in 3, rheumatic in 2, and degenerative change in 3. Under general anesthesia and differential lung ventilation, the patients were set in partial left lateral position. A vertical skin incision 6 cm in length was made along the right mid axillar line, followed by third or fourth inter-costal thoracotomy. Cardio-pulmonary bypass was established through the right femoral vein and artery. AVR was carried out as usuall through the small thoracotomy under direct or video-scope vision. All sutures were tied with the aid of a knot pusher. Annular patch enlargement was performed in one patient, and mitral valve replacement in another concomitantly.

Results: Average aortic clamp time was 113 (range 84-171), cardio-pulmonary bypass time 160 (116-223), and operative time 261 (194-392) minutes. Eight patients did not need blood transfusion. Transection of ribs or internal thoracic artery was not necessary. There was no in-hospital death with average post-operative hospital stay of 9.4 days. Stroke, wound infection, peri-valvular leak, or excessive bleeding did not occur.

Conclusion: TAX-AVR was time consuming, but a safe alternative with better cosmetic result compared with fore-chest approaches.

O6-6

MINIMALLY INVASIVE STERNAL ACCESS MITRAL VALVE SURGERY; NEW GOLD STANDARD

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Minimally Invasive, Direct, Sternal sparing approach mitral valve surgery: new gold standard.

OBJECTIVE:

Minimally invasive approach for surgical treatment for heart valve disease is not new. Use of totally endoscopic robotic assist approach has been limited by the cost involved. Mitralvalve replacement with minimally invasive technique is our preferred method for last few years. We present our experience of one hundred and eighty cases of mitral valve replacement with minimally invasive, direct approach through a small thoracotomy.

METHODS:

One hundred and eighty partients underwent minimally invasive mitral valve surgery from January 2010 through octl 2012., 91 had predominant mitral stenosis, 63 had predomient mitral regurgitation., 12 had double valve disease (mitral and aortic), 14 had triple valve disease. The surgical approach is through a small (2.5 inches) lateral thoracotomy through the right third /fourth intercostal space. Femoral arterial and venous cannulation is used for cardiopulmonary bypass (CPB).

RESULTS:

The difference in average CPB and aortic cross clamp times are not significantly different as compared to conventional sternotomy approach for any subgroup of procedures. The average intensive care (ICU) stay, hospital stay, and transfusion requirement are significantly less ($p<0.001$ for all parameters for all subgroups). There is no wound infection and mortality in this group.

The cosmetic results and lower loss of man work hours is an extremely important advantage of this approach especially for young female patients.

The cost of the small initial investment of surgical equipment is offset by the short ICU and hospital stay as well as lower transfusion and antibiotic requirement.

CONCLUSION:

The minimally invasive, direct approach for heart valve procedures is safe, reproducible, inexpensive and cosmetically superior. It is the imminent gold standard for both developing and developed nations.

O7-1

TOWARD MORE REFINED PORT-ACCESS SURGERY

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OBJECTIVE: Port-access surgery so far needs many satellite holes for exposure etc. The holes can cause postoperative bleeding and leave scars which compromises pain relief or cosmetic benefits. We review our efforts to minimize the holes.

METHODS: In our experiences of MICS surgery for 160 patients with valvular disease in the past 2 years, we had 50 port-access surgery; 18 patients had "less satellite hole" method and were reviewed.

There were 7 males and mean age was 45 y.o. All patients had mitral regurgitation (MR) preoperatively.

In operation, a skin incision of 6-8cm length was made on the left chest around 4th intercostal space. After pericardiotomy, traction sutures were placed on both pericardial edges and placed out of the chest via the skin incision. A skin protector was applied which spread the traction sutures. Cardiopulmonary bypass was started with arterial cannula in a femoral artery while venous one in a femoral vein and internal jugular vein. Aortic root cannula was inserted via main incision. Ascending Aorta was cross-clamped by Chitwood clamp via a small skin hole which was the only satellite hole. A long blade retractor is placed via main incision to the left atrium. Mitral valve is repaired under the direct vision with video assist. After the repair, a drainage tube was inserted via the Chitwood clamp hole.

RESULTS: There were no hospital death or major complications. Mitral repair was successful in all patients; triangular/quadrangular resection in 9, PTFE new chordae in 9, and annuloplasty in all. There was no reopening for bleeding. Skin scar area was less than 20% compared with conventional multiple hole method. All the patients were satisfied with the operation and wound.

CONCLUSIONS: "Less satellite hole" method where only one satellite hole is left is safe and appreciated by patients.

O7-2

MINIMALLY INVASIVE AORTIC VALVE REPLACEMENT VIA RIGHT MINITHORACOTOMY IS SUPERIOR TO TRANSCATHETER AORTIC VALVE IMPLANTATION IN HIGH RISK PATIENTS: A PROPENSITY MATCHED ANALYSIS

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OBJECTIVE: Minimally invasive aortic valve surgery (MIAVR) has shown excellent results in terms of mortality and morbidities, especially in high risk patients. However, no study compared the effect of MIAVR with transcatheter aortic valve implantation (TAVI). Aim of this study was to compare early outcomes and midterm survival of patients undergoing MIAVR via right thoracotomy versus patients undergoing TAVI.

METHODS:From January 2005 to October 2012, 420 patients underwent either MIAVR via RT (N=336 patients, 80%) or TAVI (N=84, 20%: 44 transapical and 40 transfemoral). Of these, 38 patients undergoing MIAVR via RT were matched to TAVI group by propensity score analysis. Preoperative baseline characteristics were similar in both groups.

RESULTS:Preoperative baseline characteristics were similar in both groups. Overall mortality was 3.9% (median predicted EuroSCORE 12, range interquartile 8-19) with no differences between groups (2.6% in the RT group vs 5.3% in the TAVI group). Seventeen (44.7%) patients in the TAVI group had mild-moderate paravalvular leakage and 1 (2.6%) patient had postoperative stroke. In the RT group, no stroke occurred and only one patient had mild paravalvular leakeage. At a median follow-up of 20 (6-36) months, survival was better in patients undergoing MIAVR through RT compared to those undergoing TAVI (92±6% vs 46±20%,P=0.006).

CONCLUSIONS: MIAVR through RT is associated with better early outcomes and midterm survival compared to TAVI.

O7-3

MINIMALLY INVASIVE STERNAL SPARING DIRECT ACCESS CORONORY ARTERY BYPASS GRAFTING

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MINIMALLY INVASIVE, STERNAL SPARING, DIRECT ACCESS CORONORY ARTERY BY PASS SURGERY

Introduction:

The morbidity of the conventional Coronary artery bypass grafting (CABG) has been the major drawback in competing with other revascularization techniques. Over the last decade, attempts at robotic and endoscopic sternal sparing approaches have met with limited success due to prohibitive cost and lack of reproducibility. We propose the middle path of a direct sternal sparing approach through a small (3.5 inches) left thoracotomy for multi-vessel revascularization and present our experience of 100 cases.

Methods:

Exclusion criteria were ,distal LAD disease,unstable patient and chronic obstructive pulmonary disease. Chest is entered through fourth intercostal space using a 3.5 inch incision. LIMA is dissected under direct vision using specially designed retractors. For CPB assisted patients, femoral artery and vein are cannulated. proximal anastomosis is next constructed under direct vision on the aorta.

Results:

100 patients underwent CABG through a small left thoracotomy between June 2010 and August 2012. 27 had single, 42 had double and 31 had triple vessel disease. Femoral cardio-pulmonary bypass was used in 58 patients and rest had off pump surgery. The men age was 64±6 years. Fifty eight percent were diabetic. The mean number of grafts were 2.4±0.7. The average blood transfusion requirement was 1.1±0.8 units. The mean intensive unit stay was 2.1±1.3 days. The mean hospital stay was 4.5±2.3 days. There were no deaths or wound infection.

Conclusion:

Minimally invasive, sternal sparing direct surgical revascularization combines the benefit of a direct vision good anastomosis with the morbidity of percutaneous intervention. It is safe, reproducible and cost-effective due to shortened intensive care and hospital stay.

O7-4

MINIMALLY INVASIVE STERNAL SPARING DIRECT ACCESS AORTIC VALVE SURGERY

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Minimally Invasive, Direct, Sternal sparing approach for aortic valve surgery.

OBJECTIVE:

Minimally invasive approach for surgical treatment for heart valve disease is not new. Use of totally endoscopic robotic assist approach has been limited by the cost involved.Aortic valve replacement with minimally invasive technique is infrequently used method. We present our experience of one hundred and five cases of Aortic valve valve replacement with minimally invasive, direct approach through a small thoracotomy .

METHODS:

One hundred and five partients underwent minimally invasive heart valve surgery from January 2010 through octl 2012. Of these 105 patients, 71 had predominant aortic stenosis, 23 predomient aortic regurgitation, 9 had double valve replacement (mitral and aortic). The surgical approach is through a small (2.5 inches) lateral thoracotomy through the right third /second intercostal space. Femoral arterial and venous cannulation is used for cardiopulmonary bypass (CPB). Cardioplegia is delivered directly in the aortic root.

RESULTS:

The difference in average CPB and aortic cross clamp times are not significantly different as compared to conventional sternotomy approach for any subgroup of procedures. The average intensive care (ICU) stay, hospital stay, and transfusion requirement are significantly less ($p<0.001$ for all parameters for all subgroups). There is no wound infection and mortality in this group. There are no contraindications for this approach except heavily calcific aortic valve disease .

The cosmetic results and lower loss of man work hours is an extremely important advantage of this approach especially for young female patients.

The cost of the small initial investment of surgical equipment is offset by the short ICU and hospital stay as well as lower transfusion and antibiotic requirement.

CONCLUSION:

The minimally invasive, direct approach for heart valve procedures is safe, reproducible, inexpensive and cosmetically superior. It is the imminent gold standard for both developing and developed nations.

O7-5

VIDEO-ASSISTED CARDIAC SURGERY VIA RIGHT MINI-THORACOTOMY

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BACKGROUND: Cardiac surgery with small incision is receiving global attention from patients and cardiac surgeons. We have constructed a successful minimally invasive cardiac surgery program after 15 years from the start-up in 1998. Currently, for mitral valve surgery, ASD closure and cardiac tumor resection, a video-assisted mini-thoracotomy approach is routinely used with limited exclusion criteria.

METHODS: Consecutive 607 cardiac surgeries via mini-thoracotomy (mitral valve plasty (MVP) 325, mitral valve replacement (MVR) 45, ASD closure 218, cardiac tumor 10, partial ECD repair 5, others 4), performed between August 1998 and November 2012 were reviewed. The mean age was 47.4 ± 15.7 (11 - 83) years. 313 (51.5%) were female patients. In current settings, a mini-thoracotomy was done in the right fourth intercostal space and a high definition video scope was placed at the backside of the mini-thoracotomy through the same inter costal space. CPB was established with femoral artery, femoral vein and right internal jugular vein cannulations. The heart was arrested with ante-grade cold blood cardioplegia under direct cross clamping with a modified Cosgrove flexible clamp. Complementary retrograde cardioplegia is used. For optimal exposure of the mitral valve and other cardiac anatomy, a flexible retractor integrated to a mini-thoracotomy rib retractor.

RESULTS: Aortic cross-clamping time in MVP, MVP and ASD closure were 170.2, 150.0 and 50.7 minutes, respectively. Total perfusion time in MVP, MVP and ASD closure were 254.7, 236.5 and 105.5 minutes, respectively. Conversion to full sternotomy happened in four case (0.66%) due to retrograde aortic dissection, bleeding and severe heart failure. There were three surgical mortalities (0.49%).

CONCLUSIONS: Video-assisted cardiac surgery via right mini-thoracotomy is safe and secure procedure and can be applied as a routine practice.

O7-6

SILENT AND CLINICAL STROKE IN ANTEROGRADE VS. RETROGRADE ARTERIAL PERFUSION - A DIFFUSION-WEIGHTED MAGNETIC RESONANCE IMAGING STUDY

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BACKGROUND:

Compare to median sternotomy, minimally invasive cardiac surgery (MICS) has been considered to show higher stroke rate. The risk of clinical stroke after MICS due to retrograde perfusion has known from 1% to 3%. However, the incidence of clinically silent stroke is unknown but may be even higher.

METHOD

This observational study enrolled 167 patients underwent cardiac surgery since February 2010. Conventional ascending aortic cannulation with anterograde perfusion (group C, n=81) was compared to retrograde perfusion with right femoral artery cannulation (group M, n=86). Preoperative magnetic resonance imaging (MRI), postoperative MRI diffusion-weighted imaging (DWI) and MRI susceptibility-weighted imaging (SWI) were performed. Perioperative clinical data were also collected.

RESULTS:

Operative mortality was 2 in group C and 1 in group M (p>0.1). In preoperative demographics, hypertension, diabetes, renal insufficiency, dyslipidemia, history of stroke, male and elderly patients were more common in group C, but mitral valve surgery, left atrial thrombus and atrial fibrillation was common in group M. There was one symptomatic cerebral infarction and one subdural hemorrhage was developed in group M. The incidence of clinical stroke was comparable (group C; 0/81, group M; 2/86, p>0.1). Among all patients population, silent infarctions were detected in 29.3% (49/167) with small new focal high signal intensity on MRI-DWI and silent microbleeds were shown in 73.7% (123/167) with black signals on MRI-SWI. The incidence of silent infarction was comparable (group C; 28.4%, group M; 30.2%, p>0.1), but microbleeds was frequently detected with retrograde perfusion (group C; 66.7%, group M; 80.2%, p=0.047).

CONCLUSIONS

In this study, the prevalence of obvious stroke and clinically silent stroke on brain MRI was comparable in both anterograde and retrograde perfusion technique. However, the higher incidence of microbleeds needs to be investigated further.

O8-1

EFFICACY AND SAFETY OF TRANS-APICAL APPROACH FOR TRANSCATHETER AORTIC VALVE REPLACEMENT

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Background

Regarding an approach of transcatheter aortic valve replacement (TAVR), trans-femoral approach (TF) was first-line procedure in many trials/registries, and the results of TF was reported to be better than those of trans-apical approach (TA). But, there was several biases in those studies.

Objective

The aim of this study is to elucidate an efficacy and safety of trans-apical approach.

Patients and Method

Between 2009 and 2012, 48 consecutive patients undergoing TAVR with Edwards-SAPIEN were enrolled (Mean age, 83.2 ± 5.4 years; male, 39.6%). TA was performed in 20 patients and TF in 28 patients. There was no difference between TA and TF in preoperative patients' characteristics including pre-operative risk evaluations; EuroSCORE (21.9 ± 11.8 in TA and 22.6 ± 17.0 in TF [%]) and STS score (9.4 ± 3.8 in TA and 9.6 ± 5.9 in TF [%]).

Result

There was no difference in peri-operative complications including stroke (none in TA and one non-disabling stroke in TF), myocardial infarction (one in TA and none in TF), and any access related complications (one in TA and three in TF). One peri-operative death from annular rupture occurred in TA, which was not related to the TA. Postoperative hospital stay (18.6 ± 10.4 in TA and 23.4 ± 37.0 in TF [%]) and a rate of home discharge (90.0 in TA and 78.6 in TF [%]). Furthermore, all-cause mortality at 30-day was 5.0% in TA and 0% in TF, and at one-year with Kaplan-Meier analysis was 11.3% in TA and 14.7% in TF.

Conclusion

From our results, trans-apical approach for TAVR is as efficacious and safe as trans-femoral approach when there is no difference between TA and TF in pre-operative risk evaluations.

O8-2

ONE-YEAR OUTCOMES OF TRANSAPICAL TRANSCATHETER AORTIC VALVE REPLACEMENT IN PATIENTS WITH VERY SMALL BODY SIZE: PREVAIL JAPAN TRIAL

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Objective: Transapical transcatheter aortic valve implantation (TAVR) has been performed widely in Europe and North America. However, few data exist on effectiveness and safety of the procedure in patients with very small body size that are often seen in Asian countries. We assessed outcomes of transapical TAVR performed in the PREVAIL JAPAN Trial.

Methods: Between 04/09 and 04/10, 27 patients (mean age 85.9 +/- 5.3 years, mean body surface area 1.38 +/- 0.12 m2, mean STS score 10.6 +/- 5.3 %, mean logistic EuroSCORE 18.8 +/- 9.4 %) with symptomatic severe aortic stenosis underwent transapical TAVR with a 23- or 26-mm SAPIEN XT transcatheter valve and Ascendra 2 transapical delivery system in the trial. Clinical and echocardiographic outcomes were evaluated.

Results: The 30-day mortality was 11.1% (3/27). The incidences of symptomatic stroke, major bleeding, new pacemaker implantation and new mitral chordal rupture were 0%, 11.1% (3/27), 11.1% (3/27) and 11.1% (3/27), respectively. The mean effective orifice area changed from 0.55 +/- 0.11 to 1.54 +/- 0.32 postoperatively and then to 1.37 +/- 0.29 cm2 at 1 year. Postoperative paravalvular regurgitation was graded none/trivial in 76.9% and mild in 23.1%. All patients who were followed up at 6 months and 1 year demonstrated improvement of NYHA class. The 1-year actuarial freedom rates from all-cause death and cardiovascular death were 76.7% and 80.1%, respectively.

Conclusions: Transapical TAVR resulted in improvement of valve orifice area and NYHA class with feasible mortality and morbidities in high-risk patients with very small body size. The incidence of paravalvular leak was lower than previously reported.

O8-3

PERCEVAL S SUTURELESS VALVE IS REDUCING AORTIC CROSS CLAMP TIME IN MINIMALLY INVASIVE AORTIC VALVE SURGERY

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OBJECTIVE: To measure and compare aortic cross clamp (AXT) and cardiopulmonary bypass (CPB) time in four types of aortic valve replacements (AVR): isolated AVR in sternotomy (a), combined AVR in sternotomy (b), mini T sternotomy (c) and right anterior thoracotomy (d).

METHODS: AXT and CPB times were recorded in four different types of AVR during sutureless Perceval S implantations in 54 patients (mean age 76 years, 60% females).

RESULTS: AXT and CPB times are as follows (mean AXT/CPB in minutes): group a (24 patients) = 46 min./66 min. in combined cases, 42 min./61 min. in isolated, group b (21 patients) = 44min./67 min. right anterior thoracotomy (9 patients) = 62min./107 min. There were no paravalvular leaks of more or equals 2, mean AVA was 1.6 cm2, mean gradient for all the valves was 13.7 mmHg.

CONCLUSIONS: Perceval S implantation is reducing AXT and CPB time in minimally invasive aortic valve surgery with excellent postoperative results, especially in right anterior thoracotomy.

O8-4

AORTIC VALVE REPLACEMENT WITH KEMEROVO-AB-NEO STENTLESS BIOPROSTHESIS

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OBJECTIVE:

Our objective was to examine the clinical outcomes of aortic valve replacement with the Kemerovo-AB-Neo epoxy-treated bioprosthesis at 6 years.

METHODS:

The Kemerovo-AB-Neo was used for aortic valve replacement in 50 patients from 2005 to 2011. There were 39 men and 11 women with a mean age of 67±5 years. Aortic stenosis was present in 92% of patients, coronary artery disease in 30%, and left ventricular ejection fraction less than 0.40 in 16%. Patients had an annual assessment of valve function using echocardiography. The mean duration of follow-up was 36±16 (6-70) months.

RESULTS:

There were 1 operative and 0 late deaths. Survival at 6 years was 100%. One patient had echocardiographic evidence of bioprosthetic moderate structural dysfunction. The freedom from structural valve degeneration at 6 years was 96±2% for all patients. None of patients had redo aortic valve replacement. The freedom from redo aortic valve replacement at 6 years was 100%. Cusp tear with consequent aortic insufficiency was the most common cause of structural valve degeneration. At the latest follow-up contact, 92% patients were alive with the Kemerovo-AB-Neo valve in place, and 41% were in functional class I, 53% in class II, and 6% in class III. Maximum pressure gradient was 16±6 torr.

CONCLUSIONS:

The Kemerovo-AB-Neo epoxy-treated bioprosthesis has provided optimal patient survival and symptomatic improvement but suboptimal valve durability, particularly in patients less than 65 years of age. We now use of this valve mostly in older patients who have a small aortic annulus.

O8-5

SINGLE INSTITUTION EXPERIENCE WITH VALVE-SPARING ROOT REIMPLANTATION: RAPHED BICUSPID AORTIC VALVE VERSUS TRICUSPID AORTIC VALVE PATIENTS

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Objective. We report single institution midterm outcomes with root reimplantation procedure in bicuspid aortic valve patients (BAV) versus those with tricuspid aortic valve (TAV).

Methods. From 2001-2012, in a retrospective single institution review, patients with root reimplantation were divided into BAV (n=31) and TAV (n=91) groups.

Results. Demographics were similar. Preoperative echocardiography revealed similar dimensions (annulus: BAVmean 28.3, TAVmean 27.2mm, Sinus of Valsalva: 46.0, 48.0mm, p=NS). Aortic valve insufficiency (AI) was similar (AI<1+: BAV77%, TAV89%), but left ventricular diastolic dimension (LVDD) was greater in TAV (53, 59mm, p<0.05). 40 patients (44%) in TAV had Marfan's syndrome.

Perioperative parameters (<30 days) were similar. 71% (n=22) of patients in BAV and 80% (n=73) in TAV underwent concomitant hemiarch procedure with circulatory arrest. There was zero mortality with similar stroke rates in both groups (0%, 1.1%). There were no reoperations for bleeding in BAV and 4 (4%) in TAV (p=NS). Freedom from AI<1+ (94%, 95%, p=NS), peak gradient (PG) (11.6, 14.1 mmHg, p=NS), and mean gradient (MG) (5.6, 7.5 mmHg, p=NS) were similar.

Mean follow-up was 37 (BAV) and 73 (TAV) months. There was no mortality. Aortic reoperation was 0 in BAV and 1 (1.1%) in TAV in midterm (0.9% when combined). There was excellent freedom from AI<1+ (94%, 89%, p=NS, 90% when combined) with similar PG (12.2, 11.7 mmHg, p=NS) and MG (7.2, 5.3 mmHg p=NS). LVDDs at follow-up were lower compared to preoperative values, suggesting LV remodeling (BAV change: -7mm, p=0.001, TAV change: -11mm, p=0.0001).

Conclusion. Midterm outcomes with root reimplantation procedure remain excellent in this series: zero mortality, <1% aortic reoperation rate, and 90% of patients with AI<=1+. Although primary valve repair with root reimplantation is more complex in bicuspid patients, our results attest to the durability of the bicuspid aortic valve in the context of a reimplanted neoroot.

O8-6

STENTLESS COMPOSITE BIOLOGIC AORTIC VALVED CONDUIT FOR BENTALL OPERATION

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Objectives:

Aim of this study was to verify the feasibility and easiness of implant of a woven tubular prosthesis containing a 3Fstentless valve.

Methods:

Between April and July 2012, 12 patients underwent Bentall operation, using a composite 3F stentless valve inserted in a Jotec straight woven tube graft. Mean age was 67 yrs .Mean ischemic time was 108',mean CPB time 123'.In the last 8 cases, using a pre-assembled 27 mm, prosthesis in 28 mm graft ,the mean cross clamping time dropped to 88'.The valve, one size smaller than the tube, was secured inside the graft by three 4-0 polypropylene sutures at 120°.Identical stitches fixed the valve commissural tabs to the graft wall. Prosthesis attachment to the aortic root by U stitches, coronary arteries reimplantation and distal anastomosis by 5-0 polypropylene on teflon felt completed the procedure.

Results:

Early 30 days in-hospital mortality was 0%.At post-op TE Echo the mean pressure gradient was 5 mmHg, with perfect movements of the valve leaflets opening and closure, with images of linear and smooth flow.

Conclusions:

This technique has been previously reported .In the paper ,by dr Stewart et al ,a Valsalva Graft was employed. We believe that the 3F valve, because of its unique geometry and the importance of keeping the commissural tabs in a vertical alignment to avoid leaflet distortion in diastole, can work better in a woven straight tube graft.

O9-1

EARLY AND LATE OUTCOME OF AORTIC VALVE REPLACEMENT IN DIALYSIS PATIENTS

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Objective

The number of dialysis patients has been increasing in Japan. Dialysis patients are associated with a higher risk of cardiovascular diseases than non-dialysis patients. In particular, aortic stenosis is common and the selection of the type of prosthetic valve for aortic valve replacement (AVR) in dialysis patients is still controversial. The purpose of this study is to investigate the early and long term results AVR in our hospital.

Method

Between 2000 and 2011, 842 AVR were performed in our hospital in which there were 97 dialysis patients (11.5%) (male/female: 76/21). The mean age was 69.0±10.0 and the average period of dialysis was 9.0±8.3.

Results

Tissue valve was used in 84 patients (86.6%) and concomitant procedure was performed in 66 patients (68.1%). Five patients died within 30days after surgery and the reason of death was MOF, cerebral bleeding, pneumonia, CHF and VT. The overall survival at 5 years was 77.0% and freedom from heart related death was 95.7%. Survival rate in mechanical valve group was better than tissue valve group (81.0% v.s. 74.3% P=0.22). However, mean age was significantly younger in mechanical valve group than tissue valve group (56.3±12.5 v.s. 71.0±7.8, $p<0.01$). Multiple regression analysis showed age was a significant risk factor (p=0.02, OR=1.26, CI:1.03-1.53) for survival, but not the type of prosthesis. Focusing on tissue valve group, survival rate of patients who were less than 65-year old was significantly higher than that of patients who were more than 65-year old (92.9% and 63.6%), and there was no reoperation related to SVD.

Conclusion

AVR in dialysis patients showed a good early and long term results. Our data showed that age was the most important factor for long term survival after AVR in dialysis patients, but not the type of prosthesis.

O9-2

MID-TERM OUTCOMES AND HEMODYNAMIC PERFORMANCE OF BIOPROSTHESIS AFTER AORTIC VALVE REPLACEMENT IN PATIENTS WITH CHRONIC HEMODIALYSIS

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Objectives;

Renal failure is one of the known causes for rapid progression of aortic stenosis. Although rapid progression of bioprosthetic aortic valve stenosis is concerned, few data is available. The objectives of this study were to assess mid-term outcomes and hemodynamic performance of bioprosthesis after aortic valve replacement (AVR) in patients with chronic hemodialysis.

Methods;

Between 1999 and 2011, 129 patients with chronic hemodialysis undergoing AVR at 5 our affiliated institutions were retrospectively reviewed (mean age 68.7±8.5, male 63%). Concomitant procedures included the following: mitral annuloplasty 14 (11%); CABG 40 (31%). Bioprosthesis were implanted in 88 (68%) and mechanical valves in 41(32%). Outcomes measures included overall mortality and major valve-related events, and hemodynamic performance of prosthesis was determined by echocardiography.

Results;

Mean age of bioprosthesis was significantly higher than that of mechanical valve (71.0±6.7 vs 63.8±9.0, P<0.001). One- and three-year survival were 82% and 74% in bioprosthesis, 86% and 81% in mechanical valve (P=0.19), respectively. One- and three-year freedom from major valve-related event were 78% and 67% in bioprosthesis, 83% and 67% in mechanical valve(P=0.56), respectively. None of mechanical valve and 4 of bioprostheis required reoperation due to structural valve deterioration (SVD). Freedom from reoperation due to SVD was 87% at 5 years in bioprosthesis. Mean pressure gradient through bioprosthesis significantly developed during follow-up (Baseline;16.1±1.7, 3 year;18.3±3.9, 5 year;20.6±5.5, mmHg, P=0.003) .

Conclusions;

Our mid-term results after AVR in patients with chronic hemodialysis were favorable, and there was no significant difference within prosthesis. Progression of SVD is still concerned in longer follow-up period, and careful follow-up is needed for patients with bioprosthesis.

O9-3

WITHDRAWN

O9-4

LONG-TERM RESULTS OF AORTIC VALVE REPLACEMENT WITH MECHANICAL VERSUS TISSUE VALVES IN SEXAGENARIANS

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It is very troublesome in deciding which type of prosthetic valve to use when performing aortic valve replacement (AVR) in the elderly. This study focused on comparing long term cardiac related morbidity and mortality in AVR with mechanical and tissue valves in sexagenarians.

From January 1995 to December 2011, 270 patients in their sixties who underwent primary AVR for aortic valve disease were reviewed retrospectively. Mean follow-up period was 58.7±44.0 months (range, 3 to 198). One hundred seventy-seven patients underwent AVR with a tissue valve, and 93 with a mechanical valve. Our general criteria for valve selection was tissue valve for patients over 65 years. Two hundred fifty-four patients (94%) had degenerative aortic valve disease, and 16 (6%) with rheumatic. Preoperative patient characteristics, postoperative events and mortality were analyzed.

Among many preoperative risk factors, mean age (66±2.6 versus 62.6±2.3, $p<0.001$), history of stroke (7% versus 1%, $p=0.039$) and EUROscore (4.9±1.6% versus 4.2±1.3%, $p<0.001$) were higher in patients with tissue valve replacement than mechanical valve. There was no early postoperative mortality in both groups. Kaplan-Meier analysis showed no significant difference in long term cardiac related mortality between both groups (log rank $p=0.700$, and $p=0.198$ after propensity score matching). A higher incidence of anticoagulation related complications were showed after mechanical valve replacement than tissue valve replacement (log rank $p=0.017$, and $p=0.006$ after propensity score matching). In addition, there was no difference in incidence of anticoagulation related complications after mechanical valve replacement whether the patients had a lower educational status or distant residence from our hospital ($p=0.861$ and $p=0.428$, respectively).

AVR with tissue valve had with similar results in overall cardiac related mortality compared to mechanical valve replacement in sexagenarians, as well as significantly lower anticoagulation related complications. Further long term follow-up is needed to evaluate the late incidence of structural valve degeneration.

O9-5

THE OPTIMAL TIMING OF AORTIC VALVE REPLACEMENT IN ELDERLY PATIENTS WITH SEVERE AORTIC STENOSIS

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Purpose: The elderly population with severe aortic stenosis (AS) requiring aortic valve replacement (AVR) is increasing. The optimal timing ofAVR in these patients has been under discussion.

Methods: We retrospectively reviewed data from severe AS patients (n = 84) who underwent AVR with/without concomitant procedures from 2005 to 2010. Symptom status, preoperative data, operative outcome, late survival and freedom from cardiac events were compared between elderly patients (age, >80 years [n = 31]) and younger patients (age, <80 years [n = 53]).

Results: The operative mortality in elderly patients (3.2%) and younger patients (3.8%) was comparable. Symptoms in elderly patients were more severe and hospitalized heart failure (HF) was more frequently noted as the primary symptom (p=0.017). Patients with and without hospitalized HF differed significantly in late survival and freedom from cardiac events (p = 0.001), but advanced age had no significant effect. Cox proportional hazards analysis revealed that hospitalized HF was a significant predictor for cardiac events after AVR irrespective of age (hazard ratio, 6.93; 95% confidence interval, 1.83 to 26.26; p < 0.004).

Conclusions: In elderly patients with severe AS, surgery should be recommended even if the symptoms are minimal and should be performed before the onset of HF that requires hospitalization.

♥ O9-6

IMPACT OF CONCOMITANT ATRIAL FIBRILLATION ABLATION IN PATIENTS UNDERGOING AORTIC VALVE REPLACEMENT

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OBJECTIVE : The prognostic significance of preoperative atrial fibrillation (AF) and the impact of a concomitant surgical ablation at the time of aortic valve replacement (AVR) is unclear.

METHODS : A retrospective analysis was performed on a total of 124 patients with AF who underwent AVR with (n=50, Maze group) or without (n=74, no-Maze group) a concomitant surgical ablation between 2000 and 2011. We compared early/late clinical and echocardiographic outcomes.

RESULTS : There were 4 (3.2%) early death (1 [2.0%] in the Maze group, and 3 [4.1%] in the no-Maze group, p=0.65). The rate of sinus rhythm restoration was 85% versus 12.2% (P <0.001). During a median follow-up of 18.1 months (interquartile range [IQR]: 6.9-47.8 months), there were 19 (15.3%) late deaths, 33 (26.6%) valve-related complications. There was no statistical difference in the occurrence of major adverse cardiovascular events between the two groups (p=0.26). Major event-free survival at 5 years was 60.9 ±9.9% in the Maze group and 57.0 ±10.3% in the no-Maze group (p=0.41). On weighted Cox regression analysis, concomitant AF ablation had no increased relative risk of major adverse cardiovascular events (HR 0.92, 95% CI 0.43-1.96, p=0.82). After a median echocardiographic follow-up of 22.9 months (IQR: 10.6-48.0 months), LA dimension was smaller (46.9mm vs 50.4mm, p=0.017), and EF was better (60.6% versus 58.0%, p=0.059) in the Maze group at the last follow up. The rate of postoperative warfarin use was also lower in the Maze group (53.1% versus 89.2%, P <0.001).

CONCLUSIONS : Although concomitant surgical ablation at the time of AVR was not associated with decrease in survival and major adverse cardiovascular events, it had favorable results in terms of increased restoration of sinus rhythm, better echocardiographic results, and decreased rate of warfarin use without additional surgical morbidity and mortality.

♥ : Travel Grant

O10-1

MEDIUM-TERM RESULTS OF A NEW GENERATION STENTLESS AORTIC PROSTHESIS: HEMODYNAMIC PERFORMANCE OF MEDTRONIC 3F AT REST AND UNDER EXERCISE AT 5 YEARS IN 100 PATIENTS

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OBJECTIVE: Aim of this study was to evaluate the clinical and hemodynamic results at 5 years of Medtronic 3F stentless equine pericardial aortic valve.

METHODS:
Between March 2007 and May 2012 a total of 100 consecutive patients affected by aortic valve disease received a 3F valve at our unit. The size ranged between 21 and 29, with prevalence of 23 and 25 implants .Mean age at operation was 75,6±8,0 years, 54% were males, the mean logistic EuroScore was 8,7±5,2 and 47% received concomitant procedures. For isolated replacements the mean ECC time was 90'±10', Cross Clamp time 72'±8'.In 10 pts the aortic prosthesis was included in a Dacron tube straight graft for a Bentall operation.

RESULTS:
Early mortality in isolated AVR was 2,1% and 3,1% in the entire group. There have been 6 late all-causes deaths(5,6%) ,with a survival of 90% at 5 yrs. 91% of patients are in NYHA class I or II. Actuarial freedom from reoperation for structural deterioration is 100% at 5 years.. Freedom from endocarditis and thromboembolic events were 96% and 99% respectively. The 72 patients evaluated under exercise at 75w protocol showed a moderate increase in the MPG (from 7,8±3,3mmHg to 11,6±4.0mmHg) for the entire series at five years follow up.

CONCLUSIONS:
The 3F valve shows excellent hemodynamics, durability and freedom from structural deterioration at 5 yrs follow-up. Freedom from endocarditis and thromboembolic events look also satisfactory. Longer follow-up times are needed for a better evaluation of this interesting new generation, user friendly aortic valve substitute.

O10-2

OUTCOME OF AORITC VALVE REPLACEMENT WITH 17-MM SJM REGENT PROSTHETIC VALVE FOR PATIENT WITH A SMALL AORTIC ANNULUS IN ADULT POPULATION

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(OBJECTIVE)

The optimal management of the small aortic annulus during aortic valve replacement (AVR) is still controversial. The aim of this study was to investigate the clinical outcome of AVR performed with 17-mm St. Jude Medical (SJM) Regent prosthetic valves for small aortic annulus in adult population.

(METHODS)

Between January 2000 and November 2012, 384 patients underwent AVR and 15 patients (age 72.3±8.50, body surface area 1.34 ± 0.12 m^2) using 17-mm SJM Regent prosthetic valves. 6 were isolated AVR, 3 were AVR with CABG, 3 were with MVR, 2 were with TAP, 1 was with myotomy of the left ventricular outflow tract.

(RESULTS)

The mean follow-up period was 1195 ± 677 days. The mean aortic cross-clamp time was 110.6±41.7 min, and total perfusion time was 157.6±36.3 min. In trans-thoracic echocardiography, the mean transaortic pressure gradient, which was 73.6±76.8 mmHg preoperatively, decreased to 12.0±4.47 mmHg postoperatively. The mean post operative EOAI was 0.97±0.08cm^2/m^2. Patient prosthesis mismatch (effective orifice area index (EOAI) ≦ 0.85 cm^2/m^2) was observed in 2 patients. The left ventricular mass index, which was 144.5±50.6 g/m^2 preoperatively, also significantly decreased to 116.0±43.4 g/m^2 postoperatively. Subjective symptoms diminished in all patients, and neither mortality nor cardiac event occurred during whole follow up.

(CONCLUSIONS)

AVR with the 17-mm SJM Regent prosthetic valve for patient with a small aortic annulus in adult population is an excellent option with good hemodynamic performance and decrease of cardiac mass volume. This prosthesis can avoid annular-enlargement procedure.

O10-3

ST. JUDE MEDICAL TRIFECTA TM AORTIC BIOPROSTHESIS: AN ASSESSMENT OF MIDTERM HAEMODYNAMIC PERFORMANCE IN SMALL AORTIC ROOTS

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OBJECTIVE: The St. Jude Medical Trifecta TM aortic supra-annular bioprosthesis is regarded as the next generation in pericardial stented tissue valves. The unique design of tissue leaflets attached to the exterior of the valve stent provides unrivalled in-vivo mean gradients and haemodynamics. The aim of this prospective study was to evaluate midterm haemodynamic performance of valves implanted into small aortic roots.

METHODS: Thirty-two consecutive patients undergoing aortic valve replacement using the St. Jude Medical Trifecta TM valve at a single UK centre over a 24-month period were included in this study. Patients undergoing concomitant cardiac procedures were included. All implanted valves were 19mm or 21mm in size. Assessment of haemodynamic function was carried out using transthoracic echocardiography pre-operatively and at follow-up, as well as transoesophageal echocardiography intra-operatively.

RESULTS: The study population consisted of 32 patients (5 male, 27 female). Mean age was 72.3 ±6.8 years. Implanted valve sizes were 19mm (n=6) and 21mm (n=26). Overall mean post-operative pressure gradients were 9.68 ±4.87mmHg (mean) and 18.53 ±8.05mmHg (peak). Subgroup mean post-operative pressure gradients were 10.15 ±4.45mmHg (mean) and 19.04 ±8.54mmHg (peak) for the 19mm cohort and 9.6 ±5.1mmHg (mean) and 18.72 ±8.6mmHg (peak) for the 21mm cohort. Overall mean post-operative left ventricular ejection fraction was 61 ±0.13%. Overall mean effective orifice area was 1.05 ±0.25cm2. All valves were well-seated and only 4 exhibited trivial regurgitation.

CONCLUSIONS: These results of our experience demonstrate excellent haemodynamic performance of the Trifecta TM bioprosthetic valve in the small aortic root.

O10-4

AORTIC CROSS-CLAMP TIME AS OPERATIVE MORTALITY DETERMINANT IN ISOLATED OR COMBINED TO CORONARY REVASCULARIZATION AORTIC VALVE REPLACEMENT

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Objective: sutureless aortic valve bioprostheses allow a reduction of the aortic cross-clamp time (AXCT) in surgical aortic valve replacement. This study aims to define the impact of the AXCT on operative mortality in aortic valve replacement isolated or associated to coronary artery revascularization (CABG).

Methods: a consecutive series of 3,518 adult patients who underwent surgical replacement of the aortic valve with or without associated CABG was extracted from our database. The impact of the AXCT on operative mortality was explored in an univariate model and subsequently tested within a multivariable model adjusted for possible confounders. A predictive logistic model for operative mortality was created and tested. A simulation model was created based on the same predictors, and tested for the predictable decrease in AXCT obtainable with sutureless bioprostheses.

Results: 2,383 patients (67.7%) had isolated aortic valve replacement, and 1,135 (32.3%) an associated CABG procedure. The operative mortality was 2.9% (1.8% in isolated procedures and 5.1% in associated CABG procedures). The AXCT was 65±25 minutes (61±24 minutes in isolated procedures and 75.3±24 minutes in associated CABG procedures). At the univariate analysis, the AXCT was significantly associated with the operative mortality (odds ratio 1.016, 95% confidence interval 1.01-1.022, P=0.001). In the multivariable model the AXCT remained an independent predictor of operative mortality (odds ratio 1.013, 95% confidence interval 1.005-1.02, P=0.001). According to this model, the predicted mortality rate was 2.71% in the overall population, 2.0% in isolated aortic valve replacement, and 4.2% for associated CABG procedures. These values were significantly (P< 0.05) reduced in the simulation model to respectively 1.28%, 1.0%, and 1.86%.

Conclusions: the relative risk of operative mortality increases by 1.3% per each 1 minute increase of the AXCT. A reduction of the AXCT in the predictable range for sutureless bioprostheses leads to a significant decrease of the operative mortality.

O10-5

EXCELLENT PERFORMANCE AT REST AND UNDER EXERCISE OF A STENTLESS BIOPROSTHESIS. A NEW PERSPECTIVE FOR THE INCREASING IMPORTANCE OF VALVE HEMODYNAMIC ASSESSMENT UNDER EXERCISE

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OBJECTIVE:

Heart valves prostheses performance has often been evaluated at rest, but the real responsiveness of a prosthesis can be appreciated under exercise conditions. Aim of this study was to compare the hemodynamic performance of Sorin Pericarbon Freedom (PF) at rest and under stress conditions, to evaluate the capability of the prosthesis to adapt to different conditions.

METHODS:

Between March 2003 and April 2010 a PF stentless valve was implanted with a double-line sub-coronary technique in 250 consecutive, non selected patients (mean age:68,7 yrs with 16% older than 80 years), Mean EuroScore was 8,36, 43,2% of patients underwent concomitant procedures. In a subgroup of 184 pts the hemodynamic performance was evaluated according to a protocol of moderate exercise conditions.

RESULTS:

A moderate increases of gradients was observed even under maximum exercise: Mean Pressure Gradients increased from 7,8±3,3mmHg to 11,6±4.0mmHg, Peak Pressure Gradients increased from 14,9±5,2mmHg to 21,6±6,5mmHg,. The Effective Orifice Area increased from 1,86±0,69 cm2 to 1,96±0,71 cm2,(p value <0,0001), indicating possible valve adaptation to changed hemodynamic conditions and showing how the absence of a rigid stent is advantageous to the valve performance.

CONCLUSIONS:

The unique design of PF and its construction with pliable and thin bovine pericardium, avoids flow obstruction and does not add any stiffness to the annulus. This is could explain the response under stress conditions, giving a more reliable perspective on the valve performance. The low gradients and the increase in Effective Orifice Area endorses the use of the PF prosthesis also in active, younger patients.

O10-6

NOVEL APPROACH TO AORTIC INSUFFICIENCY BASED ON QUANTITATIVE CARDIAC WORKLOAD ESTIMATION FROM VISUALIZED BLOOD FLOW WITH MRI AND ECHOCARDIOGRAPHY

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Objective: Surgical indication for aortic regurgitation (AR) has been dependent large part on subjective complaints, or has been deteriorated left ventricular functions with dilated chamber or with decreased contractility, and optimal timing of the surgical treatment in order to preserve ventricular prognosis is unclear. We aimed at estimating cardiac workload affected by the inefficient flow caused by AR quantitatively, using recent blood flow visualization techniques with echocardiography and MRI (magnetic resonance imaging).

Methods: Color Doppler echocardiography with speckle tracking was taken in normal subject and a mild to moderate AR patient, and intraventricular blood flow was visualized with vector flow mapping (VFM). Cardiac MRI with phase velocity mapping was taken in three mild to moderate AR patients. Ventricular chamber extracted from the cine mode images was superposed to phase contrast images to reconstruct blood flow. From these visualized flow, flow energy loss with viscous dissipation was calculated to evaluate ventricular excessive workload.

Results: In normal subject, VFM detected well-organized vortex flow during the diastolic phase, whereas in an AR patient, jet flow directed toward the posterior wall and bounce, resulting in secondary turbulence in the apical region. Flow energy loss during the late diastolic phase was 3.65 times higher in AR patient than in normal subject. In MRI flow visualization, AR jet directed parallel to the anterior mitral leaflet in two cases formed large vortex around inlet region and dissipated energy (0.94 N/sec), whereas AR jet directed to the septum in one case caused flow collisions with transmitral inflow, resulting in energy loss (1.39 N/s).

Conclusions: In AR, not only regurgitation itself such as regurgitant fraction or Sellers classification, but also flow collision with transmitral inflow or turbulence around the jet should be taken into consideration. Quantitative evaluation of hemodynamics would be helpful to determine the therapeutic strategy.

O11-1

IMPACT OF ENDOVASCULAR SURGERY ON INCIDENCE OF ATRIAL FIBRILLATION FOLLOWING AORTIC ARCH REPAIR

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OBJECTIVE Atrial fibrillation (AF) is associated with increased morbidity after open heart surgery, though little is known about its incidence after aortic surgery. We recently introduced thoracic endovascular aortic repair (TEVAR) with cervical debranching for aortic arch repair. Herein, we analyzed the risks of postoperative AF in patients who underwent aortic arch repair and the efficacy of TEVAR for prevention.

METHODS We studied 141 consecutive patients (104 males, mean age 68.2±12.2 years) with atherosclerotic aneurysm (n=91) or aortic dissection (n=50) who underwent aortic arch repair since 2007, of whom 75 underwent TEVAR with/without a cervical debranching technique, and 66 total arch replacement. Various perioperative parameters were evaluated to identify possible risk factors for postoperative AF using prospectively collected national surgical database.

RESULTS Postoperative AF developed in 33 patients (23.4%) and was associated with increased respiratory complications (27.2% vs 9.3%, $p<0.01$). Postoperative AF incidence in patients with TEVAR was significantly lower than in those with total arch replacement [4% (3/75) vs 45.4% (30/66), $p<0.001$]. Univariate analysis revealed age, hypertension, angina, non-TEVAR, and transfusion as significant risk factors for postoperative AF. In multivariate analysis, age (odds ratio 1.077, $p<0.01$) and non-TEVAR (odds ratio 16.45, $p<0.01$) were independent risk factors correlated with postoperative new AF onset.

CONCLUSIONS Atrial fibrillation was frequently seen in aortic arch repair cases, especially those with total arch replacement using cardiopulmonary bypass. Advanced age and non-TEVAR were predictors of new postoperative AF onset. Endovascular surgery was useful to reduce the incidence of postoperative AF after aortic arch repair.

O11-2

DUTCH EXPERIENCE WITH THE ANACONDA FENESTRATED ENDOGRAFT FOR JUXTA- AND PARARENAL AAA REPAIR

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Background. Recently, a new fenestrated endograft based on the approved Anaconda AAA stent graft system has been introduced to treat juxta- and suprarenal abdominal aortic aneurysms. The device has some potential advantages. There is virtually zero columnar strength, which makes it a very flexible device, and it is repositionable even after complete unsheating. The aim of this pilot study is to present the first Dutch experience with the new fenestrated Anaconda endograft.

Methods. Between May 2011 and October 2012, in total 12 implants were performed in the Netherlands in six different hospitals. All except one were men with a median age of 73 years. Median aneurysm size was 65mm, and all aneurysms were all juxtarenal, except one. Eight endografts had two fenestrations for the renals, three had three fenestrations. The results were retrospectively analyzed from a prospectively held database.

Results. Technical success was achieved in 11 out of 12 patients. In one, the procedure got complicated by trash to pancreas, kidneys and bowel arteries and there was an inadequate placement of the SMA stent, and this patient died after 17 days. There were 2 type 1 endoleaks, but both had disappeared at the 1st CT after one month. Mean follow-up was almost 4.5 months. During that time, 1 patient died after 4 months because of stroke. No ruptures occurred. With regard to renal function, there were no serious drops, and median clearance before the operation and at last follow-up remained exactly the same at 60 ml/min. All vessels remained patent.

Conclusion. The fenestrated Anaconda has acceptable immediate and short-term results, and can be used when conventional infrarenal EVAR is impossible. Long-term results are needed for definitive proof.

O11-3

RELATIONSHIPS BETWEEN ANEURYSM CHARACTERISTICS AND FIBRINOLYTIC RESPONSE EARLY AFTER ENDOVASCULAR ANEURYSM REPAIR

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OBJECTIVE: Changes in blood coagulation and fibrinolytic systems (BCFS) after endovascular aneurysm repair (EVAR) are generally tolerable. However, some patients experience consumptive coagulopathy including disseminated intravascular coagulation. Risk factors toward massive coagulopathy are unclear. We investigated relationships between aneurysm characteristics on CT and changes in BCFS early after EVAR. METHODS: Thirty-two patients who underwent thoracic EVAR were selected for this study. Aneurysm characteristics including pre-existing intra-aneurysmal thrombus before surgery (PE-IAT) and newly-generated IAT after surgery (NG-IAT) were measured with 3D-CT volumetry. Endoleak (EL) was also assessed. Platelet count (Plt), fibrinogen (Fbg) and D-dimer (DD) were evaluated before and early after surgery (postoperative day 0 to 7). In postoperative biomarkers, minimum Plt and Fbg and maximum DD were used for statistical analysis as representative values. RESULTS: Mean Plt, Fbg and DD before surgery were $19.6 \pm 4.5 \times 10^4$ mm^3, 330 ± 104 mg/ml and 3.7 ± 3.3 μg/ml, respectively. Mean Plt, Fbg and DD early after surgery were $12.7 \pm 4.3 \times 10^4$ mm^3, 281 ± 93 mg/ml and 17.1 ± 12.9 μg/ml, respectively. PE-IAT and NG-IAT were 57.0 ± 47.9 cm^3 and 29.8 ± 25.4 cm^3, respectively. Maximum aneursym diameter (mean 53.9 ± 9.9 cm) was not associated with any biomarkers of BCFS. EL seemed to be associated with DD after surgery, however, this correlation was not statistically significant ($p = 0.056$). Increase in DD after EVAR without EL was significantly correlated to PE-IAT and NG-IAT ($p = 0.003$, $p = 0.004$, respectively). CONCLUSIONS: Interaction between aneurysm characteristics and BCFS was detailed. NG-IAT in absence of EL as well as PE-IAT was strongly related to DD early after EVAR. Based on these findings, DD after EVAR may be predictable preoperatively through aneurysm characteristics. Prediction of changes in BCFS may help to prevent or manage massive coagulopathy after EVAR.

O11-4

EARLY AND LATE RESULTS WITH THORACIC ENDOVASCULAR AORTIC REPAIR (TEVAR) FOR NON-ACUTE STANFORD TYPE B AORTIC DISSECTION

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OBJECTIVE

Recent progress in aortic endovascular stent-grafting has brought some enthusiasm to interventionists to expand its indication to aortic dissection even though the late outcome remains unclear. The purpose of this study is to evaluate early and late results of thoracic endovascular aortic repair (TEVAR) for non-acute Stanford type B aortic dissection at our institute.

METHODS

Inpatient and outpatient records were retrospectively reviewed. Cases operated on within 14 days after the onset of acute aortic dissection and cases with rupture or malperfusion were excluded from this study.

RESULTS

45 patients underwent 53 operations of TEVAR for non-acute type B dissection from 1998 to 2012. Mean age was 55±13 (23-79) years. Indication for operation was patent false lumen in 34 and ulcer-like projection (ULP) in 19. Interval from the onset of acute dissection was 523±1007 (15-5678) days. All had femoral artery approach except 1 abdominal aortic approach and 2 external iliac. There was no early mortality. Of 34 cases that had patent false lumen before TEVAR, 4 (12%) had complete obliteration of the false lumen in the entire aorta shown by computed tomography before discharge. Of 19 that had ULP preoperatively, 17 (89%) had complete elimination of ULP. At late follow-up (2651±1362 days) of the 45 patients, survival after the initial TEVAR was 100%, 86% and 62%; freedom from aortic operation was 87%, 73% and 59%; freedom from open aortic surgery was 89%, 84% and 72%, at 1, 5 and 10 years. Of 15 late deaths, 2 were aortic rupture and other 2 were operative deaths related to aortic surgery.

CONCLUSION

The early results of TEVAR for non-acute Stanford type B aortic dissection were acceptable. However, the late outcome is yet to improve. At present, TEVAR for uncomplicated non-acute type B aortic dissection is not generally recommended.

O11-5

IMPACT OF ENDOVASCULAR AORTIC REPAIR WITH CONFORMABLE TAG FOR TYPE B DISSECTIONS

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The treatment of type B aortic dissections has been shifting to thoracic endovacualar aortic repair (TEVAR). However, there has been no suitable TEVAR device for aortic dissections until now. Recently, the new device, conformable TAG thoracic endoprosthesis (cTAG) has extremely flexibility and wide treatment range. So we elucidated the efficacy and safety of TEVAR with cTAG for type B aortic dissections.

[Methods] In our institution, 324 patients were performed TEVAR from 2010 to 2012, and there were 14 TEVAR with cTAG for type B dissections among them. 9 cases were male, and mean age was 56.6 years old. There were subacute dissection in 3 cases , and chronic in 10 cases. The mean period to TEVAR from the onset was 22. 6months.

[Results] We performed simple TEVAR in 9 cases, and cervical debranching TEVAR in 5 cases. Procedural success rate was 100%, 30 day mortality was 0%. There was no major post-operative complication, and one type I endoleak. In terms of late results, the mean follow-up period was 15.5 months (2- 25 mo.) and follow-up completion was 21%. There were no aortic related death and two re-intervention. Freedom rate from aortic events was 81.8% in one years. 12 cases (86%) had thrombosis of false lumen at the discharge by way of CT scan, and we achieved shrinkage of false lumen at 6 months after TEVAR in all cases.

[Conclusion] We achieved satisfactory early and mid-term results of TEVAR with cTAG for type B aortic dissections. Although further follow-up is mandatory, TEVAR with cTAG may become one of standard procedures for type B aortic dissections.

♥ O11-6

EARLY EXPERIENCE OF ENDOVASCULAR STENT-GRAFT REPAIR FOR AORTIC EMERGENCIES

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Objective

Aortic emergencies are some of the most catastrophic clinical condition that carry high mortality. Endovascular stent-graft repair that revolutionalised the elective aneurysm treatment is gradually being adopted in emergency situations. Favourable results had been reported by some major centres. This study aims to review the clinical outcomes of emergency endovascular aortic treatment in a tertiary referral center.

Method

We reviewed all patients with emergency endovascular aortic repair performed from March 2009 to Nov 2011 .Computer tomography was performed and patients were assessed for endovascular suitability. All patients with symptomatic/ruptured aortic pathologies were included in this study. The primary end points were post-operative mortality and secondary intervention.

Result

Twenty eight patients with a mean age of 70 years-old underwent emergency endovascular aortic repair. Nine patients were treated for ruptured abdominal aortic aneurysm; eight patients for ruptured thoracic/thoraco-abdominal aortic aneurysm; five patients for aortic dissection; four patients for traumatic aorta transection and two patients were treated for infected pseudoaneurysm with pending rupture.

Stent graft was successfully deployed in all cases. No open conversion was required. Nineteen patients underwent complete endovascular treatment; six patients required chimney procedure and three patients underwent extra-anatomic bypass for the supra-aortic vessel to provide an adequate landing zone.

The 30-day mortality rate was 10%: Three patients died within 24 hours; two due to severe hypovolaemic shock and one due to bowel ischaemia. Two patients developed acute limb ischaemia post procedure and required secondary intervention. The median follow-up of surviving patients was 18 months. One patient developed endoleak one year later and required an iliac extension.

Conclusion

Our series shows endovascular repair is a feasible and effective treatment for aortic emergency with a reasonable clinical outcome.

♥ : Travel Grant

O11-7

BRIDGE-USE OF AORTIC STENT-GRAFT FOR BLUNT TRAUMATIC AORTIC INJURY IN THE YOUNGER PATIENTS

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Objectives: Traumatic aortic injury (TAI) is associated with fatal outcome for the patients with blunt trauma. Thoracic endovascular aortic repair (TEVAR) has been rapidly adopted as an alternative to the traditional open aortic repair (OAR) for treatment of TAI. However, long-term efficiency of TEVAR for the younger patients remains unclear. We analyzed our experience of TEVAR as a bridge to the OAR in the younger patients with TAI.

Methods: Between 9/03 and 5/12, 41 patients with TAI were arrived to our institute, including 10(24%) required emergent room thoracotomy and open repair due to homodynamic instability (ERT group). In remaining 31 patients, 22 (54%) underwent TEVAR and 8 (20%) underwent OAR as an initial treatment.

Results: Mortality of ERT, OAR, TEVAR group was 100%, 25%, 9%, respectively, and there were significant differences between groups ($p<0.001$). However, in TEVAR group, 8 patients.(mean age 33 years) required secondary treatment, such as removal of the stent-graft and OAR, due to migration of the stent-graft and appearance of Type I endoleak.. High incidence of graft migration was related to acute angulation of the aortic arch in the younger patient. Time interval from TEVAR to OAR was 39.5 days. There was one complication (cerebellar infarction) related to secondary treatment, but none of the patient died postoperatively. In the result, especially in younger patients (under 40 years old), 12 of 13 (92%) patients underwent OAR, including 5 as an initial treatment and 7 as a secondary treatment.

Conclusions: TEVAR is a safe and effective procedure for treatment of blunt traumatic aortic injury with multiple organ injuries. However, in the younger patients, due to high incidence of a stent-graft migration, TEVAR, as a bridge-use to the open aortic repair, is strongly recommended.

O11-8

THE VERTEBRAL ARTERY BYPASS FOR ENDOGRAFTING

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Objective: It still remains to be elucidated whether the reconstruction of vertebral artery (VA) is necessary when it is closed by endografting. We report six patients who underwent reconstruction of vertebral arteries for endografting.

Method: Among six patients (78±5 years, 3 male), indications for endografting were aortic aneurysms in 4 patients, and right subclavian artery aneurysm in 2. VA was exposed through the cervical incision behind CCA. All 4 patients with aortic aneurysms had aberrant vertebral arteries which arose directly from aorta between left carotid (LCCA) and subclavian (LSCA) arteries. The right axillar (RAxA) to LCCA and LAxA bypass with 8mm EPTFE graft was applied for one patient with Zone 0 landing and two patients with Zone 1 landing. For one patient with Zone 2 landing, LCCA to LSCA bypass with 8mm EPTFE graft was utilized. LVA was reconstructed by the saphenous vein graft (SVG) which was anastomosed to EPTFE graft to LAxA or LSCA. In two patients who had right subclavian artery aneurysm, one underwent RCCA to RVA bypass with SVG before the endografting from RSCA to RAxA, and the other underwent LCCA to RCCA bypass (EPTFE graft) and reconstruction of RVA with SVG before the endografting for brachio-cephalic artery to RAxA.

Result: There was no operative mortality. Primary technical success showing complete exclusion of the aneurysm was achieved in all patients. None showed perioperative stroke. One patient who needed long coverage of aorta (zone 1 to 11) developed paraplegia. Postoperative CT at one week revealed all grafts including SVG to VA were patent.

Conclusions: Short-term outcome after endografting utilizing reconstruction of vertebral arteries was encouraging.

O11-9

LIMITED INDICATION OF THORACIC ENDOVASCULAR AORTIC REPAIR FOR AORTOESOPHAGEAL FISTULA

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Objective: Management of aortoesophageal fistula (AEF) remains controversial. TEVAR is useful as an initial control of bleeding, however, AEF is a major complication of TEVAR. This study evaluates the early and late outcomes of surgical treatment of AEF.

Methods: Between 6/04 and 3/12, 502 cases of thoracic aortic disease were repaired, including 6 presenting with AEF. The mean age of the patient was 75.5 years. Four were rupture of the thoracic aortic aneurysm into the esophagus (primary AEF) and 2 were presented with esophageal perforation after TEVAR (secondary AEF: duration between TEVAR and formation of AEF was 30 days and 6 years, respectively).

Results: Emergent aortic repair and esophageal resection was performed in all cases. In primary AEF, TEVAR was selected in all cases. In two cases, TEVAR was applied as a temporary use for protection of the massive bleeding and removal of the stent-graft and a Dacron graft replacement were performed after initiation of cardiopulmonary bypass (CPB). In secondary AEF, removal of the stent-graft and in-situ graft replacement was selected under CPB. Esophageal reconstruction was performed by using gastric tube or intestinal interposition. All patients survived initially, however, only 4 patients survived 1 year after repair, including one required removal of the stent-graft for infection and a Dacron graft replacement after 10 months.

Conclusion: TEVAR is useful for bleeding control in AEF, while it has the risk of developing potentially AFE and infection. In our patient population, TEVAR is recommended only for bleeding control in the treatment of AEF.

O12-1

A STUDY OF THE AORTIC ROOT GEOMETRIC ANATOMY AND IN NORMAL CONDITIONS AND IN ANNULOAORTIC ECTASIA FROM A SURGICAL PERSPECTIVE

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Backgrounds: The geometry of the aortic root is recognized as being asymmetric. However, studies on the changes occurring in annuloaortic ectasia are limited. The geometric patterns of the aortic root in annuloaortic ectasia in relation to the normal aortic root were investigated.

Methods: The aortic root parameters were measured from oblique sagittal images of multiplanar reformatted computerized tomography (CT) studies parallel to the aortic root in 33 control subjects (group I) and in 39 annulo-aortic ectasia patients (group II) that received surgery between November 2003 to January 2010. The study parameters which comprised inter-commissural distances (ICD), the sinus depths, and sinus volumes of the individual sinuses in the aortic root were compared within and between groups.

Results: In group I, the left coronary sinus (LCS) ICD and sinus depth measurements were the smallest of the three sinuses while the sinus volume, although not significant was also the smallest. In group II, all parametric measurements of the RCS and NCS structures were similar to each other while being significantly larger than the LCS ($P<0.0001$).

Conclusions: The RCS and NCS dimensions were similar to each other while being larger than those of the LCS in both annuloaortic ectasia and normal conditions. Further research is warranted to better understand the pathological and clinical implications of these findings on valve sparing root reparative procedures and in the development of valvular prostheses.

O12-2

INDICATION OF VALVE-SPARING AORTIC ROOT REPLACEMENT FOR ANNULO-AORTIC ECTASIA - PREOPERATIVE RISK FACTOR ANALYSIS WITH MULTIVARIATE COX REGRESSION PROPORTIONAL HAZARD MODEL

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OBJECTIVES) Current widespread use of valve-sparing aortic root replacement (VSARR) still remains controversial, especially in Marfan cases, concerning about worse prognosis during decades follow-up. The purpose of this study is to clarify risk factors for reoperation, recurrent AR, and late mortality and to reevaluate the indication of VSARR.

METHODS) We retrospectively analyzed 82 patients who had undergone VSARR in our department since 1998. The indication is basically non-urgent annulo-aortic ectasia without morphologically-abnormal valves. Mean follow-up was 4.2 years (0.0-11.8), which was completed in all. Prognosis was evaluated by Kaplan-Meier method, and the risk factors of adverse events (death, AVR, or AR greater than mild) were examined by Cox regression hazard models.

RESULTS) Mean age was 33.5±14.6, and 53 patients (64.6%) were male. Marfan syndrome was seen in 63 patients (76.8%). Procedures were David V in 59 patients, David I in 19, and Yacoub in 4. There was no in-hospital mortality. During follow-up, AVR was performed in 5. Mortality was seen in 7, including 3 sudden deaths. Overall survival and AVR-free rate in 10 years were 86.5% and 93.7% respectively. Risk factors for adverse events were preoperative AR greater than mild (p=0.019, Hazard ratio 7.45, C.I. 1.40-39.7) and greater Z score (Zs) of aortic annulus (p=0.011, Hazard ratio 1.92, C.I. 1.16-3.19). There was no clear correlation between Zs of annulus and Valsalva (r2=0.327), and neither greater Zs of Valsalva nor Marfan syndrome was significant risk factors. Even though AR grade is mild or less, 2 events were seen out of 5 when Zs of Valsalva is greater than 10.

CONCLUSIONS) VSARR resulted in satisfactory mid-term outcomes even in Marfan, provided proper patient selection. However, VSARR should be carefully indicated in cases with greater AR and larger annulus, and even in milder AR cases, larger Valsalva might lead to worse long-term prognosis.

O12-3

IMPACT OF CONCOMITANT ASCENDING AORTIC REPLACEMENT FOR AORTIC VALVE REPLACEMENT FROM COMPARISONS WITH ISOLATED AORTIC VALVE REPLACEMENT

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Objective: To evaluate the influence of concomitant ascending aortic replacement (AAR) for aortic valve replacement(AVR).

Methods: We retrospectively reviewed 53 consecutive patients who underwent AVR and AVR with AAR between 2010 and 2012. Re-do cases and AVR cases with stentless valve were excluded. AVR was performed for 42 patients (group AVR, mean age 72.7 ± 10.7) and AVR with AAR were performed for 12 patients (group AVR+AAR, mean age 62.8 ± 10.7, $p<0.01$). In AVR+AAR group, 5 patients underwent AAR with deep hypothermia with circulatory arrest and 7 patients with moderate hypothermia with selective antegrade cerebral perfusion. Mean ascending aortic diameter in group AVR+AAR was 45.5 ± 3.2 mm.

Results: No patients died or major neurological defects occurred. The duration of aortic cross clamp time(AoX) and cardiopulmonary bypass time(CPB) were significantly longer in group AVR + AAR (group AVR vs group AVR + AAR, Aox: 88 ± 22 vs 128 ± 22 minutes, $p<0.01$; CPB: 129 ± 29 vs 177 ± 21minutes, $p<0.01$). However, there were no significant differences in the duration of mechanical ventilation, ICU stay and hospital stay between the groups. (8.8 ± 5.7 vs 10.3 ± 6.1 hours, $p=0.45$, 2.4 ± 1.7 vs 2.6 ± 1.7 days, $p= 0.95$ and 15.7 ± 9.5 vs 15.2 ± 4.3 days, $p=0.86$, respectively).

Conclusions: Simultaneous concomitant ascending aortic replace for AVR candidates with ascending aortic aneurysm would be acceptable. This strategy could avoid late re-do ascending aortic replacement especially for younger AVR candidates with mildly dilated ascending aorta.

O12-4

REDO AORTIC ROOT REPLACEMENT AFTER AORTIC ROOT OPERATION

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OBJECTIVE:
With the increasing use of biologic conduits or bioprosthetic valve, the number of patients who require redo aortic root replacement increased. We review our experiences of this technical challenging case.

METHODS:
Between January 1990 and September 2012, 14 patients underwent redo aortic root replacement. The mean age was 61.9 + 14.8 years, and five males were included. There were three Marfan syndrome patients.
The mean EuroSCORE and logistic EuroSCORE were 12.4 + 3.5 and 37.1 + 22.7%, respectively.
Previous operations were aortic valve replacement using stentless bioprosthesis (n = 7) and Bentall operation (n = 7). The operation interval was 5.4 + 6.4 years.
Indication for redo operation included structural valve deterioration (n = 6), prosthetic valve endocarditis (n = 4), perivalvular leakage (n = 2), dilatation of sinus of Valsalva (n = 1) and dehiscence of proximal anastomosis line (n = 1).
Mean follow-up period was 5.3 + 5.2 years.

RESULTS:
Present operations were aortic valve replacement using stentless bioprosthetic valve (n = 5) and Bentall operation (n = 9).
Aortic clamp time and cardiopulmonary bypass time were 237.3 + 90.6 and 343.5 + 107.5 minutes, respectively. At re-sternotomy, we required deep hypothermic circulatory arrest in five. Of five, we experienced aortic injury in one.
There was one in-hospital death (7.1%) caused by arrhythmia. Postoperative complications included implantation of permanent pacemaker (n = 3), arrhythmia (n = 2) and re-intubation (n = 1). During follow-up period, one patient died due to chronic heart failure. The 5-year survival was 92.9±6.9%. Freedom from redo aortic operation at 5 years was 100%.

CONCLUSION:
Redo aortic root operation can be performed with acceptable in-hospital mortality and good late survival.

O12-5

LONG TERM RESULTS OF VALVE-SPARING AORTIC ROOT RECONSTRUCTION

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Objectives: We evaluated the early and late clinical outcomes of valve-sparing aortic root reconstruction in patients with the various types of aortic root disease.

Methods: Between June 1996 and November 2012, nineteen patients who underwent valve-sparing aortic root replacement for aortic root disease were retrospectively reviewed. Mean age was 44 ± 17 years. 9 patients had Marfan syndrome and one patient had Takayasu's arteritis. All patients, except one with bicuspid valve, had the tricuspid aortic valve. In the preoperative echocardiography, more than moderate degree of aortic regurgitation (AR) was identified in 13 patients. 15 patients were diagnosed with annuloaortic ectasia, 2 with ascending aorta aneurysm, and 2 with acute Type A aortic dissection. Reimplantation of aortic root was performed in 11 patients and remodeling techniques in 8. Mean follow up duration was 80.8months.

Results: There were no operative mortality and one late-death. Survival of total patients at 10 years was 83.3 ± 15 %. There was no major complication related to operation. There was no reoperation related to the AR progression or aortic root procedure itself. Moderate aortic regurgitation developed in 6 patients during the follow up periods, but there was no severe regurgitation. Freedom from moderate or severe AR at 10 years was 73.5 ± 13.9 % for all patients. There was no significant difference in AR progression rate according to the type of procedures (reimplantation vs. remodeling, 85.7 ± 13.2 vs. 71.4 ± 17.1 %, p=0.264).

Conclusions: Aortic valve-sparing aortic root reconstruction including both implantation and remodeling technique provides the good clinical outcomes and is associated with low rates of valve related complications.

O12-6

BRANCHED GRAFT INVERSION TECHNIQUE FOR DISTAL ANASTOMOSIS IN ASCENDING AORTA REPLACEMENT

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OBJECTIVE:
Different types of cerebral protection are selected partly depending on the time required for open distal anastomosis for acute aortic dissection. If the time is less than 20 minutes, moderate hypothermia alone is enough for brain protection, as offered in the LIQR (less invasive quick repair) technique. Our current method of distal anastomosis, the branched graft inversion technique(BGI technique), offers easy and secure distal anastomosis, resulting in short duration of circulatory arrest.
METHODS: We use one-branched Triplex graft (TERUMO). Cut the graft and the branch for arterial perfusion to optimal length. Using forceps, invert the graft completely. After circulatory arrest, the inverted graft is carefully inserted into the ascending aorta. Distal anastomosis is performed using 3-0 polypropylene running sutures buttressed with a Teflon felt strip outside the aorta. Then inverted graft is pulled up proximally. The soft plaques are flushed out by means of retrograde aortic perfusion from the femoral artery. Finally, the proximal anastomosis is performed after initiation of antegrade aortic perfusion from the graft branch.
RESULTS Using this BGI technique for emergency ascending aortic replacement for aortic dissection, distal anastomosis were completed in 20minutes in most of the cases. There have been no reoperations for bleeding or false aneurysm.
CONCLUSIONS: Our technique offers easy and secure distal anastomosis, completing distal anastomosis and reinforcing the aortic stump simultaneously, resulting in shorter durations of circulatory arresting time. As a conclusion, this BGI technique could be useful in performing ascending arch replacement.

O13-1

CEREBRAL OXYGEN DESATURATION IMMEDIATELY AFTER REWARMING PREDICTS DELAYED WAKENING AFTER TOTAL AORTIC ARCH REPLACEMENT

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Backgrounds: Rewarming phase after hypothermia in aortic arch surgery is a period when cerebral oxygen decreases responding to metabolically hyperactivity of the brain. We hypothesized that this phenomenon might be related to possible postoperative neurological disturbance. The impact of the regional cerebral oxygen saturation (rSO2) on postoperative wakening after total aortic arch replacement (TAR) was also investigated.

Methods: From June 2008 to December 2011, 101 consecutive patients with a mean age of 71 ± 13 years underwent TAR using moderate hypothermia with selective antegrade cerebral perfusion (Male 78, Female 23). The rSO2 was monitored using near-infrared spectroscopy. Decrease of rSO2 immediately after rewarming, `%-D`, was calculated according to the following formula;

%-D = rSO2(X1) - rSO2(X2) / rSO2(X1)

X1, time at the commence of rewarming,

X2, 10 minutes after the commence of rewarming.

Delayed wakening was defined as the patients do not wake up more than 6 hours after the termination of anesthesia.

Results: Two patients died in hospital because of colon necrosis and sepsis. Average time to wake up was 4.0± 4.9 hours. Nine patients (8.9 %) showed delayed wakening (delayed-group). %-D showed a positive linear relationship to wakening time (%-D; y=0.8x-2.0, r=0.3, p<0.001) and ROC analysis showed that %-D had a good predictive value for delayed wakening (AUC=0.94). The best cutoff value for predicting delayed wakening was 4.6 %. Mean %-D was 1.0±5.4 % and significantly different between the delayed-group and the normal group (%-D; 9.4±4.4 vs. 0.1±4.8 %, p<0.001). Ten patients had TND (9.9 %) and 2 patients had PND (2.0 %). TND was significantly higher in the delayed-group than in the normal group (p=0.04), while PND was not significantly different between these two groups (p=0.12).

Conclusion: Cerebral oxygen desaturation immediately after rewarming might predict delayed wakening after TAR.

O13-2

TOTAL AORTIC ARCH REPLACEMENT IN OCTOGENARIANS

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Objective: We performed this retrospective study to investigate the impact of octogenarians on outcomes after total aortic arch replacement (TAR).

Methods: From January 2002 to May 2011, 340 consecutive patients underwent TAR through a median sternotomy using antegrade selective cerebral perfusion. Of this number 273 (80.3%) patients were less than 80 years old (group NO) and 67 (19.7%) patients were octogenarians (group O). Patients in group O were older and had more incidence of ruptured aneurysm and deteriorated left ventricular function and less incidence of acute type A dissection.

Results: Hospital mortality (HM) was 3.3% (9/273) in group NO and 9.0% (6/67) in group O (p=0.047). Multivariate analysis showed that acute type A aortic dissection with organ malperfusion (OR 12.8, p=0.02), emergent/urgent operation (OR 6.8, p=0.03), chronic kidney disease (eGFR<30) (OR 5.0, p=0.04), and operation time (OR 1.01, p=0.03) were risk factors for HM, but failed to demonstrate octogenarians as a risk factor (OR 2.9, p=0.053). Operation performed after year 2006 was a risk reduction factor (OR 0.15, p=0.008). After 2006 HM in group O was drastically ameliorated (2.4% vs. 20%, p=0.01). However, group O had more postoperative tracheostomy (NO : 17 (6.3%), O : 9 (13.4%); p=0.05) and bowel necrosis (NO : 1 (0.4%), O : 2 (3.0%); p=0.04). Survival at 5 years in group NO and group O were 79.0 ± 3.9 % vs.45.9 ± 10.1 %, respectively (p <0.0001).

Conclusions: The outcome of TAR in octogenarians has been improving. However, octogenarians are associated with more morbidities, which may still deserve special attention.

O13-3

SURGICAL OUTCOME OF SIMPLIFIED UNILATERAL ANTEGRADE CEREBRAL PERFUSION WITH MILD TO MODERATE HYPOTHERMIC CIRCULATORY ARREST

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OBJECTIVE: We incorporate a simplified unilateral antegrade cerebral perfusion technique with mild to moderate hypothermia during circulatory arrest. The aim of the present study is to review the results of our technique.

METHODS: Between January 2005 to October 2012, 43 patients with a mean age of 62 ± 11 years (33 male) who underwent aortic surgery with this technique were enrolled retrospectively. Of these, 11 patients required emergency operations for acute type A aortic dissection. For antegrade cerebral perfusion, a balloon tipped 15 Fr catheter, designed for retrograde cardioplegia administration, was directly inserted into the brachiocephalic artery and secured with a tourniquet around the base of the artery. Blood at temperatures of 25-30°C was delivered antegrade. Operative and early postoperative outcomes were investigated.

RESULTS: Operations performed were ascending aorta replacement in 6 and ascending and hemi-arch aorta replacement in 37. Operations combined were Bentall's procedure in 14, aortic valve replacement in 7 and coronary artery bypass surgery in 8. The lowest temperature during circulatory arrest was 25°C in 10, 28°C in 20, 29°C in 6 and 30°C in 7. The mean circulatory arrest time was 18 ± 5 mins (12-39 min.). No mortality or permanent neurological deficits were noted. One patient had a temporary neurological deficit. Four patients developed acute kidney injury, one of whom required temporary dialysis. Reexploration for bleeding was required in 6 patients.

CONCLUSIONS: Replacement of the ascending and hemi-arch aorta can be performed safely with unilateral cerebral perfusion at mild to moderate hypothermic circulatory arrest with low morbidity and mortality.

O13-4

AORTIC ARCH REPLACEMENT USING SPIELVOGEL TECHNIQUE IN PATIENTS WITH AORTIC ARCH ANEURYSM

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Objective: There are various surgical strategies for brain protection in aortic arch surgery. We used Spielvogel's trifurcated-graft technique to minimize manipulation of arch vessels and to perfuse brain unilaterally after a brief circulatory arrest.

Methods: From 2005 to 2012, 30 patients with aortic arch aneurysm underwent surgery using Spielvogel technique. In all cases, the right axillary artery was cannulated as perfusion source. Arch vessel anastmosis using trifurcated graft was performed first. In most cases, innominate arteries were anastomosed initially to start unilateral antegrade brain perfusion. After anastomosis of the left subclavian and left common carotid arteries, bilateral antegrade brain perfusion was resumed. Then, the aortic arch and ascending aorta were reconstructed. After distal anastomosis to the descending thoracic aorta, distal perfusion was resumed through the bridge graft. Finally, the trifurcated graft was anastomosed to the main graft.

Results: Patients had variable types of aneurysm; fusiform, 16 (53.3%); saccular, 8 (26.7%), mycotic, 4 (13.3%). Six (20.0%) were ruptured aneurysms. Duration of total circulatory arrest and antegrade brain perfusion (min) were 11.2±7.4 (1-26), and 81.0±19.4 (40-125), respectively, and the lowest cerebral oximeter value (%) was 54.7±13.6 (21-86) for the left side and 53.4±11.7 (29-72) for the right side. There was no major postoperative neurologic deficit, and 2 early deaths occurred due to sepsis and ARDS. Two late deaths were due to cancer and ischemic cardiomyopathy.

Conclusions: With Spielvogel technique, manipulation of the arch vessels could be minimized, and antegrade brain perfusion was established in adequacy. Surgical access to the distal aortic anastomosis site was easy and safe using this technique. Distal ischemic time could be reduced with perfusion via bridge graft. Spielvogel technique is safe and reproducible in aortic arch surgeries..

O13-5

AORTIC ARCH SURGERY IN OCTOGENARIANS: IS IT JUSTIFIED?

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Objective

Elderly patients might be denied aortic arch surgery because of the perception of poor outcomes and unacceptable quality of life (QOL). In this study, we evaluated short and mid-term survival and quality of life in octogenarian patients.

Method

Forty-nine consecutive patients older than 80 years were referred to 2 institutions. Among these, 20 underwent surgical intervention (the surgical group), and 29 were treated medically (the medical group). Kaplan-Meier survival analysis was performed, and QOL was assessed using the short form-36 surveys, the results of which were compared with those of age-matched populations. Risk factors for mortality were determined using Cox regression analysis.

Results

Patients' characteristics at baseline were not significantly different between two groups, i.e., the surgical and medical groups. In the surgical group, total aortic arch replacement was performed in 15 patients, debranched thoracic endovascular aortic repair (TEVAR) in 2, and Chimney TEVAR in 3. Hospital mortality after surgical intervention was 0%, and no major postoperative complications were observed. Five-year survival was 61.5% in the surgical group, whereas 13.6% in the medical group ($p = 0.02$). Freedom from aorta-related death at 5 years was 92.3% in the surgical group and 32.4% in the medical group ($p = 0.01$). No differences were observed in 5-year survival between patients undergoing surgical intervention and that of the age matched population. The risk factor for mortality for aortic arch disease was observed in patients treated medically alone. Among the mid-term survivors, QOL measures were equivalent to those of the general elderly population, and those in the surgical and medical groups were similar.

Conclusions

Surgical intervention for aortic arch disease in octogenarians can yield satisfactory clinical outcomes and mid-term survival with adequate daily activity. This study indicates that age alone should not be considered for disqualifying aortic arch intervention in octogenarian patients.

O13-6

IMPACT OF HYBRID THERAPY FOR AORTIC ARCH ANEURYSM

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Objective:
Open surgical repair is a gold standard for aortic arch surgery, however, TEVAR is a promising therapy especially for elderly patients. We have applied hybrid therapy for aortic arch surgery principally for over 75 years old cases since 2010. We evaluate impact of hybrid therapy to improve clinical outcomes in aortic arch surgery.

Methods:
There are 239 elective surgical cases of non-dissected aortic aneurysm since 1997 to 2012. Commercially available TEVAR has been used since 2008. Hybrid therapy has been applied routinely since 2010. Early clinical results were compared between early (1997-2009) and recent phase (2010-12). There were total arch replacement (TAR) via midsternototmy in 153, TAR via L shape incision in 27, Frozen elephant trunk (FET) in 30, long elephant trunk (LET) + TEVAR in 20 and debranching TEVAR in 9. Hybrid therapy including LET + TEVAR and debranching TEVAR were 29 cases, which were 1% in early and 34% in recent phase.

Results:
The rate of hospital death, stroke and paraplegia were 1%, 2%, 1% in TAR, 0%, 7%, 4% in L shape, 7%, 7%, 23% in FET, 6%, 24%, 0% in LET+TEVAR, and 11%, 33%, 0% in debranching TEVAR. FET showed hyper paraplegia rate and hybrid therapy showed higher stroke rate. The rate of hospital death, stroke and paraplegia were 3%, 6%, 3% in 1997-2009 and 1%, 8%, 5% in 2010-2012. There were no improvement between them.

Conclusion:
TAR is still gold standard for arch surgery. Hybrid therapy showed acceptable early results even for elderly patients and high risk patients. However, its indication should be considered carefully because TAR is an established therapy.

O14-1

IMPACT OF SEVERE ATHEROSCLEROSIS ON SURGICAL OUTCOMES OF THE THORACOABDOMINAL AORTIC ANEURYSM REPAIR

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Objective) Severe atherosclerosis is often observed in aortic aneurysmal disease. We examined the impact of severe atherosclerosis on surgical outcomes of graft replacement of thoracoabdominal aortic aneurysm. Method) From September 1999 to October 2012, 164 patients who underwent 42 descending thoracic aorta aneurysm or 122 thoracoabdominal aortic aneurysm repair (Crawford classification I/II/III/IV: 16/34/62/10) were studied. The severely atheromatous component was observed in 30 patients. We compared the surgical outcomes between patients with (Group A) and without the severely atherothrombotic component (Group B). Surgery consisted of distal perfusion, aggressive segmental arteries (SAs) reattachment, and the use of cerebrospinal fluid drainage. Intraoperative Spinal cord function was monitored by using motor evoked potentials (MEPs). If MEP shows the sign of spinal cord ischemia during aortic cross-clamping, we perform counter maneuvers such as controlling back bleeding from segmental arteries (SAs), augmentation of distal perfusion pressure, SAs perfusion, or SAs reattachment. Results) Hospital mortality occurred in 15 patients, 16.7% (5/30) in group A and 7.5% (10/134) in group B (P=.22). Spinal cord ischemia (SCI) occurred in 14 patients, 30% (9/30) in group A and 3.7% (5/134) in group B. The incidence of ischemic sign of MEPs during aortic cross-clamping in group A was 36.7% (11/30), which was significantly higher than group B 19.4% (26/134) (p=.02). The recovery from ischemic sign in group A after counter maneuvers was 36.3% (4/11), significantly lower than group B 80.8% (21/26) (P=.02). All these 7 patients with persisted ischemic sign in group A had spinal cord ischemic injury postoperatively. Multivariate analysis demonstrated that the risk factors for SCI were the severe atherosclerosis (odds ratio, 5.1). Conclusions) Severe atherosclerosis was the risk factor for spinal cord ischemia in our surgical experiences of TAAA repair.

O14-2

VISCERAL PATENCY IN FENESTRATED STENT GRAFTING FOR ABDOMINAL AORTIC ANEURYSM REPAIR; A SEARCH FOR FACTORS THAT MAY AFFECT OUTCOME

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Objectives: Fenestrated endovascular abdominal aortic aneurysm repair (F-EVAR) has been introduced for the treatment of aneurysms in which visceral arteries are involved. In this study the results of polytetrafluoroethylene (PTFE)-covered stents to accommodate visceral arteries in F-EVAR are presented.

Methods: All patients treated with fenestrated stent grafts in one single centre between November 2001 and October 2011 were reviewed. Results of three different types of stents for the visceral arteries were compared, including a bare metal stent and two types of PTFE-covered stents. Primary endpoints were occlusion and >50% diameter reduction of the stent or target vessel. Secondary endpoints were kinking of the stent, fracture, luxation, and morbidity and mortality.

Results: 138 patients (median age 73 years) were included. Median CTA follow-up was 13 (range 0-97) months. In total 392 target vessels were provided with 140 scallops and 252 fenestrations. Stents were placed in 254 target vessels. Technically successful stent placement was obtained in 249 arteries (98.0%). Target vessel patency was 90.0% at one, 89.0% at two, and 77.7% at four years. Stent patency was 86.1% at one, 84.5% at two, and 66.0% at four years. The primary patency rate of PTFE covered stents was 89.9% at one, 87.3% at two and 79.9% at four years. For bare metal stents this was 83.9%, 83.9% and 54.2%, respectively. There was no significant difference in primary patency between PTFE covered stents and bare metal stents (P=.08).
Kinks and fractures of the visceral stent (-grafts) significantly reduced visceral artery patency rate (P<.01).

Conclusion: Loss of visceral stent patency after F-EVAR is associated with renal function loss and bowel ischemia. Stent fracture occurred more in bare metal. PTFE covered stents may improve patency rates on the long term, but did not significantly improve patency rates compared to bare metal stents in this study.

O14-3

DOUBLE TRACT TECHNIQUE FOR REATTACHMENT OF THE INTERCOSTAL ARTERIES DURING THORACOABDOMINAL AORTIC ANEURYSM REPAIR

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Objective;

To evaluate the result of our novel technique for reattachment of the intercostal arteries (ICAs) during thoracoabdominal aortic aneurysm (TAAA) repair.

Methods;

The ICAs were reattached to the 9-10mm side branch with side-to-side anastomosis and distal end of the side branch was connected to the main graft as double tract. Sequential anastomosis was undergone when multiple reattachments of the ICAs were applied. Sequence of the reconstruction was unrestricted. Since 2008, 18 patients (aged 64 ±12 years) underwent reattachment of the ICAs with this technique. Three patients were diagnosed as Marfan syndrome and 12 patients had aortic dissection. According to the Crawford classification, extent of the aneurysm was 11 in type I, 3 in type II and 4 in type III. Motor evoked potentials were monitored for all patients and spinal drainage was applied for 16 patients. Open proximal method with deep hypothermia was performed in 7 patients.

Results;

1.8±0.9 pair of the ICAs was reattached. Reattachment of the ICAs were done before distal aortic reconstruction in 6 patients and after in 12 patients. There was no hospital mortality. No patients sustained transient or permanent paraplegia in the postoperative or follow up period. Follow up CT scan angiography demonstrated that all side branches for reattachment of the ICAs were patent except one patient. Patency rate of the reattached ICAs were 90.1% (30 / 33).

Conclusions;

Double tract technique brings flexibility of the graft and makes anastomosis easier. And it also brings flexibility of the sequence of reconstruction of the aorta. Creation of the outflow of the side branch may contribute to the patency of the graft and reattached intercostal arteries. We believe that this method is useful for spinal cord protection during thoracoabdominal aortic aneurysm repair.

O14-4

OPEN SURGICAL REPAIR OF ANEURYSMS OF THE THORACOABDOMINAL AORTA USING MULTIDISCIPLINARY APPROACH FOR SPINAL CORD PROTECTION

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OBJECTIVE: Spinal cord deficit is the most devastating complication in surgery for thoracoabdominal aortic aneurysms (TAAA). As cause of neurological deficit is multi-factorial, we have applied multiple adjuncts including regional spinal cord cooling during aortic cross-clamping. The purpose of this paper is to review outcome of our recent open surgery for TAAA.

METHODS: Forty-eight patients (36 men and 12 women; age, 22-80 years) who underwent open surgery for TAAA were enrolled. Etiology was dissection (n=33) and non-dissection (n = 15). Six patients were Marfan syndrome. Twenty patients had a history of prior aortic surgery. Extent of TAAA was Crawford type I (n=2), II (n=21), III (n=21) and IV (n=4). All patients underwent surgery using a branched graft under moderate hypothermia with distal perfusion. Preoperative identification of Adamkiewicz artery by computed tomography, intraoperative MEP monitoring, cerebrospinal fluid drainage, sequential aortic clamping and reconstruction of critical segmental arteries were applied whenever possible. Proximal aorta was clamped proximal to the left subclavian artery in 11 patients. Selective visceral organ perfusion was done in 47 patients. Regional spinal cord cooling using a custom-designed counter-current closed-lumen epidural catheter and selective perfusion of segmental arteries were applied in 24 and 3 patients, respectively.

RESULTS: Two patients died of respiratory failure and multiple embolization before discharge (hospital mortality, 4.2%). Postoperatively tracheotomy and temporary / permanent hemodialysis were necessary in 3 and 4 patients, respectively. All patients were free from neurological deficit.

CONCLUSIONS: Surgery for TAAA with multi-disciplinary approach to protect spinal cord achieved excellent outcome with no spinal cord deficit. Although our patient cohort was small, the clinical application of regional spinal cord cooling system might play a certain role as an additional protection against paraplegia. Further clinical trials are warranted to confirm that this technique protects against paraplegia during surgery for TAAA.

O14-5

A NOVEL TECHNIQUE TO IDENTIFY A CRITICAL INTERCOSTAL ARTERY FOR SPINAL CORD PROTECTON DURING THORACOABDOMINAL AORTIC ANEURYSM REPAIR

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Objective: Preoperative identification of the Adamkiewicz artery is not always practicable. Intraoperative monitoring of motor evoked potential is not consistently reliable to indicate a perfusion status of the spinal cord during thoracoabdominal aortic repair. We invented a novel system consisted of a direct monitoring of cerebrospinal fluid (CSF) temperature and differential selective hypothermic intercostal artery perfusion (D-HIAP).Methods: After exposing a preoperatively diagnosed critical intercostal artery (ICA), a 10 mm prosthetic vascular graft was anastomosed in an end to side fashion. A balloon-tipped 12 Fr catheter was inserted into the graft to perfuse with 15 degree Celsius blood. D-HIAP perfusion pressure was adjusted to the systemic mean arterial pressure, which enabled us to measure a perfusion flow rate on an individual ICA. When an orifice of an ICA had been occluded, neighboring ICAs were perfused in the same fashion as above. Serial monitoring of the CSF temperature was performed. We have performed the D-HIAP in consecutive 10 patients.Results: Significant temperature drop (5.2+1.1 degree Celsius, $p<0.05$) was recorded within 5 minutes after initiation of D-HIAP when the critical ICA was perfused, whereas non-critical ICA perfusion did not yield a significant change in CSF temperature. Conclusions: The detection of a disparity in temperature between CSF and blood generated by D-HIAP enables us; 1) to confirm a preoperatively identified Adamkiewicz artery, 2) to identify a major collateral source to the spinal cord when an orifice of a critical ICA is occluded, and 3) to enhance spinal cord protection with regional hypothermia.

O14-6

ANALYSIS OF INTERCOSTAL ARTERY RECONSTRUCTION IN THORACO-ABDOMINAL AORTIC ANEURYSM

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Objective: Reconstruction of intercostal arteries in thoraco-abdominal aortic aneurysm is important for spinal protection. Preoperative diagnosis with magnetic resonance imaging and intra-operative motor evoked potentials is often used to detect adamkiewicz artery. However, the reconstruction strategy may differ among surgeons. The purpose of this study was to analyze the effect of three different procedures that have been performed in our institution.

Methods: From October 2005 to May 2012, 43 patients underwent open surgery for thoraco-abdominal aortic aneurysm in our institution. Among 43 patients, reconstructions of the intercostal arteries were performed in 28 cases. Reconstruction of the intercostals artery with a branched prosthetic graft were performed in 15 cases (Group A). Reconstruction by suturing the resected posterior aortic wall to the side of the prosthetic graft were performed in 5 cases (Group B). Reconstruction by replacement of the anterior wall of the aneurysm with the prosthetic graft was performed in 8 cases (Group C). Surgical outcome, occurrence of paraplegia, and patency of reconstructed arteries were analyzed.

Results: There were 7 patients with marfan syndrome, and 18 with chronic aortic dissection. There were 2 in-hospital deaths. The mean numbers of reconstructed arteries were 2.60 in group A, 2.40 in group B, and 1.63 in group C. The patency of reconstructed arteries at one week after the surgery was 21% in group A, 100% in group B, and 93% in group C. Transient paraparesis was observed in two patients, one in group A, and one in group C. The aneurysm formation at the site of reconstruction was observed in 50% of the patient in group B and 70% of the patient in group C.

Conclusion: Although group B and C showed outstanding patency of the reconstructed intercostal arteries, there is a risk of aneurysm formation at the reconstruction site.

O15-1

COMPLETE RING VERSUS POSTERIOR ANNULOPLASTY BAND IN BARLOW DISEASE

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Objective: to compare clinical outcomes and echocardiographic results after mitral valve repair using complete ring and posterior annuloplasty band in patients with Barlow disease.

Methods: Since 2011 till present day we perform 23 mitral valve repairs in Barlow disease (repair rate 96%). Data is collecting prospectively; all patients have been randomized into following groups: annuloplasty with complete rings (12patients) or posterior band (11patients). Both groups were comparable for age, sex, height, weight, BMI, BSA, NYHA functional class, LV EF, heart rhythm, comorbid conditions, and operative techniques.

Results: There was no hospital mortality. One patient with repair failure (Group 2) was excluded from study. One patient (Group 2) with robot-assisted mitral valve repair using posterior band have complicated to SAM-syndrome and undergo re-repair without conversion surgical approach. In both groups at discharge were significant LA reduction, LV end systolic and diastolic dimension decrease, LV end systolic and diastolic volume decrease. We have no residual mitral regurgitation at discharge. Follow up in progress…

Conclusions: complete ring and posterior annuloplasty band implantation in patients with Barlow disease have comparable results at discharge. There was no statistically significant difference in pre- and postoperative period from one group to another. The use of large diameter of annuloplasty rings allow to achieve excellent hemodynamic results regardless to the MV repair method used (type of rings, minimally invasive or standard approach). Longer follow-up are required.

O15-2

MINIMALLY INVASIVE STERNAL SPARING DIRECT ACCESS DOUBLE VALVE REPLACEMENT

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Minimally Invasive, Direct, Sternal sparing approach double valve replacement.

OBJECTIVE:

Minimally invasive approach for surgical treatment for heart valve disease is not new. Use of totally endoscopic robotic assist approach has been limited by the cost involved, minimally invasive technique is our preferred method for last few years. We present our experience of 40 cases of double valve replacement with minimally invasive, direct approach through a small thoracotomy.

METHODS:

40 patients underwent minimally invasive double valve surgery from march 20009 through octl 2012.The surgical approach is through a small (3.0 inch) lateral thoracotomy through the right third /second intercostal space. Femoral arterial and venous cannulation is used for cardiopulmonary bypass (CPB).

RESULTS:

The difference in average CPB and aortic cross clamp times are not significantly different as compared to conventional sternotomy approach for any subgroup of procedures. The average intensive care (ICU) stay, hospital stay, and transfusion requirement are significantly less ($p<0.001$ for all parameters for all subgroups). There is no wound infection and mortality in this group.

The cosmetic results and lower loss of man work hours is an extremely important advantage of this approach especially for young female patients.

The cost of the small initial investment of surgical equipment is offset by the short ICU and hospital stay as well as lower transfusion and antibiotic requirement.

CONCLUSION:

The minimally invasive, direct approach for heart valve procedures is safe, reproducible, inexpensive and cosmetically superior. It is the imminent gold standard for both developing and developed nations.

O15-3

DOUBLE-LAYERED PERICARDIAL PATCH TECHNIQUE IN RECONSTRUCTION OF THE INTERVALVULAR FIBROUS BODY DURING COMPLICATED LEFT-SIDED VALVE SURGERY

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(OBJECTIVE) This study was undertaken to evaluate the outcomes of reconstruction of the intervalvular fibrous body with double-layered equine/bovine pericardial patch during left-sided valve surgery. (METHODS) Six consecutive patients underwent reconstruction of the intervalvular fibrous body during aortic valve replacement with mitral valve replacement or repair. There were four men and two women whose mean age was 63 ± 17 years. Concomitant procedures were coronary bypass grafting in 2, tricuspid valve repair in 2, permanent pacemaker implantation in 2. Indications for this procedure were extensive abscess with active infective endocarditis in 3, lack of adequate tissue to secure prosthetic valves in 2, extensive calcification of the intervalvular fibrous body in 1. Four patients had undergone one or more previous valve operations. The operative technique was follows: after radical resection of severely damaged fibrous body, reconstruction was achieved by suturing double-layered xenogeneic pericardial patch to the lateral and medial fibrous trigons. The outer layer of the patch was used to close the dome of the left atrium, while the inner patch was used to reconstruct the aortic root. The patch replaced the anterior part of the mitral annulus, the intervalvular fibrous body and the non-coronary part of the aortic annulus. (RESULTS) There were two operative deaths. Postoperative echocardiographic assessment revealed no procedure-related complication such as para-valvular leakage and prosthetic valve endocarditis. (CONCLUSION) Although reconstruction of the intervalvular fibrous body during left-sided valve surgery is a technically demanding procedure, this technique is useful and safe for patients with destroyed fibrous body. The use of double-layered pericardial patch is timesaving and advantageous for hemostasis.

O15-4

SURGICAL TREATMENT FOR AORTIC ROOT ABSCESS IN PATIENTS WITH ACTIVE INFECTIVE ENDOCARDITIS

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(OBJECTVE)Aortic root abscess has been one of the most challenging surgical treatments in active infective endocarditis (IE), which need complete resection of infective tissue following proper reconstruction of outflow of the left ventricle.

(PATIENTS)From June of 2004 to February of 2012, we experienced 12 cases (33 %) with root abscess cases in 36 active IE in the aortic valve positions. Indications of emergency were uncontrollable hear failure in one case, uncontrollable infection and/or recurrent distal embolization under antibiotics in the other seven cases. Organisms were revealed in 8 cases (alpha-streptococcus in 3, staphylococcus in 3, MRSA in 2).

(PROCEDURES and RESULTS)Surgical procedures were verified depending upon progression of infection. AVR with reconstruction of aortic root with autologous or xenogeneic pericardium were performed in 7 cases. Root replacement was required in one case with aortic reconstruction using xenogeneic pericardium. Monobloc AVR+MVR was required in one case. AVR and MVP with reconstruction of aorto-mitral continuity was performed in two cases. One case with preoperative multiple embolization of MRSA IE was died from acute heart failure due to mediastinitis about one month after operation. One case with deep infection of ventricular septum was developed LV-RV fistula, which was repaired with modified Konno method in 2 months after the operation under stable condition without infection. The other patients were all stable without any sign of infection with good prosthetic function.

(CONCLUSION)Aortic root abscess with active IE would require unhesitating surgical procedure with aggressive and complete resection of infective tissue for rescue from catastrophic situations.

O15-5

SIZE OF RIGHT VENTRICLE IN PATIENTS WITH LATE ISOLATED TRICUSPID REGURGITATION PREDICTS 1 YEAR OUTCOME AFTER SURGERY

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Objective: After left sided heart valve surgery, progressive worsening of isolated tricuspid regurgitation would require valve repair or replacement. Usually when patients become very symptomatic. No specific prognostic factor in this situation identified and assessment of right heart function is difficult. This study aimed to predict surgical outcome by using right ventricular size obtained from computed tomography (CT) or magnetic resonance imaging (MRI).

Methods: Patients underwent isolated tricuspid surgery were enrolled. All of them had routine workup and size of right ventricle was assessed by either CT or MRI before operation. Primary end-point was survival and symptomatic improvement at 1 year follow up.

Results: From Jan 2005 to December 2011, 35 patients had either isolated tricuspid valve repair or replacement performed. There were 19 patients in the favorable group (survivor with at least 1 NYHA class improvement) and 16 in the unfavorable group (non-survivor or survivor with no symptomatic improvement). All the baseline characteristics, echocardiogram data and surgical details were comparable between the 2 groups. Right ventricular size presented as end-systolic volume (ESV), indexed end-systolic volume (iESV), end-diastolic volume (EDV) and indexed end-diastolic volume (iEDV) were significantly different between the 2 groups. Patients had iESV > 88ml/m2 or iEDV > 194ml/m2 pre-operatively likely to have unfavorable surgical outcome (Sensitivity of 62.5% and 50%, specificity of 78.9% and 89.5% respectively).

Conclusions: Right ventricular sizes can predict surgical outcome in patient underwent isolated late tricuspid regurgitation. Operation should not be delayed until severely dilated right ventricle in order to have favorable surgical outcome.

O15-6

DEVELOPMENT OF THE PERCUTANEOUS TRICUSPID VALVE OCCLUDER

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OBJECTIVE: There has been a great tendency towards minimally invasive techniques that aim to reduce morbidity and mortality in the cardiac surgical field. We developed a prototype percutaneous tricuspid valve occluder (TVO) for valve insufficiency. This research evaluated the new approach and the efficacy of TVO in an acute tricuspid regurgitation (TR) model.

METHODS: After general anesthesia, the pig (body weight 28.8 kg) was monitored by arterial pressure, central venous pressure and electrocardiogram. The TR was created by cutting the chordae tendineae in the right ventricle (RV) with a biopsy forceps (BIOPAL, Cordis, Corp., FL, US) under the fluoroscopy. During the creation of the TR animal model, epinephrine (7-30 μg/min/kg) with dopamine (1.0 μg/min/kg) was administered intravenously to sustain the animal. The TVO was deployed via the sheath under the fluoroscopic guidance. TVO consists of anchoring screw, occluder and adjustment handles, and the anchoring screw is fixed at the RV and the occluder is deployed above the tricuspid valve. Amplazer septal occluder (St. Jude Medical, Inc., MN, US) is modified for the part of the occluder. The screw and occluder shape can be adjusted using the device handle. For the deployment of the biopsy forceps and TVO in the RV, the 16 Fr long sheath was inserted to the right jugular vein.

RESAULTS: Epicardial echocardiography revealed that the TVO reduced the TVR from 4+ to 1+. In the postmortem evaluation, the chordae tendineae was ruptured, and the occluder was located above the tricuspid valve. The RV was not ruptured by the anchoring screw.

CONCLUSION: The acute TR animal was created by biopsy forceps under the fluoroscopy. The TVO was successfully used for the TR as the minimally invasive therapy.

O15-7

IMPACT OF LEFT VENTRICULAR VOLUME AFTER REPAIR OF ISCHEMIC MITRAL REGURGITATION -RELATIONSHIP BETWEEN SURGICAL OUTCOMES AND LEFT VENTRICULAR VOLUME-

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Background:

Ischemic mitral regurgitation (IMR) causes poor prognosis. The etiology is annular dilatation and mitral tethering due to dilate left ventricle (LV). The reliable mitral repair (MVP) and the late results are not well known. The surgical techniques and operative results were studied.

Methods:

The IMR was operated in 132 patients. The mean age was 65+/-10 and there were 111 men and 21 women. The degree of MR was assessed by echocardiogram and the LV volume was determined with scintigram and/or LVG. For MVP, the circular ring annuloplasty was applied in all patients and papillary muscle approximation in 12 or second chordal cutting in 9 was added. The LV was restored simultaneously when the LVESVI was larger than 100ml/m2 (SVR-group, n=70). After the operation MR was examined and the LV size was calculated. The late results were compared in SVR group and non-SVR group.

Results:

In SVR group the ESVI reduced less than 100 ml/m2 in 49 (LV volume reduction rate 35%) and remained more than 100 ml/m2 in 21 (the reduction rate 14%). Concomitant CABG was in 109 with a mean of 2.8+/-1.2 per patient, tricuspid surgery in 33. Perioperative IABP was used in 10. The hospital mortality was 3 in 125 elective operations and 2 in 7 emergent operations. In late follow-up, MR more than moderate recurred in 5 in non-SVR group. The 5 or 8 year survival rate was 84.0% or 80% in 62 patients with small LV without SVR, and 58% or 20% in SVR group ($p<0.02$). In SVR group the survival rate was 80% or 72% in the 49 patients with small ESVI, however, 35 % or 0% in 21 patients with LVESVI larger than 100ml/m2 ($p<0.01$).

Conclusions:

The surgical outcome for ischemic MR is related to the post operative LV volume.

O15-8

PREDICTORS FOR HOSPITAL MORTALITY AFTER REDO MITRAL VALVE SURGERY

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[Objective]

We aim to investigate risk factors for hospital mortality in patients who underwent mitral valve surgery with previous mitral valve intervention at our institution.

[Methods]

Sixty-one patients (69±10 years old, 35 females) have undergone redo-mitral valve surgeries between January 2002 and May 2012. Previous operation procedures, preoperative data and risk factors affecting hospital mortality were analyzed.

[Result]

The hospital death of the entire cohort was 9.8% (n = 6). The previous mitral procedures include 22 mitral valve plasty and 39 mitral valve replacements (either bioprosthetic (n= 10) or mechanical valves (n= 13)). Previous mitral operations concomitant with aortic valve surgery were performed for 9 cases. The reasons for reoperation were either native valve degeneration resulting in mitral stenosis or insufficiency after mitral valve plasty (n= 36), para-prosthetic leakage (n= 11), structural valve dysfunction (n= 8), or prosthetic valve endocarditis (PVE) (n= 6). Sixteen patients (26%) had more than two times of re-strnotomies. Heart failure symptoms (NYHA class III or IV) was present in 34 patients (55.7%) at the reoperation. Preoperative renal dysfunction was present in 8 patients (13.1%). Univariate analysis of risk factor for hospital mortality identified renal dysfunction (OR, 9.99; 95% CI, 1.15-69.1; P= 0.018), previous mitral surgery with aortic valve replacement (OR, 8.16; 95% CI, 1.27-54.2; P<0.02), PVE (OR, 6.77; 95% CI, 0.73-45.9; P=0.08), heart failure NYHA class III-VI (OR, 4.48; 95% CI, 0.66-88.8; P= 0.13). By multivariate analysis, previous aortic valve replacement (OR, 36.1; 95% CI, 2.28-22.8; P< 0.01), and PVE (OR, 40.4; 95% CI, 1.01-55.9; P<0.05) were independent predictors for hospital mortality.

[Conclusion]

Patient, who has undergone mitral and aortic operation concomitantly or has surgical indication due to PVE, has high risk profile for redo mitral surgery. Intensive follow up of high risk patients after surgery and careful selection of reoperation timing is needed.

O15-9

LEFT ATRIAL PLICATION FOR GIANT LEFT ATRIUM: LONG-TERM RESULTS AND PLICATION SITE SELECTION

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OBJECTIVE
Evaluate long-term postoperative results of left atrial (LA) plication (LAP) and plication site selection in patients with giant left atrium (GLA).

METHOD
Twenty-three GLA patients, who underwent LAP between 2001 and 2012, were divided into two groups according to plication site: Group A consisted of nine patients with both para-mitral valve annular (para-MV) plication and plication between the right and left pulmonary veins (inter-PV); and Group B which included 14 patients with other plication sites. Left atrium diameter (LAD) changes, cardiac symptoms determined by New York Heart Association (NYHA) scores, respiratory function and brain natriuretic peptide (BNP) levels were evaluated retrospectively and survival curves prepared using the Kaplan-Meier method.

RESULTS
Preoperation, immediate, 1-year, 3-year and 5-year postoperation LAD ranges were 57-106mm (median 75mm), 49-88mm (61mm), 50-95mm (65mm), 47-89mm (63mm) and 49-94mm (62mm), respectively. Postoperative NYHA scores, percentage of vital capacity and forced expiratory volume 1.0% levels improved in most patients. Immediate postoperation results and those recorded shortly after hospital discharge were similar for both groups. There were no hospital deaths although six patients subsequently died following discharge. BNP levels were not significantly different 1-year postoperation, but were significantly lower in Group A more than one year after surgery. Postoperative survival rates for all patients at two years and four years were 94.7% and 86.1%, respectively. Immediate postoperative ratio of postoperative LAD to preoperative LAD significantly decreased in both groups while only Group A experienced a significant decrease 1-year postoperation.

CONCLUSIONS
Cardiac symptoms and respiratory function improved after LAP and plication effects were well maintained in both groups of GLA patients five years postoperation. Greater LA volume reduction effect was achieved in Group A patients who underwent both para-MV and inter-PV plication procedures which did not increase complications and should be routinely performed together.

O16-1

ON-PUMP BEATING OPEN LEFT-HEART SURGERY

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OBJECTIVE: In modern cardiac surgery, as myocardial protection is established by cardioplegia, it is essential to perform procedures during cardiac arrest under cardiopulmonary bypass. On the other hand, on-pump beating left-heart surgery involves drawbacks such as poor surgical field and risk of air embolism. Nevertheless, we encounter a few cases in which cardiac arrest should be avoided and procedure under beating condition is required. We report our experience of on-pump beating open left-heart surgery.

METHODS: From August 2008 to July 2012, we performed 5 left-heart operations under beating condition, which accounted for 0.7%(5/721) of all cardiac surgery. There were 4 males and 1 female; mean age was 69.6 ± 6.1 years old. The reasons why beating condition was necessary were mobile plaque in ascending aorta(case A and B), avoidance of cardioplegia injection for cryoglobulinemia (case C), difficulty in crossclamp through right thoracotomy in patient with 3rd surgery(case D), and impaired left ventricular function (case E). Operation performed was MVR+CABG (A), Dor operation+CABG (B), left ventricular reconstruction and CABG (C), MVR (D) and MVR+AVR+TAP (E); at the time of AVR, beating heart was maintained by injecting oxygenated blood continuously via the coronary sinus after aortic crossclamping.

RESULTS: There were no operative and hospital deaths. Neurological complications were not observed. To improve the surgical field in case A and D, temporary ventricular fibrillation was applied during MVR. Organ injury due to cryoglobulinemia was not complicated in case C. Case E suddenly developed cerebral infarction on 33rd POD and was transferred to another hospital to receive catheter intervention. Other 4 patients discharged without any complications.

CONCLUSIONS: Surgical procedures were accomplished without cardiac arrest in all cases. We believe on-pump beating open left-heart surgery is useful as an alternative for patients in which cardiac arrest should be avoided.

O16-2

OFF PUMP BEATING HEART FOR HIGH RISK CORONARY ARTERY BYPASS GRAFTING- IS IT JUSTIFIED?

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Objective

On pump beating heart(CPB-CA) has been used successfully in High risk patients patients requiring valvular surgery and it's use has been extended to high-risk coronary artery surgery too on grounds that as it avoids cardioplegic arrest it will be beneficial to the high risk patietns. However, data comparing it with off-pump coronary artery bypass (OPCAB) which avoids both cardiopulmonary bypass and cardioplegic arrest are sparse. The aim of this study was to compare OPCAB with CPB-CA in a high risk group presenting for coronary artery bypass grafting.

Methods

We performed a retrospective analysis of prospectively collected data on high risk patients (defined as those with additive Euroscore>5) undergoing CABG. The study cohort included 964 patients during the study period ranging from 2006 to 2010. Patients were placed into two groups depending on whether they had the operation as on pump beating heart surgery(n=337) or OPCAB(n=627) and compared in terms of 30 day mortality and in hospital morbidity.

Results

The two groups were well matched in terms of baseline characteristics like age [64.9 yr ±7.61 vs. 66.4yr ±8.06], Logistic Euroscore [9.08±6.16 vs. 8.06±5.16], Diabetes Mellitus [n=168 (49.85% vs. n=292(46.57%)], and Hypertension [n=236 (70.03%) vs. n=450 (71.8%)]. Mortality in the OPCAB group was significantly better [n=30(4.78%) vs. n= 22(6.5%)]. Neurological outcomes [n=8 (1.27%) vs. n=15 (4.45%)], tracheostomy [n=38 (11.27%) vs. n=13 (2.07%)] renal failure [n=50 (14.92%) vs.40 (6.37%)] were all significantly higher in the on pump beating heart group.

Conclusion

OPCAB outcomes were superior to the on pump beating heart group. Unlike in valvular surgery and in contradiction to some case series our study shows that on pump beating heart does not offer any advantage over OPCAB in this high risk group.

O16-3

OFF-PUMP VERSUS ON-PUMP BEATING AT ISOLATED CORONARY ARTERY BYPASS GRAFTING

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BACKGROUND:

In recent years, we prefer on-pump beating coronary artery bypass grafting (OBCAB) as first choice procedure from the point of accomplishing complete and good quality revascularization, although the off-pump coronary artery bypass grafting (OPCAB) has been performed as standard procedure in many other institutions. Now we perform OPCAB when we only need anterior grafting of the heart, or when the patients have any risk to operate cardiopulmonary bypass, like malignant disease.

OBJECTIVE:

To compare the early operative results between OPCAB and OBCAB.

METHODS:

From January 2007 to December 2011, 107 patients received isolated CABG as elective primary operation. There were 87 male and 20 female, mean age was 68 years old. Patients were divided in OPCAB group (n=60) and OBCAB group (n=47). Two groups were compared retrospectively in (1) Early operative result, and (2) Perioperative risk factors.

RESULTS:

OPCAB vs. OBCAB: (1) Surgical death (0vs.0), postoperative cerebral infarction (0vs.0), number of proceeding grafts (2.8vs.2.8), utilizing L(R)ITA (93.3vs.97.8%), utilizing SVG(96.7vs.93.5%), complete revascularization(93vs.96%). There was one case converted from OPCAB to OBCAB during the operation. (2) Preoperative LVH(8.3%vs.97.8%*), and abnormal Qwave(33.4%vs.69.6%*) on ECG, LMT disease(23.3%vs.43.5%*), three vessel disease(71.7%vs.43.5%*), duration of intubation(7±16vs.13±19hrs*), postoperative atrial fibrillation occurrence (26.1%vs.6.5%*). *p<0.05

CONCLUSIONS:

Present study revealed that OBCAB applying to properly selected patients could be performed as safe as OPCAB with acceptable prolong of postoperative duration of intubation.

O16-4

INDIVIDUALIZED SURGICAL STRATEGY TO PREVENT EMERGENCY CONVERSION IN OFF PUMP CORONARY ARTERY

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Objective: Emergency conversion to cardiopulmonary bypass (CPB) in off-pump coronary artery bypass (OPCAB) increases operative mortality and morbidity. In the present study, an individualized surgical strategy adapted to coronary anatomy and pathophysiological changes of each patient undergoing OPCAB was applied to prevent emergency conversion.

Methods: 238 OPCAB patients were divided into two groups: 117 patients (101 male) with an age 64.1±8.6 years with conventional technique (group A) and 121 patients (98 male) with an age 64.8±10.1 years with the individualized surgical strategy (group B). In group A, anastomosis of left internal mammary artery (LIMA) to left anterior descending (LAD) artery was performed first, which followed by proximal anastomoses and peripheral anastomoses to marginal branches of left circumflex (LCX) and then to branches of right coronary artery (RCA). In group B, proximal anastomoses were always performed first. Peripheral anastomoses to each target vessel were performed in the same sequence as the severity of coronary stenosis. Occluded vessels were taken first in sequence of Diagonals, LAD, and RAC, if any of them involved. Stenosed but un-occluded vessels were taken after the occluded ones in the same sequence above and followed by LCX branches. Tissue stabilizer was used for all anastomoses, and apex stabilizer was used to perform anastomoses to LCX and RCA branches. Intraluminal shunt was always applied to LAD anastomosis regardless of severity of its stenosis. Vessel loop was applied when necessary.

Results: Total distal anastomoses were 3.5±0.9 in group A, and 3.7±0.9 in group B. OPCAB was converted to on pump CABG in 8 patients (6.8%) in group A and in 2 patients (1.7%) in group B ($p<0.05$). There were no significant differences between the two groups in hospital mortality (2.6% vs 1.7%) and other postoperative complications.

Conclusion: The individualized surgical strategy in OPCAB can significantly reduce conversion to CPB.

O16-5

ADVERSE EFFECT OF MANIPULATION OF THE ASCENDING AORTA ON STROKE AFTER OFF-PUMP CABG

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Objectives: We retrospectively examined the adverse effect of manipulation of the ascending aorta on stroke after off-pump CABG.

Methods: Of 1006 consecutive patients underwent isolated CABG between January 2002 and August 2012, we studied 1000 patients who underwent off-pump CABG without conversion to cardiopulmonary bypass during surgery. We excluded the remaining 6 patients who required emergent extracorporeal life support at other hospitals for cardiac arrest caused by AMI. Stroke was defined as a postoperative central neurological deficit confirmed by MR scan that resulted in irreversible body impairment. Vein-to-aorta anastomosis was performed using partial clamping or an anastomotic device after assessing the severity and location of atherosclerosis of the ascending aorta using epiaortic ultrasonography. Propensity score was created to quantify the likelihood that manipulation of the aorta would be performed in a given patient using a multivariate logistic regression based on the following seven variables with a significant level of <0.05 in bivariate analyses: age, female gender, body mass index, smoking, hyperlipidemia, chronic kidney disease, previous myocardial infarction, and preoperative intra-aortic balloon pumping (C statistics, 0.74).

Results: The incidence of stroke was 1.1% of all patients (11/1000), 2.0% of patients who did receive the manipulation of the ascending aorta (8/414), and 0.5% of patients who did not (3/586). The risk factors statistically significant in a multivariate logistic regression model were manipulation of the ascending aorta (odds ratio, 2.22; 95% CI, 1.55-5.55; p=0.001), history of stroke (odds ratio, 3.59; 95% CI, 1.75-7.12; p=0.001), and estimated glomerular filtration rate <60 mL/min/1.73 m2 (odds ratio, 4.76; 95% CI, 2.15-7.31; p=0.001). Propensity score-adjusted odds ratio (95% CI) of manipulation of the ascending aorta for the association with postoperative stroke was 2.73 (1.44-5.82).

Conclusion: Manipulation of the ascending aorta needs to be avoided to further reduce the risk of stroke after off-pump CABG.

O16-6

WITHDRAWN

O17-1

LONG-TERM OUTCOMES FOR PATIENTS WITH DIABETES MELLITUS UNDERGOING CABG

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Objectives: It is reported that CABG is superior to PCI in terms of prognosis and coronary events in patients with DM. Although there are more reports that DM patients had poorer prognosis, outcomes of DM patients are still under controversial. Herein, we evaluated long-term outcomes in DM patients undergoing CABG, compared with non-DM.

Methods: A retrospective analysis was performed on 353 consecutive patients undergoing CABG alone and comparison was made between DM (183) and non-DM (170). Average follow-up was 1864 vs 1907 days. There are no significant differences in age (66, 67 years), CVA (40, 35 cases), HL (80, 73 cases), CKD (20, 16 cases), HD (11, 4 cases), OPCAB (91, 90%), and BITA (59, 57%). Lower EF (55, 60%), more LMD (34, 54 cases), and more multiple vessel targets were recognized in DM group ($p< 0.05$).

Results: 5-year survival was 90% in DM and 88% in non-DM. Postoperative events of CVA, acute renal failure, pneumonia, and mediastinitis weren't significant between DM and non-DM. There were no significant differences in all-cause death, MACCE, death/CVA/MI, repeat revascularization between DM and non-DM. Focusing on DM group, insulin group had higher MACCE ($p=0.003$) and higher death/CVA/MI ($p=0.05$) than non-insulin. 5-year freedom of repeat revascularization was 72% for insulin, 92% for medication, and 89% for diet ($p=0.001$).

Conclusion: Compared with non-DM, DM group had the same risk of postoperative morbidities including mediastinitis, as well as the same long-term outcomes including MACCE. However, patients with DM on insulin had higher MACCE and repeat revascularization than non-insulin group, and are considered to be followed up carefully.

O17-2

PREVENTION FOR PERIOPERATIVE STROKE OF CABG PATIENTS; HOW TO MANAGE THE PATIENTS WITH OCCLUSIVE CEREBROVASCULAR DISEASE

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Objective. This study was designed to determine whether off pump Surgery (OPCAB) could reduce perioperative stroke for the patients with occlusive cerebrovascular disease (CVD).

Methods. We studied 661 patients who underwent isolated coronary artery bypass grafting (CABG) retrospectively. 176 patients in group-I who basically underwent OPCAB from 2007/4 to 2012/10 compared to two conventional CABG groups. The group-II was 238 patients who underwent preoperative magnetic resonance angiography of the head and neck and intraoperative epiaortic scanning (EAS). Cerebral hemodynamics were evaluated by single photon emission computed tomography and acetazolamide tests in patients with significant CVD. Aorta no-touch OPCAB in group-II patients was selected based upon EAS. The group-III was 247 patients who received neither preoperative cerebrovascular screening nor EAS. In group-I, 98.3% patients underwent aorta no-touch OPCAB using either a suture device based on EAS or total arterial revascularization.

Results. The prevalence rates of CVD were 14.8% in group-I and 16.8 % in group-II. And also 5.7 % in group-I and 4.6% in group-II were poor cerebral perfusion reserve (pCPR). Although seven asymptomatic patients in group-II underwent prophylactic cerebrovascular interventions due to pCPR, only one symptomatic patient underwent carotid artery stenting in group-I. One patient with pCPR in group-I converted to the on pump beating CABG before hemodynamic instability. The early stroke rate was 0% in group-I, 0.4% in group-II, and 2.8% in group-III, respectively. A multivariate analysis revealed that the operative strategy (odds ratio, 0.034; 95% confidence interval, 0.001 to 0.764) and the history of stroke (7.24; 1.3 to 42.7) were the predictors of early stroke.

Conclusion. Whenever intraoperative stable hemodynamics during OPCAB and postoperative anticoagulation were achieved, asymptomatic CVD may neither need prophylactic intervention nor be a risk factor for perioperative stroke. Unstable hemodynamics should be avoided even in using cardiopulmonary bypass in the patients with pCPR.

O17-3

HIGH RISK CORONARY ARTERY BYPASS GRAFTING- IS OFF PUMP CORONARY ARTERY BYPASS JUSTIFIED?

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Objective:

In recent years through many observational and randomised studies OPCAB has been shown to be a safe procedure. However, outcome data is sparse for the subset of **high-risk patients** presenting for coronary artery bypass grafting. The aim of this study was to assess the outcome of OPCAB surgery in this particular subset of patients presenting for coronary artery bypass grafts.

Methods:

We performed a retrospective analysis of prospectively collected data on the subset of high risk patients undergoing CABG. In keeping with accepted international norms; High risk patients were defined as those with additive Euroscore>5. The study cohort included 627 consecutive high risk patients undergoing primary OPCAB for multi-vessel coronary artery disease at our institution during the study period ranging from 2006 to 2010. Patients operated as an emergency or those who needed a concomitant procedure were excluded from the study.

Results:

The median age of the patients in this group was 66.4yr ±8.06. The logistic Euroscore was 8.06±5.16. Incidence of Diabetes Mellitus was 292(46.57%), and that of hypertension was 450 (71.8%). Median no of grafts used was 2.67. The 30 day mortality was 4.78 %(30/627). Incidence of post operative stroke was 1.27 %(8/627), prolonged ventilation and tracheotomy was needed in 2.07% (13/627) cases; incidence of renal failure was 6.37% (40/627)

Conclusion:

The observed mortality in the study was well below the expected mortality derived from the logistic euroscore and the morbidity was acceptable. While a randomized study is needed to compare OPCAB with conventional CABG in the high risk group we conclude that OPCAB in the high risk group can be performed with acceptable mortality and morbidity and is justified.

O17-4

OUTCOMES AFTER ISOLATED OFF-PUMP CORONARY ARTERY BYPASS SURGERY (OPCAB) IN OCTOGENARIANS COMPARED WITH NON-OCTOGENARIANS

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Objective Coronary artery bypass grafting can be performed with or without Cardiopulmonary bypass. OPCAB should be considered as an acceptable alternative to conventional bypass in elderly. The aim of this study is to determine the early outcomes in Octogenarian patients who underwent OPCAB compared with those who were less than 80 years old.

Methods This retrospective study includes all patients undergoing isolated OPCAB between July 1, 2006 and June 30, 2012 at Bangkok Heart Hospital. In a 6- year period, isolated OPCAB procedures were performed in 709 patients; of these, 43 (6.1%) were at least 80 years old or greater (group 1.) and 666 (93.9%) were those aged less than 80 years (group 2). Pre- operative characteristics, morbidity, and mortality of these 2 groups were analyzed.

Results Patients in both groups were more likely to be male (67.4% in group 1 and 80.8% in group 2). In group 1 presented more often with hypertension (90.7%), triple-vessel disease (88.4%) and LM stenosis (62.8%). In group 2: triple- vessel disease (81.1%), hypertension (74.5%) and hypercholesterolemia (70.6%). The 3 common complications were renal failure, prolonged ventilation and GI complication in group 1; prolonged ventilation, renal failure and septicemia in group 2. The 30- day mortality was higher in group 1 patients (4.7 % vs 2.0% in group 2)

Conclusions Performance of OPCAB surgery among octogenarians is effective with an acceptable mortality.

O17-5

OFF-PUMP CORONARY ARTERY BYPASS GRAFT SURGERY IN ELDERLY PATIENTS

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(OBJECTIVE) The aging population of those living alone is a major social problem and cardiac surgery patients are no exception. We investigated whether or not living alone affects the postoperative prognosis of elderly patients undergoing OPCAB surgery.

(METHODS) There were 131 cases (59%) of patients aged 75 years old or older among 221 OPCAB cases carried out from April 2009 to August 2012, with the subjects divided into: group A made up of 21 cases(16%) living alone and group F made up of 110 cases(84%) not living alone. The age ranges were 78.6±3.2 years old and 78.8±3.3 years old, respectively (p =0.75). The number of male was 15 cases (71%) and 78 cases (71 %) (p = 0.96), respectively. There were no significant differences in any of the other preoperative characteristics.

(RESULTS) The bypass branches were 3.0±0.9 and 2.8±1.1 (p = 0.57). The operative duration were 284±75 min, 252±70 min, respectively (p = 0.06). There were no significant differences in postoperative complications (mediastinitis, congestive heart failure, stroke and revascularization). There was no hospital death. Regarding remote death, there were 2 cases in group A and 10 cases in group F (3 cases of cardiac failure, 1 case each of arrhythmia/malignant tumor/stroke/renal failure, and 5 unknown cases). The survival rate was: 1 year: 85.6% and 95.2%, 2 years: 85.6% and 90.7% (p =0.67), and carotid lesions, peripheral arterial disease, ejection fraction, left ventricular systolic dimension, number of coronary lesions and preoperative intubation were found to be risk factors for remote death based on a univariate analysis, while left ventricular systolic dimension (p = 0.035) and preoperative intubation (p = 0.003) were found to be independent risk factors upon multivariate analysis.

(CONCLUSIONS) It was therefore suggested that living alone does not affect the prognosis of elderly patients undergoing OPCAB surgery.

O17-6

OFF-PUMP CORONARY ARTERY BYPASS GRAFTING IN PATIENTS WITH A LOW EJECTION FRACTION

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OBJECTIVE

A low left ventricular ejection fraction (EF) of less than 30% is an established risk factor for increased mortality after coronary artery bypass grafting. Several studies suggested, however, that a low EF is not a contraindication to off-pump coronary artery bypass (OPCAB) grafting. We evaluated the feasibility of off-pump OPCAB surgery in patients with an impaired ventricular ejection.

METHODS

A retrospective study was conducted between May 2007 and May 2012 at Saitama International Medical Center. We compared 49 patients (low EF group) with an EF of less than 30% with 584 patients (control group) with an EF of equal or more than 30% who underwent OPCAB surgery. A composite endpoint of major outcomes (including in-hospital mortality, acute renal failure, neurologic complications, and surgical site infections) was evaluated among patients. Additionally, a number of bypass grafts was assessed.

RESULTS

An average EF in the control group was 57.4%, and 21.2% in the low EF group. The total number of bypass grafts in the low EF group and control croup was 3.7 ± 1.0 and 3.3 ± 1.1, respectively (p=NS). The in-hospital mortality rates for the low EF group and the control group were comparable (2.0% and 0.3 % respectively, p=NS), and 2 groups did not differ with respect to acute renal failure (8.1% versus 2.5%, p=NS), cerebral infarction (0% versus 0.1%, p=NS) and surgical site infections (8.1% versus 2.9%, p=NS).

CONCLUSIONS

The present study suggested that OPCAB surgery in patients with a low EF is associated with acceptable risk of in-hospital mortality. Postoperative complications tended to be more frequent among patients in the low EF group, but the difference was not significant.

O18-1

NT-PROBNP PROVIDES ADDITIONAL PROGNOSTIC INFORMATION TO EUROSCORE II IN PATIENTS UNDERGOING CABG

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OBJECTIVE: We recently demonstrated that preoperative NTproBNP predicts severe circulatory failure postoperatively, in-hospital mortality and long term survival in patients undergoing surgery for acute coronary syndrome (ACS). In this study we evaluated if NTproBNP adds prognostic information to the recently launched EuroSCORE II in the preoperative evaluation of patients undergoing isolated CABG for ACS.

METHODS: As a sub-study in a prospective clinical trial we studied patients with ACS undergoing isolated CABG. Patients were split into cohorts considered to be at low risk (EuroSCORE II <2.0;n=144), moderate-high risk (EuroSCORE II 2.0-10.0;n=208) or very high risk (EuroSCORE II >10.0;n=13). Based on ROC analysis of NTproBNP with regard to severe circulatory failure these cohorts were further divided into groups with preoperative NTproBNP below or above 1028 ng/L. Outcome was evaluated according to prespecified criteria. Follow-up time averaged 4.1 ± 0.7 years.

RESULTS: Patients with preoperative NTproBNP >1028 ng/L had significantly more inotropic support intraoperatively both in low risk (36 % vs 10 %, p=0.03) and moderate-high risk EuroSCORE II patients (33 % vs 13 %, p=0.0008). In moderate-high risk EuroSCORE II patients NT-proBNP > 1028 ng/L was associated with a higher incidence of postoperative severe circulatory failure (6.6 % v 0 %;p=0.007), renal failure (15 % v 5.4 %;p=0.03), stroke (6.6 % v 0.7 %;p=0.03) and longer ICU stay (37 ± 35 v 27 ± 38 hours, p=0.002). In-hospital or 30-day mortality did not differ (3.3% v 0%;p=0.08) but crude 1-year mortality was higher (4.9% v 0%;p=0.02). EuroSCORE II did not differ significantly between the groups with low and high NTproBNP preoperatively.

CONCLUSIONS: Preoperative evaluation with NTproBNP provides additional prognostic information to EuroSCORE II in patients with ACS undergoing isolated CABG, particularly in those considered to be at moderate to high risk.

O18-2

LONG-TERM OUTCOMES OF NON-HEART TRANSPLANT SURGICAL APPROACHES FOR ISCHEMIC CARDIOMYOPATHY WITH VENTRICULAR RECONSTRUCTION, INCLUDING SCARRED ENDOCARDIECTOMY FOR ARRHYTHMIA THERAPY, AND MITRAL VALVE SURGERY

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OBJECTIVE: The aim of this study is to assess long-term outcomes of non-heart transplant surgical approaches such as left ventricular reconstruction(LVR) including scarred endocardiectomy and mitral valve surgery for ischemic cardiomyopathy(ICM).

METHODS: Among 94 consecutive patients with ICM(EF<40%, LVESVI>60ml/m^2) since 2002, 80 patients with large scar of > 35% of LV circumference underwent LVR including scarred endocardiectomy against arrhythmia and 24 with > 2+MR underwent mitral valve surgery(MAP: n=20, MVR: n=4).

RESULTS: Eight-year survival including 3 perioperative deaths(3.2%) was 75.8% without death due to arrhythmia. 91 survivors revealed significant improvement in NYHA class(2.9 to 1.3) and LV function in terms of PAP(33.6 to 25.9mmHg) and LVEF(33.2 to 41.7%) (p<0.0001). LV volume significantly reduced from 103.2 to 50.1ml/m^2 in ESVI(43% volume reduction)(p<0.0001). Postoperative LV shape became significantly spherical(eccentricity index(EI)closer to 0), however, MR grade was significantly reduced from 2.0 to 1.5(p<0.0001). Freedom from all deaths including hospitalization for cardiac causes was 75.2% at 8 years. One patient required ICD for spontaneous VT. Multivariate Cox's regression model showed preoperative higher PAP(p=0.0264, HR 1.04) were significant risk factor affecting survival and postoperative higher MR(p=0.0490, HR 2.46) affecting all deaths including hospitalization for cardiac events. 94 patients were divided into three groups, undergoing LVR(n=70), MAP or MVR(n=13), and LVR+MAP(n=11) according to the surgical strategy. Postoperative PAP was significantly reduced in the MAP or MVR group(40.6 to 28.6mmHg) and LVR+MAP group(45.1 to 28.8mmHg) compared with LVR group(29.9 to 25.1mmHg) (p=0.0037), although, there was no significant change among three groups in LV volume reduction nor MR grade.

CONCLUSIONS: Our non-heart transplant surgical strategy with LVR and mitral valve surgery for ICM revealed excellent long-term outcomes without death due to arrhythmia. Risk factor analysis recommended earlier and more aggressive surgical approach particularly towards mitral valve complex to achieve LV volume reduction, MR, and arrhythmia control.

O18-3

LEFT VENTRICULAR RESTORATION FOR ISCHEMIC CARDIOMYOPATHY-EFFECTIVENESS OF LARGE SEPTAL ANTERIOR EXCLUSION (SAVE) PROCEDURE-

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Background:

Non-transplant surgery ischemic cardiomyopathy (ICM) is a challenging treatment for severely dilated ventricle. Left ventricular restoration (LVR) in combination with CABG and mitral plasty was conducted and evaluated.

Methods:

Since 2000, LVR for ICM was performed in167 patients was studied. The mean age was 60+/-10 years and there were 147 men and 20 women. The mean preoperative ejection fraction was 24% and the preoperative NYHA was class 3 in 108 and class 4 in 61. After the cardioplegic arrest under cardiopulmonary bypass, CABG was performed in 144 patients (2.6/patient) and mitral repair with one-undersized ring annuloplasty in 91patients or MVR in 16 were performed. For LVR, Dor's EVCPP with small oval patch (3x4cm) was performed in 61, newly developed septal anterior ventricular exclusion (SAVE) with large longitudinal patch (8x4cm) for large akinesis lesion was in 84, and posterior restoration was in 22.

Results:

Perioperative IABP was used in 46 and LVD was implanted in 2 emergent operations. Hospital mortality was 6 in 146 elective operations (4.1%) and 4 in 21 emergent operation. EF or ESVI improved from 24.5% to 34.5% and 115ml/m2 to 75ml/m2 , respectively. At long term-follow-up there were 19 late deaths due to CHF in 11 and VT in 6, and 116 patients (74%) improved the functional class into NYHA class 1-2 with 5 or 10-year survival rate of 77% or 67%respectively. Both Dor's EVCPP for small akinesis and SAVE for large akinesis showed improvement in late symptom and survival.

Conclusions:

Newly developed SAVE operation with large patch in combined with CABG and mitral repair is useful to improve symptom and late results in patients with ICM and markedly dilated LV.

♥ O18-4

INDO SCORE AS SCORING SYSTEM FOR ISOLATED CORONARY ARTERY BYPASS GRAFTING RISK EVALUATION SYSTEM IN INDONESIA

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OBJECTIVE

To construct a scoring system for the prediction of in-hospital mortality in Indonesia patients undergoing isolated coronary artery bypass grafting (CABG).

METHODS

From 2006 to 2011, a complete clinical information of 2910 consecutive isolated CABG patients was collected from Harapan Kita National Cardiovascular Center coronary artery bypass grafting registry. This database was randomly divided into developmental and validation subsets (9:1). A risk model was developed using logistic regression. Calibration and discrimination characteristics were assessed in the validation dataset. Thresholds were defined for each model to distinguish different risk groups. The risk model was compared with EuroSCORE system in the validation dataset.

RESULTS

The scoring system identified 5 risk factors: age ($P < 0.025$), diabetes ($P < 0.044$), congestive heart failure ($P < 0.003$), use of intra aortic balloon pump ($P < 0.000$), and preoperative history of cardiopulmonary resuscitation ($P < 0.000$). In the developmental dataset, calibration by Hosmer-Lemeshow (HL) test was $P = 0.44$ and discrimination by area under ROC (AUC) was 0.80. In the validation dataset, calibration by Hosmer-Lemeshow (HL) test was $P = 0.826$ and discrimination by area under ROC (AUC) was 0.76. Superiority were found over EuroSCORE (HL $P = 0.60$; AUC 0.73).

CONCLUSION

Indo score is a simple, objective and accurate risk stratification system for Indonesia patients undergoing isolated CABG.

♥ : Travel Grant

O18-5

LATE OUTCOMES OF LONG LEFT CORONARY ARTERY ENDARTERECTOMY IN INOPERABLE PATIENTS WITH DIFFUSE CORONARY ARTERY DISEASE

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Background: Diffuse atherosclerosis of the left coronary system is a challenging problem that may requires unconventional surgical treatment to improve the distal run off. Long Left coronary artery branches- endarterectomy (LLCE) as an adjuvant to coronary artery bypass grafting (CABG), has been associated with increased morbidity and mortality with debated long term results. We have studied the early and late outcomes after LLCE-CABG compared to CABG, in the era of antiplatelet therapy.

Methods: We performed retrospective analysis of data collected prospectively on 87 patients undergoing LLCE, between February 1999 and September 2007 by a single surgeon, using a long open endarterectomy (2.5-4cm) dissection and venous patch. We compared outcomes with 75 propensity matched CABG patient by same surgeon, using Cox's regression analysis.

Results: 66% (n58/87) of LLCE group had diffuse atheroma in Left anterior descending artery (LAD), 31% (n= 27/87) involved both LAD and branches of the circumflex artery (Cx). 3% (n=3/87) involved Cx. Cross clamp time (43.29 vs 59.04, p=0.019) and bypass time (57.29 vs 74.04, p=0.007) were significantly higher in the LLCE group. There were no significant difference in early (1% vs 1.3%) and late mortality (4% vs 4.5% at 10 years). The hospital length of stay (5.58 vs 6.67 p=0.03), was higher in the LACE group compared to the CABG group.

Conclusion: This significant long-term survival demonstrates that LLCE can be an attractive adjunct to CABG in otherwise inoperable diffuse coronary disease. The use of retrograde cardioplegia and anti-platelets may have contributed to this excellent outcome; further research is required to confirm these findings.

O18-6

EARLY RESULTS OF OPERATED POST MYOCARDIAL INFARCTION MECHANICAL COMPLICATIONS

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Background : Post myocardial infarction mechanocal complications are lethal. We review our results of the operations for this patient group.

Method and patients: study of patients with the diagnosis of post myocardial infarction mechanical complications operated at Cho Ray hospital from Jan 2011 to July 2012.

Results: number of patients: 12, average age 65,6. The interval between the onset of infarction and the time of complication diagnosed is 9.1 days. The period from admision to operation is 3.4 days. Anterior ventricular septal defect (VSD) 8 patients, posterior VSD 1 patient, left ventricular free wall rupture 2 patients, doudle rupture (posterior VSD and free wall rupture of the left ventricle) 1 patients. Mortality 1/12

Conclusion: operation reduces mortality.

O19-1

MINIMALLY INVASIVE CARDIAC SURGERY WITH THE AID OF 3D-CT IMAGE PROJECTION ON THE BODY SURFACE

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Port-access minimally invasive cardiac surgery (MICS) is complicated by limited skin incision and surgical field. In order to optimize the set-up and port placement in this surgery, we have employed image overlay technique prior to operation consisted of 3D-CT image projection on the patient surface. With the aid of this technique, we successfully performed port-access MICS in 12 patients and mitral valve replacement in 1 patient with severe mediastinal displacement after previous pneumonectomy. Image overlay projection could allow surgeons to view underlying anatomical structures virtually and obtain a good operative field. Our proposed technique would be expected to make port-access MICS easier and probably safer in this particular circumstance.

O19-2

RASAD: A NEWLY DEVELOPED ICT SOLUTION WITH REAL TIME TRANSMISSION CAPABILITY OF ECG SIGNALS

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Objective:

Telemedicine is becoming more popular and has the potential to be more economical than conventional monitoring methods. It also has a role to play in the early diagnosis and monitoring of treatment of cardiac arrhythmias.

Methodology:

We used RASAD, an ICT solution developed at Qatar Science & Technology Park, to evaluate 53 subjects who were fitted with two biological sensors (AliveTech) that recorded a single lead ECG and accelerometer. Real-time and continuous data transmission was performed wirelessly over Bluetooth, WIFI and 3G networks.

Results:

Data transmission lasted for a period of 5 hours. Both the ECG (Holter Monitor) and accelerometer data recorded at the sensor level were 100% matched with the data transmitted over the platform and received at the data centre. There was no appreciable delay in receiving the data, but 17% of the recordings experienced some form of limited transmission due to: early expiration of transmission session, inaccurate recording and failed transmission. This was mainly due to a loss of contact of the skin patches. The clarity and reliability of the ECG were assessed independently and proved to be reliable for both the recorded (Holter Monitor) and transmitted data. The two sets of data matched accurately.

A pilot study and a randomized trial are underway to assess whether RASAD is an effective tool in the diagnosis of cardiac arrhythmias and monitoring of any treatment. Initial data will be presented on its efficacy of use.

Conclusions:

Early diagnosis of ECG abnormalities may lead to more effective medical management and subsequent improved quality of life of the patients as prove to be more cost effective, minimizing hospital admission and associated morbidity and mortality.

O19-3

MAJOR THORACIC VESSELS AND CARDIAC TRAUMA: CASE SERIES FROM A CENTRE IN A DEVELOPING COUNTRY

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Introduction: 75% of all trauma-related deaths are related to Thoracic Trauma. Very few penetrating cardiac trauma patients arrive at the hospital alive. Due to the high prevalence an understanding of the pathogenesis, manifestations, and management of cardiac trauma is becoming increasingly important to medical personnel.

Patients and Methods: We retrospectively reviewed the files of 169 patients with a preoperative diagnosis of vascular injury that underwent management at the Aga Khan University Hospital (AKUH) during 2001 to 2006. Out of these patients 13 had cardiovascular and cardiac injuries.

Results: There were 23% (n=3) Cardiac injuries, two right ventricle injuries and in one both the ventricles were injured. Great vessel injuries included; Pulmonary artery (n=2), Inferior Vena cava (n=1), Left Carotid Artery (n=1), Left Subclavian Artery (n=2) and Right Subclavian Artery (n=3). 53.8% of the patients suffered from post-operative complications. The overall mortality of patients with major thoracic vessel and cardiac trauma was found to be 15.4%.

Discussion: We believe that in comparison to the past the inevitable delay in the diagnosis lead to unsuccessful thoracotomies, late transfers to the operating room and physiological deterioration of the patients. As the incidence of trauma is increasing worldwide it is essential for surgeons to be prepared to handle cardiovascular and cardiac trauma injuries immediately, as delay can adversely affect the outcome in terms of both morbidity and mortality.

Conclusion: All patients presenting with trauma to chest should be assessed with high index of suspicion for major cardiovascular injuries. Early diagnoses, prompt transfer to the operating room and speedy and perfect surgery influences the favorable outcome.

O19-4

HEART RATE VARIABILITY IN RAYNAUD'S PHENOMENON

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OBJECTIVE: Autonomic dysfunction has been described in Raynaud's phenomenon (RP). Heart rate variability (HRV) is one of the reliable parameters to demonstrate autonomic dysfunction. Our aim was to evaluate the HRV in patients with primary Raynaud Phemenon.

METHODS: A short time analysis of heart rate variability was performed in 37 patients with RP, all men, ages between 20-26 years (median 22.4 years) and 34 age-sex matched healthy controls. 24-hour Holter Recording and the analyses of HRV changes (SDNN, SDANN, SDNN index, RMSSD, pNN50 and NN50 Count) were performed in both groups. The results of the study and control group were compared.

RESULTS: We found a statistically significant difference between the patients with RP and control subjects in terms of HRV parameters.

CONCLUSION: Our study showed the presence of sympathetic dysregulation and impairment of parasympathetic modulation of heart function in primary Raynaud's patients. These observations might support the theory of a central impairment of autonomic function in primary Raynaud's phenomenon.

Key words: heart rate variability, autonomic nervous system, Raynaud phemonenon

O19-5

OPTIMIZATION OF CARDIAC RESYNCHRONIZATION THERAPY (CRT) BY MULTI-SCALE HEART SIMULATOR: EXPERIMENTAL VALIDATION USING THE CANINE MODEL OF COMPLETE LEFT BUNDLE BRANCH BLOCK

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Objective:
To identify the responders of CRT and optimize its procedure for maximal effect, we have developed a patient-specific simulation of CRT. In this study, we evaluated its predictive ability in canine model of complete left bundle branch block (CLBBB) and examined the feasibility of clinical application.

Methods:
Male beagle (weight: 10kg) was used in the experiment. The experimental protocol was approved by the institutional committee. One month after CLBBB induction by catheter ablation, baseline ECG, CT scan, and echocardiography were obtained. 3D models of heart and torso were created and simulations of biventricular pacing (virtual CRT) were performed with one RV lead and one LV lead placed at 4 different epicardial sites (1: lateral base; 3: apex; 2: mid-point between sites 1 and 3; 4: anterior base) in the free wall. CRT experiments were performed by following the same pacing protocols as used in the simulations. LV functions including the synchronization of wall motion were compared between the experimental CRT and the virtual CRT by recording hemodynamic parameters and echocardiographic indices of synchronization.

Results:
Simulation: Biventricular pacing with leads placed at RV and LV site 1 (lateral base) resulted in the highest values of stroke volume (17.63ml), EF (57.38%), and peak LV pressure (106.7mmHg). LV site 4 provided the worst performance. Experiment: Highest values of LV systolic pressure (127.8mmHg), aortic valve velocity time integral (14.22cm) and the shortest time to peak radial strain (12ms) were obtained at the LV site 1. This pacing site also gave the best indices of synchronization. Furthermore, as in the simulations, the worst performance was observed at LV site 4.

Conclusion:
CRT simulation using the 3D multi-scale heart simulator successfully predicted the therapeutic effect of CRT in dog model of CLBBB; thus it can be a useful tool for the patient-specific optimization of CRT.

O20-1

USE OF A NEW DEVICE FOR DISTAL CORONARY ANASTOMOSIS -RABBIT CAROTID ARTERY MODEL-

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OBJECTIVE: Different devices have been developed for distal coronary anastomosis for less invasive and conventional off pump coronary artery bypass surgery. But none of these devices have been universally adopted. In this study, we describe the safety and efficacy of a new anastomosis device that we developed using rabbit carotid artery model.

METHODS: The device we developed consists of an anchor made of biocompatible stainless steel, which is combined with the free end of the ordinary 8-0 mono-propylene suture. This device enables us to skip manual ligation with easy swaging motion after conventional suturing. Twenty two rabbits were used in this study. Right carotid artery was bypassed (two-point-end-to-side anastomotic technique) using autologous jugular vein graft. Ten rabbits were operated using the device (group D), and the remaining with conventional 8-0 mono-propylene suture (group C). Suture time, pre- and post-operative blood flows were evaluated during surgery. Postoperative evaluation at 1 month (8 rabbits), 3 months (10 rabbits), and 6 month (4 rabbits) was done by angiography and measuring blood flow, and anastomotic site were resected for histopathogical examination after rabbits were sacrificed.

RESULTS: Suture time was 15.7±2.3min in group D and 16.7±4.6 min in group C (p=0.396). Grafts patency by angiography after 1month, 3months, 6months was 75.0%, 83.3%, 100% in group D and 75%, 75%, 100% in group C respectively. Average blood flow at pre-, post-operative and each of these periods revealed no significant difference between two groups. Histopathologic examination revealed ordinary inflammatory responses at the anastomotic sites in both groups, but tissue-invasiveness and specific inflammatory changes derived from new devices were not observed.

CONCLUSIONS: Our device revealed non-inferiority in efficacy and safety compared with conventional technique in this chronic animal study, and this device might have a potential use in both less invasive endoscopic and open surgeries.

O20-2

ANOTHER OPTION OF SVC CANNULATION FOR MINIMALLY INVASIVE CARDIAC SURGERY(MICS) : TRANS-THORACIC SVC CANNULATION

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Background.

SVC cannulation for minimally invasive cardiac surgery is commonly performed percutaneously with the Seldinger technique. We used transthoracic SVC(TSVC) cannulation for minimally invasive cardiac surgery. The aim of this study is to evaluate the efficacy and safety of TSVC cannulation compared with percutaneously SVC cannulation.

Materials and Methods.

From February 2009 to August 2012, 44 patients underwent ASD closure with or without tricuspid repair. Of them, 35 patients underwent surgery with TSVC cannulation(TSVC group) whereas 9 patients underwent surgery with percutaneously with the Seldinger technique.(PERC group). TSVC cannulation was directly performed via right atriotomy site. Operative data and clinical outcomes of two groups were compared.

Results.

Cardiopulmonary bypass time was shorter in the TSVC group than in the PERC group(59.23±16.78 vs 74.89±22.02, $p<0.05$). Aortic cross cramp time was no differences between two groups. ICU stay and postoperative bleeding(12h) were also no differences between two groups. Mechanical ventilation time was shorter in TSVC group and extubation in operation room were more frequent in the TSVC group (Table 1). There was no wound at neck in the TSVC group, but there was 1cm sized wound at neck in the PERC group.

Conclusions.

TSVC cannulation lead to eatlier extubation, less postoperative pain, better cosmetic effects than percutaneously SVC cannulation without increasing operation time. TSVC cannulation can be good alternative for percutaneous SVC cannulation in minimally invasive cardiac surgery.

O20-3

THE FIRST EXPERIENCE WITH PERCEVAL-S SUTURELESS AORTIC PROSTHESIS IN SINGAPORE

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OBJECTIVES

The Perceval-S aortic prosthesis (Sorin Group, Saluggia,Italy) is a sutureless, aortic valve prosthesis with potential to cover less invasive and other applications. In the present study, we report the first experience with Perceval-S in Asian patients in Singapore.

METHODS

Our first experience in Singapore consists of 3 subsequent Perceval-S valve implantations, of which the first was performed via full sternotomy, the second via ministernotomy while the third case was redo aortic valve replacement (AVR). Two patients received size L (for annulus of 23-25mm) and one patient received size M (for annulus of 21-23mm) Perceval-S prostheses. The Perceval-S sutureless valve involves collapsible Nitinol frame in which a bovine pericardium prosthesis is suspended. The valve is not being crimped, but rather collapsed, and each implantable along three temporary guiding sutures into the aortic annulus. Patient selection was in compliance with modified guidelines recommended by the company, following more than 500 implantations in the western hemisphere. Two patients did not qualify due to bicuspid valve and annular ectasia/non-coronary sinus aneurysm.

RESULTS

All Perceval-S implantation surgeries were uneventful, with zero to trivial residual central regurgitant jet. In spite of learning curve, the bypass time was 82.3 ± 7.1 mins and the cross-clamp time was 60.7 ± 10.3 mins. Deployment was a comprehensive and easy process. Patients had uneventful post-operative recovery, of which the patient with ministernotomy benefited the most. She was discharged 5 days after surgery. One month follow-up revealed excellent prosthesis function (with peak and mean pressure gradient of 24.2±9.9mmHg and 14.2±4.7 mmHg, respectively) and good left ventricular ejection fraction (61±7%).

CONCLUSIONS

Sutureless aortic prosthesis may find a strong need in Asia, particularly for less invasive procedures, combined and redo operations. The Perceval-S valve is a very easy to handle and reliable product with good apposition in the aortic root.

O20-4

EARLY RESULTS OF MINIMALLY INVASIVE CONCOMITANT MITRAL VALVE SURGERY AND RADIOFREQUENCY-CRYO ABLATION MAZE

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Objectives. To determine possibility of freedom from atrial fibrillation (AF) in patients who undergoing minimally invasive mitral-maze surgery.

Methods. From November 2009 to November 2012, 24 consecutive patients of mini-mitral-maze surgery were prospectively reviewed. All patients underwent right mini thoracotomy. Modified Cox maze IV was performed using radiofrequency (RFA)-cryo ablation. Overall probability of time-related postoperative SR occurrence was estimated. Factors associated with failure of the ablation and recurrent AF was determined.

Results. All patients were in chronic longstanding AF. Mean age was 55.8±9.4 year. The majority of patients had mitral valve repair (83%). 16.6% had combined tricuspid valve surgery. Mean left atrial diameter was 56±6.7mm. Patients were followed up to November 2012. Freedom from AF was 94% at one year and 80% at two year.

Conclusions. Minimally invasive approach can be applied to a group of concomitant mitral maze surgery patients with satisfactory early results.

O20-5

IS COMPLETE RESECTION PIVOTAL IN SURGICAL THERAPY FOR ADVANCED PRIMARY CARDIAC TUMOR? EFFECTIVENESS OF INCOMPLETE BUT LIFE-SAVING TUMOR RESECTION WITH ADJUVANT THERAPY

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Objective: Advanced malignant tumors arising from the heart are rare but sometimes life-threatening due to hemodynamic deterioration cause by intracardiac tumor mass, in such cases complete resection may be a challenging goal but a tragic outcome. We report short-term outcomes in 3 patients who underwent incomplete but life-saving tumor resection with adjuvant therapy.

Methods: Patient's data were retrospectively reviewed in terms of histological types, hemodynamic states, presence or absence of metastasis, surgical procedures, adjuvant treatment and postoperative prognoses.

Results: Patient 1: A 39-year old man with a right ventricule (RV) sarcoma occupying the pulmonary trunk and bilateral main pulmonary arteries underwent partial tumor resection in the RV outflow tract with bioprosthetic pulmonary valve implantation, followed by radiotherapy. The RV pressure estimated by echocardiography significantly decreased (>100 mmHg before surgery to around 50 mmHg after radiotherapy). Thereafter he survived for 6 months before death from brain metastasis. Patient 2: A 64-year old woman with a right atrium malignant lymphoma invading the left atrium underwent partial tumor resection followed by chemotherapy, resulting in improvement of her symptom (shortness of breath). Patient 3: A 77-year old woman with a pulmonary artery intimal sarcoma invading the RV underwent tumor resection, resulting in improvement of severe dyspnea and reduction of the estimated RV pressure (70 mmHg to 35 mmHg). One month later, due to hemodynamic deterioration caused by recurrent tumor, she underwent additional tumor resection with concomitant cryoablation, which resulted in successful outcome.

Conclusions: In patients with advanced primary cardiac malignancy, tumor resection as a life-saving operation may be recommendable even if the resection is incomplete, which should be accompanied by adjuvant therapy (radiotherapy, chemotherapy) and/or intraoperative cryoablation. If the tumor is not responsive to adjuvant therapy, complete tumor resection without delay is necessary.

O20-6

PRIMARY MALIGNANT MESOTHELIOMA OF THE PERICARDIUM

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BACKGROUND:
Malignant mesotheliomas are rare tumors that can arise in any of the body cavities covered by mesothelium. Primary mesothelioma of the pericardium is a very rare tumor that accounts for 0.7% of all malignant mesotheliomas. We report the case of primary pericardial mesothelioma incidentally found during the operation of aortic valve replacement.

METHODS:
A 77-year-old male with a history of massive pericardial effusion (PE) of unknown etiology was referred to our institution because of worsening dyspnea and shortness of breath in June 2011. Pericardiocentesis was performed, the fluid was bloody exudates but all analysis showed negative for infections or malignancies. Transthoracic echocardiography demonstrated severe aortic stenosis with the maximal pressure gradient of 114mmHg and aortic valve area of 0.42cm2. Left ventricular motion was preserved with ejection fraction of 57%, however pericardial effusion of 5cm in diameter was still identified in August. Surgical treatment was planned for relieving his symptoms of severe AS and to confirm the definitive diagnosis of unknown PE.

RESULTS:
At operation, massive hemorrhagic PE was found and the visceral pericardium irregularly thickened after median thoracotomy. The mobility of the heart was restricted due to remarkable adhesion with pericardium, therefore establishing cardiopulmonary bypass was considered to be unable. During operation, aspirated PE and the resected pericardium came out being positive for malignancy in pathological study. The only procedure of partial pericardiectomy and drainage of left pleural effusion was performed. Histological examination of the pericardium confirmed the malignant mesothelioma. The patient died after 6 months of postoperative follow up.

CONCLUSIONS:
Primary pericardial malignant mesotheliom carries an extremely poor prognosis due to its late presentation and low chance of complete surgical resection. Early diagnosis is crucial for the optimal treatment of the disease, however, it can be challenging as presented in our case.

O21-1

OUTCOME OF PERICARDIECTOMY FOR CONSTRICTIVE PERICARDITIS IN JAPAN

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Objective: We evaluated the current results and the predictors of in-hospital complications for pericardiectomy procedure for constrictive pericarditis in Japan.

Methods: 346 patients who underwent isolated pericardiectomy for constrictive pericarditis throughout the country between 2008 and 2012 were identified from the Japan Adult Cardiovascular Surgery Database (JACVSD). The short-term surgical outcome after pericardiectomy was investigated. Risk-adjusted logistic regression model was used to analyze the predictors of surgical outcomes.

Results: The patients' mean age was 65.7+/-11.7. Cardiopulmonary bypass(CPB) was used in 28.9% of cases. 90.0% of the patients were operated via median sternotomy approach and 10% were operated via left thoracotomy approach. Outcomes were 30 days mortality of 5.0%, operative mortality (in-hospital or 30-day mortality whichever was longer) of 10.0%, composite operative mortality or major morbidity (defined as stroke, reoperation for bleeding, need for mechanical ventilation for more than 24 hours postoperatively due to respiratory failure, renal failure with newly required dialysis, or deep sternal wound infection) of 15.0%. Logistic regression analysis revealed that the predictive factors for composite operative mortality or major morbidity were preoperative chronic lung disease (odds ratio (OR)=4.75, p<0.001), NYHA functional class IV (OR=3.85, p<0.001), previous cardiac surgery(OR=2.68, p=0.006), preoperative renal failure(OR=2.62, p=0.014), and use of CPB during the operation(OR=2.46, p=0.015). The use of CPB in the patients of left thoracotomy approach (2.9%) is less than that in the patients of median sternotomy approach (31.8%) (p<0.0001).

Conclusions: Pericardiectomy for constrictive pericarditis remains a procedure of high morbidity and mortality. Chronic lung disease and advanced NYHA functional class especially have a significant negative impact on surgical outcomes. To avoid CPB, the left thoracotomy approach can be an option, but negative effect on respiratory function should be also considered.

O21-2

CARDIAC PAPILLARY FIBROELASTOMA: COMPARATIVE STUDY BETWEEN ECHOCARDIOGRAPHIC AND OPERATIVE FINDINGS

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Objective: Cardiac papillary fibroelastoma (PFE) is rare cardiac benign tumor. But it often causes embolic events. We experienced 25 cases of PFE. We examined the clinical features of them.

Methods: We identified 25 cases of PFE between July 2003 and November 2012. We retrospectively examined the clinical features of PFE using clinical charts and operative findings.

Results: There were 46 PFEs in 25 cases. One patient suffered from cerebral infarction preoperatively. In echocardiography, the most affected lesion of the tumor is aortic valve (41 tumors), followed left ventricle in 2, mitral valve in 1, tricuspid valve in 1 and left atrium in 1. Tumor size ranged from 1 to 20 mm, and 8 cases had multiple lesions (2-6 lesions). Sixteen tumors were diagnosed preoperatively, but thirty were diagnosed intraoperatively. Among PFEs of 1mm in size, only 5 tumors were detected but 24 were not detected preoperatively. Whereas, among PFEs of more than 1mm in size, 10 tumors were detected but 3 PFEs were not detected preoperatively. Small PFEs were tend to be significantly overlooked preoperatively ($p<0.001$). In addition, 29 PFEs (71%) in aortic valve were less than 1mm and no PFE was less than 1mm in other locations. Small PFEs were significantly tend to be generated from aortic valve ($p=0.01$). There was no case of recurrence.

Conclusions: PFEs are generally small and may cause embolism. We must be careful not to overlook PFEs because they are not often diagnosed preoperatively, especially in aortic valve.

O21-3

POSTOPERATIVE LIVER DYSFUNCTION AFTER OPEN HEART SURGERY
~ RELEVANCE OF HEART FAILURE AND POSTOPERATIVE OUTCOME ~

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OBJECTIVE: Despite recent advances in surgical techniques and perioperative management, liver dysfunction after open heart surgery remains common and its mechanism is unclear. We evaluated the incidence and nature of postoperative liver dysfunction in cardiac surgery patients, to analyze the risk factors and identify the clinical significance of this complication.

METHODS: A total of 991 consecutive patients (663 males, age, 62.7±16.1 years) who underwent open heart surgery between 2007 and 2011 were investigated. Postoperative liver dysfunction was defined as a serum total bilirubin concentration of >5 mg/dl in any measurement during the postoperative period.

RESULTS: Postoperative liver dysfunction developed in 115 patients (11.6%), and was associated with greater in-hospital mortality (26.1% vs. 1.6%, p<0.01), postoperative renal failure (25.2% vs. 4.0%, p<0.01), and respiratory complications (40.0% vs. 7.8%, p<0.01). Most total bilirubin increases occurred around postoperative day 7 owing to an increase in conjugated bilirubin. Univariate analyses revealed that preoperative NYHA status, degree of tricuspid regurgitation, preoperative liver dysfunction, longer cardiopulmonary bypass time, and transfusion were significantly related to postoperative liver dysfunction. On multivariate analyses, preoperative NYHA status (odds ratio=2.678: I/II vs. III/IV, p<0.01), preoperative liver dysfunction (odds ratio=10.474, p<0.01), preoperative renal dysfunction (odds ratio=1.910, p<0.05), and longer cardiopulmonary bypass time (odds ratio=1.005, p<0.05) were independent predictors.

CONCLUSIONS: Postoperative liver dysfunction is still common in the current era, and is significantly related to preoperative heart failure. In patients with heart failure or liver dysfunction, meticulous operative management including reduction of cardiopulmonary bypass time and transfusion is required to avoid postoperative liver dysfunction.

O21-4

CORONARY ARTERY ANEURYSMS TREATED BY SURGICAL REPAIR

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OBJECTIVE: Coronary artery aneurysms (CAAs) are uncommon anomalies with considerable variability. There are still no standardized guidelines for their therapeutic management due to the lack of experience in a large series. In this report, we studied the clinical characteristics of 9 patients who were diagnosed with CAAs in an attempt to find clues for establishing their optimal surgical strategies.

METHODS: A total of 451 patients underwent coronary bypass surgery at Tachikawa Medical Center during a 5year period (January 2007 to December 2011). We studied the clinical and morphological characteristics, co-morbidities, and outcomes of 9 patients who were diagnosed with 10 aneurysms that required surgery.

RESULTS: Of the 9 patients, 5 presented with cardiac symptoms; 4 chest pains of which were suspected to be related to myocardial ischemia and 1 syncope suspected to be related to coexisting aortic valve stenosis. CAAs were incidentally found in the other 4 patients who were under examination for heart murmur, abnormal electrocardiogram, and abdominal or iliac aneurysms. The sizes of the CAAs determined by measurement on contrast-enhanced coronary computed tomographic angiography (CCTA) ranged from 6.8 to 42.4mm (mean 16.9 ± 6.2mm). Three patients presented with calcification of the aneurysmal walls accompanied by stenosis, while 4 patients had neither stenosis nor calcification. Seven patients had coronary artery bypass grafting. The remaining 2 patients had associating coronary artery fistulas, and required closures of the fistula and aneurysmectomy, but did not require hemodynamic reconstruction. All patients recovered well from the surgical procedures, and had uneventful postoperative courses.

CONCLUSION: CAAs may appear in a variety of anatomy in combination with other coronary anomalies or stenosis. Surgical strategies should be made based on the location and size of the aneurysm, coexisting stenosis and co-morbidities. A detailed analysis by CCTA is an effective method for determining their precise morphology.

O21-5

MICROANGIOGRAPHY FOR CORONARY ARTERY BY THE USE OF NEW DEVELOPED X-RAY SYSTEM WITH A ROTATING CERIUM ANODE

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Objective:

Recently the coronary artery bypass grafting (CABG) technique is improving. However it is unknown how the original small vessels provide the blood to the deep layer of myocardium and whether they change in the myocardial infarcted heart. The diameter of smallest vessels which are visualized by the conventional radiography of coronary artery is about 180μm. We need a new device to evaluate smaller vessels to know the best position for grafting.

Methods:

We developed a new X-ray system to visualize microvessels. We used cerium as an anode because its characteristic X-ray energy (34.4 Kilo Electron Volt; KeV) is nearby the K-edge of iodine (33.2KeV) allowing efficient detection of small amount of iodine-containing contrast materials in the microvessels. In anesthetized dogs (n=5), the concentrated barium was infused into left anterior descending artery (LAD) to full-fill the coronary artery systems with contrast materials. Then the heart was taken from the body. In another dogs (n=5), LAD was ligated just behind the first diagonal branch to make acute myocardial infarction (MI) model. Then the coronary artery was filled with barium and the heart was taken in the same way with non-MI models. The excised heart was radiated directly and behind the 20cm of acrylic plate simulating X-ray absorption of human body.

Results:

The coronary microangiography visualized transmural coronary arteries which are third or fourth branches from LAD penetrating the myocardial wall. The minimum diameter of detected vessels is about 50μm. In the MI model, the flow for the deep myocardium around the infarcted area is decreased, however the microvessels in the deep myocardium still have tiny communications.

Conclusions:

The microangiography using cerium anode X-ray system is useful for evaluating the smaller coronary arteries to evaluate the therapeutic effects of CABG. Furthermore, it may be useful for elucidating pathologies for small coronary disease.

O21-6

THIRTY YEARS OF THE SURGICAL USE OF A CELL-FREE BIOLOGICAL AND PLASTIC MATERIAL TO TREAT CONGENITAL HEART, ACQUIRED HEART AND GREAT VESSEL DISEASES

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Objective: development, experimental and clinical study of a novel cell-free biological and plastic material, based on xenopericardium (XP) for surgery of congenital heart, acquired and vessel diseases.

Methods of study: histomorphology, relaxational spectrometry, experimental model, clinical methods, X-ray diagnostics.

Results. In 1981, a novel material, generated by enzymatic and chemical processing of xenopericardium (XP), was developed and experimentally tested; in 1983 it was introduced into clinical practice. The morphogenesis of XP was studied in dogs at 1, 3 and 6 months following implantation into the anterior cusp of the tricuspid valve. This revealed that XP is immunologically inert and can be degraded. XP has been used to repair the cardiac septum, exterior heart walls, great vessels and heart valve leaflets.

A new mono-leaflet xenopericardial transplant (MXT) was developed using XP. MXT and transannular plastics were implanted into the trunk of the pulmonary artery in 155 patients suffering from Tetrad Fallo. Six (3.9%) of these patients suffered from long-term side-effects caused by suppurative and septic complications, including false aneurysms of the outlet sections of the right ventricular artery (2) and descending aorta (1), recanalization of an atrial septal defect (2), and MXT dysfunction (1). Patch calcinosis or spontaneous collagen degeneration were not detected in any patients. The morphology and structure of the XP was examined in patients who underwent further surgery, which was performed 1-8 years after the initial operation. XP did not cause a lymphoid or plasmatic reaction, maintained the structure of the implant.

Conclusions. The observations that the implanted patches were endothelialized and did not cause degeneration of connective tissue or calcinosis indicate that MXT is the optimal xenogenic plastic material with broad clinical applications in cardiovascular surgery.

O22-1

THORACOSCOPIC ESOPHAGECTOMY WITH EXTENDED LYMPH NODE DISSECTION IN THE LEFT LATERAL POSITION: TECHNICAL FEASIBILITY AND ONCOLOGIC OUTCOMES

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Introduction

Video-assisted thoracoscopic surgery (VATS) is the minimally invasive procedure for esophageal cancer. We demonstrate the procedure of VATS with extended lymph node dissection and the results of our experience.

Methods

Patient is situated in the left lateral position. Esophageal mobilization and mediastinal dissection was performed thracoscopically. Lymph node dissection was done to expose the bilateral recurrent laryngeal nerves (RLNs), membranous portion of trachea and bilateral main bronchus, aorta, left parietal pleura and pericardium.

Results

From January 2003 to December 2011, we performed VATS in 132 esophageal cancer patients. Among them, we experienced conversion to thoracotomy in 6 patients. The average operation time, total blood loss, duration of the thoracic procedure, and the amount of thoracic blood loss was 623±123 min, 657±719 g, 294±88 min, and 313±577g, respectively. We experienced 27 (20.5%) pneumonia, 33 (25.0%) unilateral RLN palsy, 21 (15.9%) bilateral RLN palsy, 13 (9.8%) anastomotic leakage, and 9 (6.8%) chylothorax. Initial recurrence site was as follows: local, 5 (3.8%); lymph node, 20 (15.1%); hematological, 15 (11.3%); pleural or peritoneal dissemination, 7 (5.3%). The prognosis of patients with lymph node metastasis was significantly poorer than that of patients without lymph node metastasis (5-year survival rate: 49.2% vs. 79.8%, P=0.001). However, the prognosis of the 11 cases who had metastasis only around RLNs was similar to that of node-negative cases (5-year survival rate: 77.9% vs. 79.8%, P=0.88). Thirteen patients with pathological remnant tumor did not survive longer than 5 years. The overall 5-year survival rate of stage I, II, and III disease after curative VATS was 82.2%, 77.0%, and 58.6%, respectively.

Conclusions

Although, VATS procedure with extended lymph node dissection is accompanied by a certain degree of morbidity including RLN palsy and pulmonary complications, VATS has an excellent loco-regional control effect with the favorable oncologic outcome.

O22-2

PRONE THORACOSCOPIC ESOPHAGECTOMY AND IMPROVEMENT OF POSTOPERATIVE PULMONARY OXYGENATION

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OBJECTIVE: Esophagectomy has been performed by different procedures of minimally invasive surgery. Thoracoscopic esophagectomy in the prone position provides better surgical view without any lung retraction and better surgical ergonomics. On the other hands, the physiological effect of the prone thoracoscopic esophagectomy is not clear. The aim of this study was to evaluate the postoperative benefits of thoracoscopic esophagectomy in the prone position compared to those of lateral decubitus position.

METHODS: Esophagectomy in the prone position was perfomed with artificial pneumothrax during one-lung ventilation. One hundred one patients underwent esophagectomy in the prone position. One hundred three patients underwent esophagectomy in the left lateral decubitus position. Between the both groups, post operative mobidity and motality were compared and PaO2 / FiO2 ratio (P/F ratios) was calculated as a parameter of the function of pulmonary oxygenation.

RESULTS: The patients who underwent thoracoscopic esophagectomy in the prone position showed significant higher P/F ratio than thoracoscopic esophagectomy in the left lateral decubitus position.

CONCLUSIONS: Thoracoscopic esophagectomy in the prone position was associated with significant better postoperative oxygenation and could be reduce the post operative pulmonary complications.

O22-3

SENTINEL NODE NAVIGATION (SNN) RADICAL SURGERY FOR CARCINOMA OF THE ESOPHAGOGASTRIC JUNCTION

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To clarify the feasibility of determining the precise range of lymph node dissection for carcinoma of the esophagogastric junction, using SNN concept.

Sentinel node navigation; 99mTc-labeled phytate solution, 0.2ml(0.5mCi) per site, was injected at four points around the tumor on a day before surgery. Lymphoscintigraphy was taken in order to examine the lymphatic spread to the superior mediastinum and the neck. Handy type gamma probe was used intraoperatively to identify the SNs.

Subjects; Twenty seven cases with cT1-2N0, junctional cancers were enrolled. Male/female was 24/3. The mean age was 60.6, adeno/ squamous was 25/2, T1/ T2 was 19/8, 15 Barrett cancer. The feasibility of our strategy was examined in relation to the distribution of metastasis among the dissected lymph nodes and the pattern of lymph node recurrence.

SN was absent in the neck and superior mediastinum in 24 cases. They were treated with resection of the lower esophagus and proximal stomach with lymph node dissection of lower mediastinum. SN was detected in the neck in 2 cases. SN was detected in rt paratracheal area in one case. In these three cases, the strategy same as above was applied after negative open or thoracicoscopic biopsy of the SN. Nine cases were pN(+). All these 9 patients had intra-abdominal lymphnodes metastasis, but the mediastinal metastasis was found only in 1 patient. Postoperative chemotherapy was done based on pathological findings. No additional treatment was conducted for pT1N0 patients. Adjuvant chemotherapy was recommended for pN(+) patients. Recurrence was experienced in 3 cases. Carcinomatous peritonitis and pleuritis was found in aT2N1 case. Lung metastasis was found in a pT2N1 case. Paratracheal lymph node recurrence was found in a pT1N1 case.

SNN concept is not absolute, but it is one of promising method to determine of LN dissection range reduction.

O22-4

PREDICTION OF POSTOPERATIVE PNEUMONIA IN PATIENTS RECEIVING NEOADJUVANT CHEMOTHERAPY FOR ESOPHAGEAL CANCER, FOCUSING ON ATROPHIC MUSCULAR CHANGES

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Introduction) In this study, we investigated the relationship between muscular atrophy and postoperative pneumonia, focusing on the cross-sectional area (CSA) of the psoas muscle using computed tomography (CT).

Patients and Methods) Forty-one patients who underwent an esophagectomy following neoadjuvant chemotherapy (NAC) between January 2010 and November 2012 were included in this study. Postoperative pneumonia was defined as 1) the presence of infiltration using a chest X-ray, 2) hyperthermia(38.0° C or higher), and 3)WBC greater than 12000cells/μL. Patients were classified into those with postoperative pneumonia (P group) and those without postoperative pneumonia (C group). The body mass index (BMI), serum albumin, serum CRP, FEV1, decrease in body weight (dBW), and decrease in the CSA (dCSA) of the psoas muscle as measured on a CT scan were compared between the P and C groups. The dBW and dCSA were calculated as follows: (preNAC - postNAC)/preNAC (%). Furthermore, ROC analyses examining the occurrence of postoperative pneumonia were performed for FEV1, body weight change, and CSA change.

Results) Postoperative pneumonia occurred in 11 patients (P group: 11 patients, C group: 30 patients). No significant differences in the BMI, serum albumin, and CRP level were observed between the P group and the C group. The FEV1 was significantly lower in the P group than in the C group (2.0l vs. 2.6l, $P = 0.04$). The dBW and dCSA were higher in the P group than in the C group (dBW: 6.45 vs. 1.13, $P = 0.04$, dCSA: 13.7 vs. 2.0, $P < 0.01$). In the ROC analyses, the cut-off/sensitivity%/specificity%/AUC were 1.50/72/93/0.70 for FEV1, 4.5/63/80/0.71 for dBW, and 7.0/91/73/0.84 for the CSA change. The dCSA was the most suitable parameter for predicting the occurrence of postoperative pneumonia.

Conclusions) Changes in the CSA of the psoas muscle during NAC might be useful for predicting postoperative pneumonia.

O22-5

ESOPHAGECTOMY IN PATIENTS 80 YEARS OF AGE AND OLDER WITH CARCINOMA OF THE THORACIC ESOPHAGUS

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Objective: The puropose of this study was to clarify the indications for an esopggagectomy in elderly patients (especially patients over 80 years of age) with esophageal cancer.

Methods: A total of 1131 patients with esophageal cancer who underwent an esophagectomy by the transthoracic approach were divided into three groups according to age, namely, groups I (<75 years, n=1010), II (75-79 years, n=97), and III (>or=80 years, n=24). In group I, surgery was only done in patients with PS0 or 1, as well as normal cardiac and pulmonary functions.

Results: The morbidity rates of group I, II and III were 40%, 39% and 25%, respectively (P>0.05). Pulmonary complications in each groups occurred in 19%, 21% and 15%, respectively. In group III, the morbidity and 30-day mortality rates were 12.5% and 5.0%, respectively, and pulmonary complications occurred only in one patient each (5%). The hospital mortality retes in group I and II were 5.0% and 8.2%, respectively. (P<0.01) 5 years- overall survival rate in group I, II and III were 33%, 26% and 7%. No significant differences were observed in cause-specific survival.

Conclusions: In the elderly, careful perioperative management is needed while paying special attention to pulmonary complications. However, when the indications for surgery can be strictly determined, an esophagectomy is considered a viable treatment alternative with satisfactory prognosis even in patients 80 years of age and older without any increased morbidity or mortality.

O22-6

EFFECT OF PPI(RABEPRAZOLE) ON REFLUX ESOPHAGITIS AFTER TOTAL GASTRECTOMY

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(Background/Aims) Esophagitis after total gastrectomy has been associated with biliary and pancreatic reflux into the esophagus. The purpose of this study is to clarify the effect of PPI(Rabeparazole) (Eisai,Tokyo,Japan) on these factors in the esophagitis.

(Methodology) Sixteen 8-week old male Wistar rats were underwent total gastrectomy and esophagoduodenostomy to induce esophageal reflux of duodenal juice. In 5 rats the sham operation induced a midline laparatomy alone(Sham). One week following surgery, they were treated with control (saline)(n=8),PPI(Rabeprazole)(n=8)(30mg/kg)ip. 3 weeks after operation, all rats were killed and the esophagus was evaluated histologically. Esophageal injury was evaluated by macroscopic ,microscopic findings and expression of COX2 and PGE2. Esophageal washing was aspirated for the evaluation of bile acid activity.

(Results) At 3 weeks after surgery, duodenal reflux induced esophageal erosions and ulcer formation as well as marked thickening of esophageal wall. The macroscopic ulcer score and histological ulcer length were significantly reduced by treatment with Rabeprazole. The enhanced expression of COX2 and PGE2 in the control group was also markedly inhibited in the Rabeprazole treated group. The bile acid activity in the esophageal lumen was significantly increased in the control group, and this increase was significantly inhibited in the Rabeprazole treated group.

(Conclusion)With this model, we have demonstrated that Rabeprazole significantly reduces inflammation and hyperplasia in the esophageal mucosa. These results indicate that bile acid, which is inhibited by Rabeprazole, plays an important role in the mucosal damage induced by duodenal reflux.

O23-1

NEOADJUVANT CHEMOTHERAPY USING DOCETAXEL/ CISPLATIN/5-FLUOROURACIL FOR SQUAMOUS CELL CARCINOMA OF THE ESOPHAGUS

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Background: Despite improvements in the surgical management of esophageal cancer, the prognosis of patients with advanced disease is still unsatisfactory. Although the benefit of neoadjuvant chemotherapy using the cisplatin/5-fluorouracil (5-FU) regimen has been demonstrated in Japan, docetaxel/cisplatin/5-FU (DCF) or its modified regimens, which we have reported as an effective regimen for unresectable or recurrent esophageal cancer, may be more attractive in the neoadjuvant setting.

Aims: We therefore investigated feasibility and efficacy of neoadjuvant DCF chemotherapy for advanced squamous cell carcinoma of the esophagus.

Patients and Methods: Efficacy, toxicity and postoperative complications of induction chemotherapy for esophageal cancer were investigated. Neoadjuvant DCF chemotherapy was performed for clinical stage III and IV esophageal cancer at Mitsui Memorial Hospital after 2010. The DCF regimen consisted of 60 mg/m^2 of docetaxel and 30 mg/m^2 of cisplatin on day 1, and 300 mg/m^2 of 5-FU on days 1-14. Two courses have been administered as induction chemotherapy in 10 patients, 7 in stage III and 2 in stage II and 1 in stage IVa. Tumor response was evaluated by RECIST v1.1

Results: The response rate was 100% in 10 patients with measurable lesions. Pathological response grade 3 was found in 1 patient, grade 2 in 3 patients, grade 1b in 1 patient, and grade 1a in 5 patients. The pathological stage II/III IV were 7/3/0 respectively. The incidences of grade 3 neutropenia and acute renal failure were 50 and 20%. 5 of 10 patients (50%) were prolapsed in this regimen. The leakage and pneumonia was observed in 1 (10%) and 2 (20%) patients.

Conclusion: DCF can be performed as a neoadjuvant chemotherapy for advanced squamous cell carcinoma of the esophagus because of a high response rate, although feasibility was low and an adequate care for severe neutropenia and renal dysfunction was required.

O23-2

CLINICAL RELEVANCE OF INDUCTION TRIPLET CHEMOTHERAPY FOR ESOPHAGEAL CANCER INVADING ADJACENT ORGANS

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Background.

Esophageal cancer which invades adjacent structures (T4) is not uncommon, but there is no consensus on the standard treatment. Chemoradiation using cisplatin and 5-fluorouracil (CF) is widely used for such cases. Enhanced triplet chemotherapy based on CF may be a beneficial induction treatment as the initial treatment, especially when surgery is considered as adjuvant treatment.

Methods. To investigate the clinical relevance of induction triplet chemotherapy for patients with T4 esophageal cancer, we classified 169 patients with T4 esophageal cancer without distant metastasis into those undergoing chemotherapy using CF plus adriamycin or CF plus docetaxel (79 patients) and those undergoing chemoradiotherapy using CF (90 patients). For the former group, chemoradiation was subsequently applied when surgical resection was not indicated.

Results. Thirty-four patients in the chemotherapy group (43.0%) received chemoradiotherapy following chemotherapy. The response rate tended to be higher in the chemoradiotherapy group, but there was no significant difference between the groups (63.3% vs. 68.9%). Esophageal perforation during treatment was more frequent among the chemoradiotherapy group than the chemotherapy group (16.7% vs. 6.3%, P=0.0379). The rate of surgical resection was consequently higher for the induction chemotherapy group compared to the chemoradiotherapy group (72.1% vs. 45.6%, P=0.0005). There was no significant difference in overall survival between the groups (5-year survival : 23.1% vs. 16.9%, P=0.259), although the chemotherapy group included more patients with distant lymph node metastasis than the chemoradiotherapy group.

Conclusions. Induction triplet chemotherapy reduced esophageal perforation and increased the resectability of T4 esophageal cancers by combining second-line chemoradiotherapy. This strategy might increase the chance of curative resection for patients with T4 esophageal cancer.

O23-3

PALLIATIVE THERAPY FOR ADVANCED ESOPHAGEAL CANCER

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Objective

Multi-modality approach, including surgery, chemotherapy and radiotherapy is essential for treating esophageal cancer. Many patients with advanced esophageal cancer suffer from undesirable symptoms such as dysphagia, vomiting, painful swallowing, either at the time of initial treatment or on the course of treatment. It is important to relieve these difficulties to continue the treatment and to improve the quality of life. The purpose of this study is to discuss the importance of palliative therapy for treating the patients with advanced esophageal cancer.

Methods

Two hundred and seventy-five patients with esophageal cancer who visited our hospital from 2008 to 2012 were analyzed for the involvement of palliative treatment.

Results

The median age of the patients was 66.4 years. Among those patients, 230 were men and, 45 were women. For the initial treatment, about half of the patients have been treated by chemo-radiotherapy, one third of the patients have been treated by surgery, and the remaining patients have been treated by chemotherapy, radiotherapy, and treatments for oncological emergency and best supportive care.

Twenty-three percent of the patients have been consulted with our palliative care team, the symptom of the consultation was pain, fatigue, anorexia, dyspnea, anxiety, sleep disturbance, delirium and so on.

Esophageal bypass surgery, esophageal stent insertion and airway stent insertion were performed 5, 3 and 3 cases, respectively. Most of the patients had relieved from symptom and improved the dysphagia score or dyspnea grade. Among the 5 patients with oncologic emergency diseases, 4 patients recovered from those diseases and received some anticancer treatments.

Conclusion

Palliative therapy for patient with esophageal cancer was effective because it could improve the quality of life and helped them to receive further intensive treatment for esophageal cancer.

O23-4

HIGH STATHMIN EXPRESSION IS ASSOCIATED WITH POOR PROGNOSIS AND DOCETAXEL RESISTANCE IN PATIENTS WITH ESOPHAGEAL SQUAMOUS CELL CARCINOMA

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OBJECTIVE: Stathmin is a major cytosolic phosphoprotein that regulates microtubule dynamics, result in plays an important role in cancer progression and the resistance to microtubule-binding anticancer agents. We aimed to clarify the clinicopathological outcome and prognostic significance of stathmin expression and its resistance properties to docetaxel in esophageal squamous cell carcinoma (ESCC).

METHODS: We evaluated the association between stathmin expression and clinicopathological significance of ESCC by immunohistochemistry in 172 surgical specimens. We investigated the association between stathmin expression and chemoresistance to docetaxel by comparison between 15 biopsy specimen before neoadjuvant therapy using docetaxel and its pathological grading scale of surgical specimen. We also evaluate the resistance property to docetaxel in ESCC in vitro.

RESULTS: High stathmin expression was significantly associated with tumor depth ($P = 0.001$), lymph node metastasis ($P = 0.007$), lymphatic invasion ($P < 0.001$), and venous invasion ($P < 0.001$). Disease specific and overall survival rate of ESCC patients with high stathmin expression was significantly lower than with low stathmin expression ($P = 0.002$, $P = 0.001$). Multivariate analysis showed that high stathmin expression was an independent factor for poor survival ($P = 0.038$). Stathmin expression is inversely associated with pathological response of neoadjvant therapy using docetaxel ($P = 0.028$). Suppression of stathmin expression induces sensitivity to docetaxel in vitro.

CONCLUSIONS: Stathmin plays an important role in the tumor invasiveness and predicted an unfavorable prognosis in ESCC. Stathmin may have potential as a predictive factor for therapeutic response using docetaxel combined chemotherapy in ESCC.

O23-5

COX2: A TARGET FOR PREVENTION AND TREATMENT OF ESOPHAGEAL CANCER-CLINICAL AND EXPERIMENTAL STUDY

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(Aims) Overall survival rate of esophageal cancer ranges from 5% to 10%. The development of preventive and novel treatment strategies is essential. We report experimental and early clinical evidence indicating that COX2 represent a potential molecular target for the treatment and prevention of esophageal cancer.

(Method)Experiment(A):Thirty 8 week old male wistar rats were exposed to duodenal content esophageal reflux. All animal underwent an esophagoduodenal anastomosis(EDA) with total gastrectomy in order to produce chronic esophagitis. In ten rats the sham(Control). They were sacrified at the 35th week. Their esophagi were examined for HE,COX2 and PCNA.

Clinical (B):The expression of COX2 was examined for 68 specimens of esophageal squamous cell carcinoma(ESCC) and the correlation of COX2 expression with clinicopathologic features was examined.

(Result)(A):After 35 weeks of reflux ,columnar dysplasia ,squamous cell carcinoma and adenocarcinoma were found. PCNA LI was higher in dysplastic and cancer tissue than that of normal. Overexpression of COX2 were shown in EDA group. COX2 may play an important role in esophageal cancer by duodenal content reflux.

(B):COX2 immunoreactivity was weak in 27(40%) and strong in 41(60%) of the carcinomas. The proportion of poorly differentiated SCCs among tumors with a strong expression of COX2(34%) was significantly higher than among tumors with a week expression of COX2(19%,p=0.02). The depth of the tumors (p=0.004),lymph node metastasis(p=0.0009) and the stage of the tumors(p=0.001) were advanced significantly more progressively in ESCCS with a strong COX2 expression. Moreover, survival was significantly reduced (p=0.02) among patients with strong COX2 expression when compared with the COX2 weak group. This study showed that strong expression of COX2 was correlated with tumor progression and poor differentiation inESCC.

(Conclusion) Our study suggests that COX2 may play a role in esophageal carcinoma development and progression,COX2 inhibitors may be potential agents for the prevention or treatment of human esophageal carcinoma.

O23-6

PREOPERATIVE ANTI-HEAT SHOCK PROTEIN 70 ANTIBODY IS USEFUL AS A PREDICTOR OF POSTOPERATIVE MORBIDITY IN ESOPHAGEAL CANCER

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OBJECTIVE: Heat shock protein 70 (HSP70) is a molecular chaperone important in host responses to stress, including infection, injury, oxidative damage, hypoxia, and thermal stress. We measured the preoperative serum concentrations of anti-HPS70 antibody in esophageal cancer patients and analyzed their correlation with postoperative morbidity.

METHODS: Serum samples were obtained preoperatively from 50 esophageal carcinoma patients (46 males and 4 females) who underwent potentially curative surgery without preoperative therapy. Serum anti-HSP70 antibody concentrations were measured by enzyme-linked immunosorbent assays (ELISA).

RESULTS: The mean concentration of anti-HSP70 antibody was 187.0 μg/mL. When patients were dichotomized relative to this cutoff, we observed no significant relationships between perioperative inflammatory markers (maximum body temperature, white blood cell count and C-reactive protein concentration) and anti-HSP70 antibody concentration. The serum concentration of alanine aminotransferase, a marker of liver dysfunction, was significantly correlated with anti-HSP70 concentration ($p= 0.0468$). The incidence of postoperative complications was significantly lower in patients with anti-HSP >187.0 μg/mL than <187.0 μg/mL ($p= 0.0336$).

CONCLUSIONS: Serum concentration of anti-HSP70 antibody is useful in predicting perioperative morbidity in esophageal cancer patients.

O23-7

INTEGRATED ANALYSIS OF GENOME-WIDE COPY NUMBER ALTERATIONS AND GENE EXPRESSION IN ESOPHAGEAL SQUAMOUS CELL CARCINOMA

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[Purpose]
Genomic alterations might contribute to the oncogenic process of esophageal squamous cell carcinoma(ESCC). We performed integrative analysis of Copy Number Alterations (CNAs) and Gene Expression (GE) in ESCCs and estimated the impact of these alterations on pathogenesis of ESCC.
[Material and Methods]
We had tumour tissue samples from 57 cases of ESCC. GE profiles were determined using the Agilent Human GE 4×44 K Microarray kit. Genomic DNAs were applied to the Agilent Human Genome CGH244A. We performed GSTIC (Genomic Identification of Significant Targets in Cancer) to identify recurrent CNAs in ESCCs. The correlation between expression and CNA was calculated by statistical analysis to identify the candidate oncogenes and tumour suppressor genes. We assessed the genetic vulnerabilities of those candidate genes using registered data in BROAD institute (www.broadinstitute.org/igp) that estimated the essentiality of 11,194 genes in 102 human cancer cell lines. Furthermore, we investigated the clinicopathologic significance of those candidate genes.
[Results]
We found that ESCCs showed recurrent CNA regions, including gain at 3q26, 7p11, 8q24, 11q11, deletion at 3p14, 9p21. Those gain regions included important oncogenes such as SOX2, EGFR, MYC, CCND1 and deletion regions had some tumour suppressor genes such as FHIT and CDKN2A. The 201 genes were overexpressed with copy number amplification and 448 genes were down-regulated with deletion. The result of analyzing the genetic vulnerabilities of those genes showed overexpression of GRB7 on 17q12 significantly contributed to progression of ESCCs(P = 1.68×10-5). The GRB7 high expression group showed more progression in tumor depth and had a significantly poor prognosis than low group.
[Conclusions]
We found several candidate genes with aberrant expression provoked by CNAs. GRB7 is prognostic factor overexpressed by copy number amplification and should be therapeutic target of ESCCs.

O24-1

THE SAFETY AND EFFICACY OF PERIOPERATIVE ADMINISTRATION OF TOLVAPTAN IN PATIENTS UNDERGOING CARDIAC SURGERY

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[Objective]

Tolvaptan(TLV) is a selective, competitive vasopressin receptor 2 antagonist used to treat hyponatremia associated with congestive heart. When administered with traditional diuretics, TLV was noted to increase excretion of excess fluids without producing side effects such as hypotension or hypokalemia, and without having an adverse effects on kidney function. There were few reports on the utility of TLV in the perioperative management. The purpose of this study was to evaluate the safety and efficacy of perioperative administration of TLV in patients undergoing cardiac surgery.

[Methods and Results]

10 patients after cardiac surgery(CABG:4, valvular surgery:3, CABG+valvular surgery:2, tumor resection:1) given TLV(7.5-15 mg/day) within 5 days in the ICU after surgery were investigated. 7 was given orally, and 3 was through a nasogastric tube. The mean periods of the administration of TLV was 4.8 days(range:1-14 days).

The serum level of Na, K, BUN, and Creatinine were not significant affected by the administration of TLV.

eGFR(ml/min./1.73 m2) significantly increased from 49.8 to 61.4, and the mean urinary volume during 12 hours significantly increased from 982 ml to 1481 ml after the administration of TLV.

[Conclusions]

After cardiac surgery, perioperative administration of TLV was safe and effective on the prompt removal of excess water from third space without affecting serum electrocytes and renal function.

O24-2

RISK FEATURES AND PERIOPERATIVE MANAGEMENT FOR SURGICAL SITE INFECTION AFTER CARDIAC SURGERY

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OBJECTIVE: Surgical site infections (SSIs) caused considerable extra morbidity, mortality and costs. The aim of study was to analyze perioperative features that may lead to a risk of surgical site infection and treatment of perioperative nosocomial infections after cardiac surgery.

METHODS: From June 2004 to July 2012, a total of 982 consecutive patients undergoing cardiac surgery were included in the study, 281 (28.6%) patients underwent surgery for congenital, 181 (18.3%) patients for CABG, 319 (32.7%) patients for valvular surgery, 179 (18.2%) patients for aortic surgery and 22 (2.2%) patients for others. The primary prophylactic antibiotic was used to be a cefazolin or penicillin with sulbactam during 48 hours after surgery. In patients considered at high risk for a staphylococcal infection, vancomycin was used. Wound and blood samples were obtained from patients who had clinical signs suggestive of infection. In the treatment of postoperative infections, the initial empirical therapy to ensure adequate coverage of potentially infective organisms was accompanied by de-escalation until microbiological data become available.

RESULTS: The total incidence of SSI was 13 patients (1.3%). Potential SSI risk factors were identified by univariate analysis. Sternal wound infection occurred in 5 patients (0.5%). Superficial wound infection was diagnosed in 5 patients (0.5%) and deep wound infection in 3 patients (0.3%). Emergency and aortic surgery were independently associated with a risk factor of deep SSI. Bloodstream infections were occurred 17 patients (1.7%). Preoperative methicillin-resistant staphylococcus aureus (MRSA) nasal carriage, emergency and aortic surgery independently associated with bloodstream infections. Of the total SSIs, MRSA was 38%, methicillin-sensitive S. aureus from 30%, gram-negative bacilli from 24%.

CONCLUSIONS: Attention should be paid to emergent, aortic surgery and MRSA carriage to reduce SSIs following cardiac surgery. Continuous clinician's efforts and prolonged infection control programs are very important for prevention of perioperative nosocomial infection after cardiac surgery.

O24-3

NASAL CARRIAGE OF *S.AUREUS* IS INDEPENDENT RISK FACTOR FOR SURGICAL SITE INFECTION AFTER OPEN HEART SURGERY

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Objective:

Staphylococcus aureus (S. aureus) is one of the most common pathogen of surgical site infection (SSI) after open heart surgery. This study was undertaken to evaluate incidence, characteristics, and risk factors of SSI after open heart surgery.

Design:

Retrospective observational study.

Methods:

All patients who underwent open heart surgery between Jan 2007 and Dec 2011 were enrolled in this study. Preoperative and intraoperative variables were evaluated as the possible risk factors of SSI. The definition of SSI was based on proposal by Centers for Disease Control and Prevention.

Results:

Consecutive 518 patients (341 males and 177 females) were eligible to the study. The overall incidence of SSI was 4.6% (24 patients). The mortality rate for patients who developed SSI or not was 25% versus 5.0% respectively (OR 6.2, 95% CI 2.2-17.1, $p<0.0001$). *S.aureus* (15 patients, of which 6 cases were MRSA) was the most common microorganisms causing SSI. Univariate analysis demonstrated following variables as risk factors of SSI; 1) female ($p<0.05$), 2) nasal carriage of *S. aureus* ($p<0.01$), 3) low albumin ($p<0.05$), 4) anemia ($p<0.01$), 5) steroid usage ($p<0.01$), 6) operation time over 75 percentile $p<0.05$). A multivariate logistic regression model analysis identified nasal carriage of *S. aureus* as independent risk factor associated with development of SSI after open heart surgery (OR 2.9, 95% CI 1.1-7.7, $p<0.05$).

Conclusions:

Nasal carriage of *S.aureus* is the important risk factors of SSI after open heart surgery.

O24-4

THE PRESENT SITUATION OF THE PERFORMED CARDIOVASCULAR SURGERY IN OUR HOSPITAL FOR STUDY OF PATIENTS UNDERGOING CHRONIC HEMODIALYSIS

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BACKGRAUND : In late years , the long-term survival of the chronic kidney failure patient improves with the improvement of dialysis technique. Therefore, We present situation of cardiovascular operation for the patient undergoing chronic hemodialysis in our Hospital.

PATIENT AND METHOD : 644 cases were performed cardiovascular operation in our Hospital to January 2007 from December 2011. 33 cases were dialysis patient. 30 case were man in dialysis , 415 case in nondialysis. Diagnosed disease were 37.3% in nondialysis; 42.4% in dialysis with valve, 23.0% ; 27.2% with coronary, 15.8% ; 3.0% with thoracic aortic aneurysm, 10.4% ; 12.2% with abdominal aortic aneurysm, 8.8% ; 12.2 with peripheral artery disease, respectively.

RESULT : There was not the significant difference in an operation type between dialysis group and nondialytic groups. Mortality rate was 3.0% in dialysis group (1 cases) and 5.4% in nondialysis groups (33 cases), this result did not reach to a significant difference. Hospitalization was 30 day in dialysis group and 26 day in nondialysis group; this result did not reach to a significant difference. However, post operative infection rate was 39.9% in dialysis group and 23.9% in nondialysis group; this result reach to a significant difference. ($p<0.05$)

CONCLUSION : We did not recognize significant difference between dialysis and nondialysis both mortality and hospitalization date. It is important to pay attention to postoperative complications including surgical site and remote infection.

O24-5

METABOLIC INTERVENTION FOR WEANING PROBLEMS IN PATIENTS WITH PREOPERATIVE LEFT VENTRICULAR DYSFUNCTION

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OBJECTIVE Adverse outcome after CABG is closely related to postoperative heart failure precipitated by ischemia and myocardial infarction. Restrictive use of inotropes is therefore desirable. In the GLUTAMICS-trial intravenous glutamate markedly reduced the incidence of severe circulatory failure in high-risk CABG patients. Here we report early clinical experience with glutamate as part of a metabolic strategy in CABG patients with preoperative LV-dysfunction facing weaning problems from cardiopulmonary bypass (CPB).

METHODS The metabolic strategy implied that extended CPB and metabolic support with glutamate and glucose-insulin-potassium (GIK) were preferred to inotropes to facilitate post-ischemic myocardial recovery and weaning.

RESULTS Out of 775 consecutive CABG patients operated 104 had preoperative left ventricular ejection fraction (LVEF)< 0.40. Logistic EuroSCORE in patients with LV-dysfunction was 8.3% whereas observed 30-day mortality was 1.0%. In 32 of the patients with LV-dysfunction weaning problems occurred. In these patients LVEF was 0.27 ± 0.05 and 29% had signs of severe myocardial ischemia immediately before surgery. Postoperatively 25% had sustained a myocardial infarction. Cross-clamp time averaged 45 ± 28 minutes and CPB time 128 ± 61 minutes. 91% were treated with intravenous glutamate, 94% with GIK and 22% with inotropes to facilitate weaning. Renal failure (STS-criteria) developed in 3.1%. Logistic Euroscore was 17.7% whereas observed 30-day mortality was 3.1%. Five-year survival was 89% for all patients with preoperative LV-dysfunction and 78% for those with weaning problems.

CONCLUSIONS Weaning problems were encountered in one third of patients with preoperative LV-dysfunction undergoing CABG. By employing substantially extended CPB and metabolic intervention with glutamate and GIK the majority could be weaned without inotropes. Renal function was well preserved and both 30-day mortality and long-term survival was encouraging. The role of individual components of the metabolic strategy remains obscure but this experience is in agreement with the results obtained with glutamate in the GLUTAMICS-trial.

O25-1

PREVENTION FOR PERIOPERATIVE ULNAR NERVE PALSY IN CARDIOVASCULAR SURGERY
心臓大血管手術における術後尺骨神経麻痺の発生因子とその対策

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[はじめに] 2011 年、人工心肺下で心大血管手術を受けた 181 名中 13 名の患者が術後尺骨神経麻痺症状を訴え、いずれも症状は左側であった。

[目的] 人工心肺下の心大血管手術における術後尺骨神経麻痺の発生要因を明らかにし、その対策の有効性を明らかにすること。

[対象]2011 年 1 月から 2012 年 12 月までに人工心肺下で心大血管手術を受けた患者 348 名

[方法] 人工心肺回路による上肢の圧迫を予防する為のアームガードの高さを 2011 年の 6.5 ｃｍから 2012 年には 12.5 ｃｍに変更した。また、体圧測定器を用いて術中の左上肢のベッドとの接触面にかかる圧を測定した。

[結果] 2011 年に発生した尺骨神経麻痺症例 13 件中、弁膜症手術 5 件、全弓部人工血管置換術 5 件、その他 3 件であり、術式や手術時間などに特異的な因子はなかった。アームガードの高さを 12.5 ｃｍに変更した 2012 年には尺骨神経麻痺の発生は弁膜症手術の 1 件のみであった。術中の左上肢にかかる体圧は平均 2.65 ｍｍ Hg であり、アームガードを全く用いない場合（平均 16.8 ｍｍ Ｈ ｇ）より著明に低下した。

[結語] 人工心肺症例における、アームガードの高さが不十分であったことが尺骨神経麻痺の原因と考えられた。その高さを変更することにより尺骨神経麻痺は著明に減少し、有効と考えられた。

O25-2

PREVENTION FOR RETAINED SURGICAL NEEDLE WITH DOUBLE CHECKER IN CARDIOVASCULAR SURGERY
心臓血管外科手術における体内遺残防止への取り組み
- ダブルチェッカーのより安全な使用に向けたマニュアル改訂 -

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[目的] 手術看護学会のガイドラインでは，針カウントは看護師間でのダブルチェックを推奨している。今回，心臓血管外科症例においてダブルチェッカーを用いた，安全で簡便な針カウント方法について検討した。[研究方法] 対象：弁症例の 6 例を担当した看護師 12 名。研究期間：平成 24 年 12 月 11 日～ 21 日。方法：導入後明らかになった問題に対してマニュアルを改定し，担当看護師に質問紙調査を行い改定前後のデータを比較分析した。[結果] 針の目視が困難であるという問題に対しダブルチェッカーをいくつかに分割し，術式により刺す針の本数を調整するカウント方法に改定した。調査結果は，外回り看護師へ「改定前の針カウント方法と比較して目視は容易になったか」の問いに対して，「見やすくなった」5 名（83%），「変わらない」1 名（17%）。器械出し看護師へ「改定前の手技と比較してどのように感じたか」の問いに対して，「手間がかかる」2 名「面倒だ」1 名「目視するためなら仕方がない」5 名であった。（回答複数）[結語] 課題であった目視困難という問題に対しては，容易になったためマニュアル改定は有効であった。しかし，外回り看護師の目視という問題が軽減できた反面，器械出し看護師の問題として準備に時間を要すること等の問題が明らかとなった。今後，器械出し看護師の負担が軽減できる方法を含め，再度マニュアルを検討する必要がある。

O25-3

WOUND CARE FOR THE REFRACTORY INFECTION AT THE EXSIT IN A PATIENT WITH AN EXTRACORPOREAL BIVENTRICULAR ASSIST DEVAICE

両心体外設置型補助人工心臓刺入部に難治性感染をきたした患者に対する創傷ケアの実際

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体外設置型補助人工心臓は、スキンカフで覆われた送血管及び脱血管カニューレが腹壁を貫通し血液ポンプに接続されている。この送脱血管刺入部周囲は感染頻度が高い。今回心筋炎を発症し両心に体外設置型補助人工心臓を装着した患者が、刺入部に感染をきたし治癒困難となったが、認定看護師との連携により改善がみられた事例を経験したので報告する。

離床訓練を開始し車椅子移乗や室内歩行が自己で安定して行えるようになった約７ヵ月後の刺入部の状態は、不良肉芽が形成され、悪臭のある滲出液と、体動などで刺入部痛を認めるようになった。従来刺入部の創傷管理は、心臓血管外科医師と病棟ナースのみで行われていたが通常の方法では回復困難と考え、病棟ナースの中でも指導者層となるナースがコアとなり、チームカンファレンスのもと感染管理認定看護師と皮膚排泄ケア認定看護師に介入を依頼することとなった。

感染管理認定看護師からは感染創のアセスメントと感染拡大防止策の指導、皮膚排泄ケア認定看護師からは刺入部の状態に合わせた具体的な処置方法の指導が行われた。これら認定看護師からの指導内容を周知できるように、コアナースが中心となって病棟スタッフに働きかけることで、ナースは主体的に刺入部ケアに介入できた。その後も医師も含め認定看護師と連携を図りながら創傷管理を継続することで、約２ヶ月半後には刺入部周囲の不良肉芽は縮小し刺入部の状態は改善を認めた。

O25-4

THE CURRENT TRENDS AND PROBLEMS WHILE TRAINING OF NURSING BEGGINERS IN THE INTENSIVE CARE UNIT
ICU における新人看護師教育の現状と課題

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A 病院 ICU では、毎年 3 名の新人看護師が配属される。年間計画に基づき、月単位の到達目標を設定し、プリセプターシップによる指導や勉強会をしている。プリセプターの役割については精神的支援を主とし、知識や技術、管理能力や総合的な看護実践能力に関する教育・指導は、4 年目以上の日勤看護師が日替わりで担当する。勤務終了後に振り返りを行い、当日の指導者が個人の経験ノートに指導内容を記入し、継続されるようにしている。新人看護師は、経験した技術や疾患を経験表に整理し、技術はチェックリストを用いて評価し、知識チェックリストで自己学習をする。月単位の評価表は、「できる」「助言があればできる」「できない」の 3 段階で自己と他者評価を行い、師長、主任、新人教育担当者、プリセプター、新人看護師でカンファレンスを実施し、次の段階に進むか決定する。このカンファレンスは新人とプリセプター、先輩看護師相互の評価のズレを是正する場としている。また、不安や困っていること、体調等を確認し、支援する場としても活用している。病棟全体で新人看護師を育てる為に、毎月のカンファレンス内容を開示し、新人看護師の進行状況と課題、指導方法の共通理解する。今後の課題は、評価のズレを減らすよう評価表の工夫や、プリセプターの評価能力を高めるよう評価者の支援を試みる。倫理的配慮として、対象者に発表の説明を行い、同意を得た。

O25-5

A CASE OF POST HEART TRANSPLANTATION PATIENT WITH EXTRACORPOREAL BiVAD WHO WAS EXCLUDED FROM THE WAITING LIST - FOCUS ON PSYCHOLOGICAL ASSISTANCE
長期補助人工心臓装着中に心臓移植登録除外となった患者の精神的援助に関する考察

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[はじめに] 心不全管理が長期に及ぶ場合はエンドステージと捉え、精神的援助の必要性を示唆する研究結果は多く発表されている。今回、慢性期における症状の急性増悪に対し、治療継続と患者の要望に対応できた症例を経験した。[症例]30 代男性患者、補助人工心臓を装着し心臓移植に至ったが、心機能悪化を繰り返し再度補助人工心臓を埋め込み再移植登録となった。[経過] 右心不全も増悪、気管切開し両心補助人工心臓装着。さらに持続する気道出血のため移植登録除外となる。一方で、持続透析を離脱、嚥下機能の回復など部分的な状態は改善した。患者は長期の治療と改善しない症状に対する絶望、欲求が叶えられない苛立ちを顕わにするようになり、ケアやコミュニケーションの拒絶、粗野な行動の対応に難渋した。不安の傾聴や説明内容の統一等を行ったが改善は見られず、患者は経口摂取を強く希望。そこで、再移植登録を目指す治療を継続しながら経口摂取に取り組み、人工呼吸器装着、気道出血の持続する状況での食事摂取が実現した。また、患者の心情や治療状況について家族との対話を続け、病院の嚥下食を妻が持参する持ち込み食へと変更、患者の言動、行動共に安定した。[結語] 治療を中断することなく患者の要望を取り入れる選択が、患者役割や設定目標の明確化となり精神的安定に繋がった。そしてその選択を支えるには、様々な職種からなるチームの早期結成が今後の課題と思われた。

O25-6

NURSING CARE FOR A TEENAGER PATIENT WITH LVAS WAITING FOR HEART TRANSPLANTATION - OUR EXPERIENCE IN NON-TRANSPLANT HOSPITAL - 心移植待機患の看護　～心移植非認可施設での取り組みの一症例～

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[目的]2010 年 7 月に臓器移植法が改正され、国内での心臓移植件数は増加傾向にある。今回、非認可施設である当院で補助人工心臓（VAS とする）装着中の患者を受け入れることとなり、受入れ準備から移植前に至るまでの取り組みについて報告する。[方法] 受入れ前、心臓移植実施施設での講習会に多職種チームで参加し、VAS 管理の実際について学習した。その後、各職種が専門的視点から勉強会資料を作成し、病棟で勉強会を実施し VAS に関する知識と技術の共有を図った。そして、チェックリストや運用マニュアルを作成し、経験のない移植前看護を提供するための準備を行った。受入れ後、長期化する入院生活援助に重点を置き、チームアプローチを行った。特に精神的支援として、看護師主体で医師、PT、ME、栄養士とともに倫理検討法を用いて多職種カンファレンスを開催し、待機中における問題点を共有する機会をもった。[結果] 受入れ前から、知識と技術の学習体制を整えたことで、どの看護師が担当しても統一した看護が提供できた。長期化した入院期間であったが、多面的にアプローチできたことで精神的援助につながった。[まとめ] 初めての心臓移植待機患者のケースであったが、専門的知識と技術を深め安全な医療を提供することができたのは、多職種がそれぞれの専門性を理解し連携できたことにあると考える。この経験は、次の移植待機患者に対して活かせる症例となった。

O25-7

NEEDS OF NURSING INTERVENTIONS ON COMFORT IN PATIENTS AFTER CARDIOVASCULAR SURGERY

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Objective: To clarify the experiences and needs of patients admitted to the ICU after cardiovascular surgery in order to provide a basis for nursing practice enhancing their comfort.

Methods: Five patients aged under 75 with sufficient verbal communication levels, who were admitted to the ICU after cardiovascular surgery, and whose consent to participate in this study was obtained after explanations of the study outline, were studied. Data were collected through interviews using an originally developed semi-structured questionnaire, focusing on the patients' experiences in the ICU, nursing care they received, and their wishes regarding nursing practice. In addition to these, information regarding their postoperative diagnoses and lengths of stay was collected from medical records. Content analysis was performed to examine their statements during the interviews as transcripts. To enhance the reliability of the study, all study processes were supervised by researchers specialized in nursing and qualitative research, and approved by the ethics committee at the participating facility.

Results: Five categories were extracted in relation to the patients' experiences in the ICU, in addition to 3 regarding nursing care: <the experience of being treated in an environment giving priority to treatment>; <experience of being close to death>; <physical and psychological experiences during treatment>; <physical distress>; and <psychological distress>. Further, regarding their needs, 4 categories were extracted: <recovering from critical conditions>; <maintaining the feeling of self-control>; <establishing a mutual relationship with others>; and <being self-motivated>.

Conclusion: The patients in the ICU needed to establish a mutual relationship with surrounding people, while recovering from critical physical and psychological conditions, suggesting the importance of meeting such needs in nursing practice to enhance patient comfort.

O26-1

WEANING FROM LONG -TERM MECHANICAL VENTILATION, THE ROLE OF NURSING CARE INCLUDING GAIT TRAINING FOR IMPROVEMENT OF PATIENT'S ADL
心臓大血管術後患者における人工呼吸器装着下歩行訓練の有用性

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[はじめに] 近年、高齢およびハイリスク患者の増加により、心臓大血管手術を受けた患者が術後、呼吸不全などに陥り、挿管期間が長期に及ぶ場合がある。そのような患者に対して人工呼吸器装着下での歩行訓練を導入した結果、抜管でき、ＱＯＬの再獲得、退院できた症例を経験したので報告する。[対象患者] 心臓大血管手術後､挿管期間が長期に及び、気管切開術を施行した患者３名。[結果] ３症例ともにＩＣＵで終日Ｔピースが可能な段階まで人工呼吸器離脱ができた。しかし、高炭酸ガス血症や呼吸筋疲労が顕著なため、再度人工呼吸器管理を要する状態を繰り返していた。そのため、ＩＣＵ退室後より呼吸補助筋群の強化目的でＰＴとともに人工呼吸器装着下歩行訓練を行った結果、高炭酸ガス血症を併発することなく人工呼吸器が離脱できた。この過程で、患者は人工呼吸器装着下でトイレ歩行を行い、トイレで排泄を行うなどのＱＯＬの改善が図れた。また、せん妄傾向にあった患者では、立位が可能となった頃よりせん妄症状が軽快するなどの副次的効果も得られた。その他、歩行訓練開始に伴う心機能の変化は心エコー上みられなかった。[結論] 心臓大血管術後患者に対して廃用症候群やＩＣＵ―ＡＷなどの合併症予防目的で循環動態が安定した段階から人工呼吸器装着下での歩行訓練を導入していくことは患者のＱＯＬ改善、向上につながり、有用であると考えられる。

O26-2

THE NEW CONCEPT OF PERI-ANESTHESIA NURSING IN RELATION WITH SPECIALIZED CARE WITH ANESTHESIOLOGISTS IN JAPAN

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INTORDUCTION WITH HYPOTHESIS

The operation has been increasing day by day, however skillful and young anesthesiologist are very limited in Japan. Medical organization in surgery is also in a critical situation. This conditions of medical workers cause fewer and fewer young doctors from wishing to become surgeons and anesthesiologists. This vicious cycle places an increasingly heavy burden on peri-operative care personal.

In spite of this critical situation, no significant improvements have been made. It is imperative that we adopt a new concept of peri-anesthesia nurses that is suitable for the medical field.

METHODS

Members of PPCS (Peri-operative Patient Care Specialist) who participated in skill improvement seminar completed a questionnaire regarding actual work conditions of nurses involved in peri-operative care, as well as attitudes toward the expansion of nursing services in the area of peri-operative care.

RESULTS

The 43 respondents consisted of 41 nurses and 2 doctors, of which over 90% were involved in operations.

28 items in the list of medical practices were considered low-risk and were currently being performed. 11 items were considered high risk practices requiring specialized skills and weren't currently being performed.

The overall response to the expansion of nursing care was positive, stating improvements in nursing technology and knowledge lead to better medical service. At the same time, concern was expressed regarding plausibility due to the poor educational environment for nurses as well as employment options upon becoming qualified.

DISCUSSION AND CONCLUSION

We created a new concept of the society with PPCS in relation to anesthesiologists, nurse, surgeons, and others. This questionnaire yielded an overwhelmingly positive response regarding nursing expansion in peri-anesthesia care, suggesting the need for increased efficiency in medical service and promotion of medical safety. Development of an educational curriculum, as well as a structure for the safe execution of specialized care is necessary.

O26-3

THE CURRENT SITUATION AND FUTURE PERSPECTIVE OF PERIOPERATIVE / PERIANESTHESIA NURSING IN JAPAN

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Introduction:

In Japan, paramedical role allotment is attracting attention from the efficient doctors in connection with the doctor shortage, and the argument of having Advanced Practice Nurses in Japan is being pushed forward.

Nurses undertake many roles in cooperation with surgeons, anesthesiologists, and other types of workers in the perioperative domain, but with medical advances, the diversification of doctors' duties enlarges the work demanded from nurses.

Purpose:

The purpose of this research w to review a precedent study about the role of nurses engaging in the perioperative domain in Japan and current activities. In addition, the clarification of the present conditions and the problems of in the perioperative nursing domain in Japan compared with the situation in foreign countries.

Methods:

We searched for precedent studies of the past 5 years with a document retrieval engine. We classified search results in to "surgery duties" and "anesthesia duties" and then classified nursing duties. Furthermore, we extracted perceived problems from each document.

Results:

Japanese nurses often undertake many roles in each domain, including surgical environments. However, the role of nurses has become specialized in many foreign countries, and in each of those countries, nurses with specialized qualifications have played an active part in society. In the countries studied, it was found that nurses had help with indirect non-nursing duties, whereas in Japan nurses were required to perform both direct nursing care as well as indirect duties.

Discussion

We believe nurses in Japan should be allowed to focus more on direct care of patients.

O26-4

A STUDY OF PSYCHOLOGICAL STATE OF MOTHERS WITH PRENATALLY DIAGNOSED FETUS AS HAVING COMPLEX CONGENITAL HEART DISEASE

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OBJECTIVE: Advances of fetal echocardiography have allowed to achieve the development of adequate management strategies and the improvement of outcomes in the treatment of neonates and infants with difficult complex congenital heart disease. Social and psychological supports to mothers and their family with prenatally diagnosed fetus, however, seem to be undeveloped unfortunately. We reviewed maternal conditions in that their child had fetal diagnosis as having congenital heart disease and surgically treated soon after birth. METHODS: Seven mothers were included and interviewed in an outpatient clinic in one to six months after successful heart surgery in their babies. Diagnosis included HLHS in 2, Ebstein's anomaly in 1, TGA in 1, Taussig-Bing anomaly in 1, Coarctation with single ventricle in 1 and complete AVSD in 1. Data were analyzed according to chronological changes in mental and psychological aspects of mothers. RESULTS: The time-interval was 10.0±2.9 weeks between the fetal diagnosis and the birth. The psychological state of mothers was chronologically divided into three phases. At the time of fetal diagnosis, the "stunned" state was noted as they could not receive any information because of unexpected "bad news" and complexities of the disease of their own babies. The second stage was "anxiety and confusion" which continued until discharge from hospital after successful surgery. Finally, they accepted and realized their baby's condition including future problems as it was. CONCLUSIONS: It might be important for doctors and nurses to keep in mind that the fetal diagnosis can be "bad news" for mothers and their family while it might be of great use in helping rescue critically-ill babies with complex congenital heart disease.

O26-5

SUPPORT FOR THE DECISION-MAKING OF ELDERLY PATIENTS UNDERGOING CARDIAC SURGERY

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Purpose: The purpose of this study was to examine factors influencing the decision-making of elderly patients undergoing cardiac surgery, and discuss support required to help them with such decision-making.

Methods: Subjects were patients aged 65 to 80 years old who had undergone cardiac surgery during the period from two to six months before the survey. Semi-structured interviews were conducted using an originally developed questionnaire to obtain data, and the interview results were analyzed based on a qualitative inductive method. In consideration of research ethics, the present study was conducted with the approval of the research ethics committees of Hiroshima University and the institutions that cooperated in the study.

Results: 1. Subjects were three males and two females (a total of five patients), and the mean age was 73.4 years old (SD=2.1). Three patients underwent coronary artery bypass surgery; the surgical removal of an atrial tumor was conducted in one patient, and the other patient underwent the removal of a left ventricular aneurysm.
2. Seven categories of factors influencing the decision-making of elderly patients undergoing cardiac surgery were extracted: [recognition of severe symptoms by patients], [recognition of the importance of cardiac surgery], [being assured that cardiac surgery is safe], [wish for the restoration of health], [to reduce the burden on the family], [allowed to take days off work for surgery], and [afford to undergo surgery financially].

Conclusion: To support the decision-making of elderly patients undergoing cardiac surgery, it is important to help them understand and accept it, and encourage them to identify the meaning of undergoing the surgery.

O26-6

ASSESSMENT OF ILLNESS PERCEPTION BY PATIENTS UNDERGOING THORACIC AORTIC ANEURYSM SURGERY: ANALYSIS ON THE BASIS OF AN INTERVIEW SURVEY 6 MONTHS AFTER DISCHARGE

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OBJECTIVES: The perspective from which patients' view their own disease is called "illness perception," and it has been suggested that the strategy for managing their disease may differ, and their QOL standards vary, according to their own perception. It is possible that the postoperative recovery, QOL, and even medical care management behavior of patients undergoing thoracic aortic aneurysm surgery may also be affected by the patients' perception and understanding of their disease and surgery. The aim of this study was to assess the characteristics and composition of the concept as a step prior to conducting a quantitative assessment of the illness perception of patients undergoing thoracic aortic aneurysm surgery.

METHODS: We performed a secondary analysis of data collected in a previous study (Miura, 2010). The 6-month post-discharge interview survey data of 16 patients undergoing thoracic aortic aneurysm surgery (11 males, 5 females), mean age 66.1 ± 8.2 years, were analyzed in a qualitative induction according to the 5 dimensions in the illness perception framework of the Leventhal self-regulatory model.

RESULTS: The illness timeline and cure and control were greatly affected by physical problems, such as postoperative complications, that the patient experienced after being discharged. In the cause of the illness there were individual differences in their causal attribution, such as unsuitable lifestyle habits in the past, or a pedigree that made the patient prone to vascular diseases. Illness identity was influenced by the difficulty of perceiving an aortic disease that is asymptomatic unless a rupture or dissection occurs.

CONCLUSIONS: The characteristics of the illness perception of patients undergoing thoracic aortic aneurysm surgery were elucidated by this study. In the future it will be necessary to elucidate the structure of illness perception by making comparisons with patients who have different diseases, and quantitative research will be necessary to do so.

O26-7

UNDERSTANDING OF RISK PERCEPTIONS TO ENHANCE RISK COMMUNICATION FOR CARDIAC PATIENTS

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Patients' understanding of the causes of their coronary heart disease (CHD), casual attributions, has been associated with more congruent risk reduction behaviours and improved health outcomes. This article aimed to assess causal attributions for CHD of Middle Eastern women diagnosed with heart disease. Using a survey methodology, 121 female patients in cardiac units of three public hospitals in Iran and Australia completed a questionnaire concerning causal attributions for CHD, as applied to themselves and women generally. Clinical data were collected from the patients' medical record and the Depression, Anxiety and Stress Scale (the DASS) was used to assess the psychological status of participants. Despite being hospitalized with a diagnosis of CHD and having a high burden of risk factors, study participants had limited awareness of their personal risk factors. Overall, 47%, 26% and 9% of participants either inaccurately denied or were uncertain of having hypercholesterolemia, diabetes and hypertension respectively. Only 6% of participants attributed their heart disease to lifestyle factors whilst above half attributed their disease to stress (55%). Participants were more likely to have accurate casual attribution when they applied the risk to women generally than themselves. Middle Eastern women in this study showed inaccurate casual attribution to CHD, particularly when they applied the risk to themselves. A clear specification of risk target is imperative to allow for more accurate assessment of risk perception among cardiac patients. Culturally and linguistically appropriate risk communication programs are suggested to improve Middle Eastern women's understanding of their risk factors,

O27-1

A SURVEY OF EXTRACORPOREAL MEMBRANE OXYGENATION ACCIDENT IN INSTITUTIONS WITH MEMBER OF THE JAPANESE SOCIETY OF EXTRA-CORPOREAL TECHNOLOGY IN MEDICINE

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[INTRODUCTION] In Japan, extensive research has not been conducted on ECMO accidents.

The Japanese Society of Extra-Corporeal Technology in Medicine (JaSECT) questionnaire survey was intended to grasp the reality of ECMO in domestic medical institutions to help dissemination of safety measures in 2012. In this survey, the prognosis of patients has not been performed.

[METHODS]

Replies was requested for ECMO cases performed in 2009 and 2010 from 592 institutions to which a regular JaSECT member belongs. We conducted the questionnaire with about 29 questions (accidents, causes, correspondence, and maintenance management of equipment).

[RESULTS]

The questionnaire recovery rate was 60.3%. As for the number of ECMO cases, in 2009 there were 2893 cases, and 2010 there were 2957 cases. The incidence of accidents was 6.3%.

Of the accidents 48% of facilities reported "no incidents" over two years. Facilities that have experienced "sudden pump stop" were 8.1%. As for the cause, pump blood clot numbered 8 cases, and pump trouble numbered 7 cases. There were 11 circuit exchange cases for emergency response, and 9 device conversion cases. In addition, the facility that experienced "accidental air entry" was 6.2%. Cases where the air remained in the preliminary stage amounted to 7 cases, and there were 6 case of air entry from a venous circuit. There were 13 follow-up cases of correspondence, and air removal from a circuit numbered 7 cases.

[CONCLUSIONS]

Compared with the incidence rate of accidents (2%) of CPB in Japan, the rate of incidence in ECMO is high. The factor is probably caused by emergency, long-term management, the exchange of a circuit and the oxygenator along with it, patient movement, over-management by personnel from a number of specialties. In future, there will be a need for continued research within JaSECT.

O27-2

VARIATION OF THROMBUS SIZE IN AN EXTRA-CORPOREAL VENTRICULAR ASSIST DEVICE

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[OBJECTIVE]

Thromboembolism is one of the most serious late complications after left ventricular assist device (LVAD) implantation. We had had an impression that the size of thrombus attached to an extra-corporeal LVAD pump becomes larger in the midnight or early in the morning. The aim of this study was to reveal whether there was a circadian rhythm in the thrombus size.

[METODS]

We retrospectively studied an extra-corporeal pump (NIPRO LVAD) used for a 27-year-old man with dilated cardiomyopathy. In this patient, thrombus attached to the membrane of the pump was skechted and recorded 3 times a day. From July 2009 to September 2010, we scanned 963 sketched records of thrombus in the LVAD pump. We then measured the are of the thrombus with a commercially available software(Adobe Photoshop CS6). The thrombus area were classified into three groups according to the time of the sketch made: group M (in the morning), group D (during the day time), and group N (in the night). One-way analysis of variance (One-way ANOVA) was used to examine a difference of a mean thrombus area (pixel) among three groups. This examination was performed about the front side and the rear side of the LVAD pump.

[RESULTS]

There was a significant difference among three groups in the front side of the LVAD pump (P=0.04).

[CONCLUSIONS]

This study suggested that there is a circadian rhythm of thrombus size in the front side of the LVAD pump.

O27-3

FLOW ANALYSIS OF ARTERIAL PERFUSION CANNULAS IN DIFFERENT CANNULA TIP DIRECTIONS

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[OBJECTIVE]

The aim of this study is to analyze flow from the new arterial perfusion cannula (Stealthflow cannula) using two flow visualization methods and to elucidate effect of cannula tip direction on flow in the aortic arch.

[METHODS]

Particle image velocimetry (PIV) and high-speed video image analysis was used to analyze flow dynamics in the mock aortic model. Flow pattern, velocity distribution, streamlines and degree of turbulence (root mean square value: rms) in different shape cannulas were evaluated in a glass aortic arch model. We compared flow parameters in two different dispersive type cannulas; Stealthflow and Dispersion cannula. Flow dynamic parameters in two different directions (aortic root direction and aortic arch direction) were also evaluated.

[RESULTS]

A large vortex and regurgitant flow were observed in the aortic arch in both Stealthflow and Dispersion cannula directing cannula tip toward the aortic arch. Moderate jet flow of the maximum velocity 0.5 m/s hit the minor curvature in both cannulas in arch direction. High rms area was observed around the cannula tip. When cannula tip was directed toward the aortic root, maximum velocity in the aortic arch was lower in Stealthflow than that in Dispersion cannula. Streamline in the aortic arch was linear with low rms and velocity distribution in the arch was sound in both cannulas. However, flow velocity was high and rms was large in aortic root. Streamline of PIV and flow pattern in high-speed video analysis was the same in both cannulas and both directions.

[CONCLUSIONS]

Stealthflow cannula generates linear and sound flow pattern in the aortic arch when cannula tip was directed toward the aortic root. PIV in the glass aortic model is a useful tool to analyze flow in different shape cannulas. PIV method generated similar results with high-speed video imaging.

O27-4

VISUALIZATION OF PERFUSION RELEVANT MANIPULATIONS ON THE ASCENDING AORTA

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Objective:

To visualise the flow conditions in the ascending aorta during extracorporeal circulation.

Postoperative neurologic dysfunctions are the most serious complications following heart surgery. Surgical manipulations on the pathological altered aorta could be identified as common causes for neurological disorders.

Typical iatrogen aortic lesions are:

- The insertion of a perfusion cannula in the aorta
- The insertion of an aortic root cardioplegia cannula in the ascending aorta
- The aortic crossclamping
- The partial clamping of the aorta
- The incision and closure of the aorta during aortic valve replacementAbstand

Many studies based on ultrasonic measurements identified solid particles and gaseous microemboli as a possible source for cerebral embolization.

Methods:

For the simulation of an intraoperative situation we used 5 human cadaver aortae. These were cannulated in a typical surgical manner and connected to a perfusion circuit.

An endoscopic camera was introduced through the right coronary ostium or the apex of the left ventricle to allow an insight into the perfused aorta. With this setup we were able to show in detail different perfusion relevant situations, e.g. the cannulation procedure of the aorta, the total and partial aortic clamping and the deairing with a cardioplegia cannula directly from inside the aorta.

Results:

With our experiment, we were able to visualize the turbulent flow conditions in the aorta during extracorporeal circulation. Furthermore, we could show that in particular the clamping of the aorta may lead to endothelial damage.

Conclusion:

The cannulation of the aorta represents a considerable mechanical stress on the vessel wall. Using special aortic cannulas may help to reduce this trauma. Some techniques that are routinely used during extracorporeal circulation, e.g. the deairing of the aorta with a cardioplegia cannula, should be reconsidered. This multimedia presentation gives an insight into the human aorta viewed from an extraordinary perspective.

O27-5

FUNDAMENTAL RESEARCHES FOR RECONSIDERATION OF OPTIMAL FLOW RATE IN PEDIATRIC CARDIOPULMONARY BYPASS -- FROM THE VIEWPOINT OF PREOPERATIVE CATHETER DATA --

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OBJECTIVE

In the late 1950s, many researchers were investigated about optimal flow rate on cardiopulmonary bypass (CPB). When reviewing this literature, determining optimal flow rates is most commonly derived from the preoperative cardiac index (C.I.) of the individual patients. With advances in pediatric heart surgery, consideration must allow for the fact that pediatric cardiac surgery cases are becoming more complex and that the patient population is trending towards lower birth weight babies. With this consideration in mind, we thought that it might be necessary to reconsider the earlier established standard and determine whether or not it is suitable to current situations in pediatric CPB. As a first step, we calculated the predicted C.I. of patients who underwent pediatric cardiac surgery from existing cardiac catheterization data, allowing us to be able to establish the necessary optimal flow rates for their respective surgeries.

METHODS

The patient population in our retrospective study included 1,278 children who underwent pediatric cardiovascular surgery. The preoperative catheter data; "SvO2, SaO2, and hemoglobin values" were extracted from our pediatric cardiac surgery database. The oxygen consumption rate was derived from Clark's oxygen consumption curve according to each patient's body weight, and their C.I. was calculated using the Fick equation.

RESULTS

Statistical analysis, failed to demonstrate any correlation between patient weight and C.I. It was noted however, that the calculated C.I. range was approximately 2.42 - 4.31 L/min/m2 in each classification. The peak cardiac index "4.31 L/min/m2" was associated with patients in the 12-13 kg range. This suggest that patients in the weight range of 12-13 kg might need to be perfused at higher cardiac perfusion rates.

CONCLUSIONS

A usual perfusion index was much less than Cardiac Index. A peak of required flow rate differed with peak of Clark's oxygen consumption curve.

O27-6

PREPARATION OF STARTING PERFUSION DATABASE IN JAPAN

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[Objective]Japanese Perfusion Database is planned to implement in order to provide safer and quality healthcare by means of establishing expertise of perfusionists based on Evidence Based Medicine (EBM). Thoracic surgery database already exists, but registry items are not enough for perfusionists. Japanese Society of Extracorporeal Technology in Medicine (JaSECT) aimed for a construction of a new database, and in 2011, JaSECT conducted a research to 557 facilities where the members belonged regarding current status of perfusion use and registry items of the database. Based on the results, JaSECT selected registry items witch eyed the international collaboration and built the database with special attention to user-friendly interface.

[Methods]Before the start of Japanese Perfusion Database in April, 2013, 6 facilities have started trial implementation to test the usability of the database. Database was created using FileMaker Pro. The numbers of registry items were approximately 150. In addition to data registry, several perfusionists registered data on randomly selected 10 open-heart surgery cases respectively, and questionnaire study was conducted on the subject of input time and any defects.

Consistency was also compared in inputting the same cases. Once we obtained the information based on the questionnaire, final adjustments of Perfusion Database were made.

[Results& Conclusions]Japanese Perfusion Database was built and approaches for its operation are in the process. Accumulation of accurate data is crucial for an accurate epidemiological analysis. The establishment of Japanese Perfusion Database of JaSECT leads the accumulation of standardized epidemiological data in Japan and this also leads the safer and quality technique of perfusionists.

♥ O28-1

SINGLE STAGE REPAIR FOR TRANSPOSITON OF THE GREAT ARTERIES, VENTRICULAR SEPTAL DEFECT AND VARIANTS WITH AORTIC ARCH HYPOPLASIA USING AUTOLOGOUS INTERDIGITATING ARCH RECONSTRUCTION

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OBJECTIVE

Transposition of the great arteries (TGA), ventricular septal defect (VSD) or Taussig-Bing anomalies associated with aortic arch hypoplasia and coarctation of the aorta remain a challenge for single stage repair, especially in conditions where homograft tissue is not available. We present a novel aortic arch reconstruction technique utilizing autologous tissue which results in a tension free repair, and a decreased chance of significant post-operative recoarctation.

METHODS

Since July 2012, four patients with TGA, VSD, and four patients with Taussig-Bing anomalies associated with aortic arch hypoplasia and/or coarctation of the aorta underwent single stage repair utilizing regional cerebral perfusion technique. The aortic coarctation was resected, and the aortic arch reconstruction was performed by a modified interdigitating technique. The neo-aorta was reconnected with the undersurface of the arch and the descending aorta using autologous tissue.

RESULTS

One patient died on postoperative day tree because of coronary ischemia. The remaining patients were all stable after their one-stage repair and completed follow-up evaluation. At a median follow-up of 4 months, all patients were alive and require no reoperation. 2D echocardiography showed good cardiac function with trivial neo-aortic valve insufficiency in 5 patients and mild insufficiency in 2 patients. The measured gradient pressure across the coarctation repair in 7 patients during follow-up was 8.5 ± 3.6 mmHg.

CONCLUSIONS

We believe that the autologous interdigitating aortic arch reconstruction technique provide an alternative technique for single stage repair of TGA-VSD or Taussig-Bing anomalies associated with aortic arch hypoplasia and/or coarctation of the aorta. This procedure should also allow for normal growth and development of the aorta. However, long-term follow up of a larger cohort of single stage aortic arch repair is warranted.

♥ : Travel Grant

O28-2

AORTIC ARCH REPAIR AND PULMONARY ARTERY BANDING IN NEONATES WITH FUNCTIONALLY SINGLE VENTRICLE AND AORTIC OBSTRUCTION

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Background: Outcomes of functionally single ventricle (f-SV) associated with aortic arch obstruction have been suboptimal. We assessed our surgical strategy of an isolated arch repair and pulmonary trunk banding (PAB) in neonates with adequate subaortic tract.

Patients and Methods: Among forty-three patients with f-SV had aortic arch obstruction except hypoplastic left heart syndrome, aortic arch repair and PAB was performed at the median age of 2 days (range 0 to 37 days) in 30 patients with adequate subaortic tract, while the Norwood-type procedure was undertaken in 13 patients with significant subaortic obstruction (SAS).

Results: Two patients died with early mortality of 6.5%. The extended end-to-end anastomosis with or without distal arch augmentation with a carotid flap was performed in 18 patients and subclavian flap aortoplasty was performed in 12 patients. The circumferential length of the band was body weight plus 16.8±1.0mm. Cardiopulmonary bypass was used to relieve pulmonary venous obstruction in 2 patients. Freedom from bidirectional cavopulmonary shunt (BCPS) and Fontan completion was 7.7±5.2% at 12 months and 14.5±7.8% at 3 years respectively. Although SAS had not developed in any patients after an initial palliation, Damus-Kaye-Stansel anastomosis was prophylactically performed at the time of BCPS (n=15) and Fontan procedure (n=4) in 19 patients in whom the future development of SAS could not be negligible. Surgical intervention was performed to relieve recurrent arch obstruction in 3 patients (10.0%). The survival rate was 72.0±8.5% at 5 years.

Conclusions: An isolated arch repair and PAB in neonates following an individual evaluation of the subaortic region yielded an excellent achievement rate of both BCPS and Fontan procedure without apparent SAS. Our individual approach depending on the existence of the important SAS in neonates with f-SV and aortic arch obstruction could be reasonable and beneficial in minimizing the disadvantages related to Norwood procedure.

O28-3

PALLIATIVE ARTERIAL SWITCH USING BILATERAL PULMONARY ARTERY BANDING FOR COMPLEX TAUSSIG-BING ANOMALY

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Although definitive arterial switch for typical transposition of the great arteries with ventricular septal defect (VSD) is established surgical treatment, we sometimes encounter difficult cases of double outlet right ventricle (DORV) with subpulmonary VSD (Taussig-Bing anomaly). Also, concomitant anomalies such as small body weight, interruption of aortic arch, and atypical coronary configurations render the repair more challenging. For these complex cases, pulmonary artery banding has been used as a palliation. Pulmonary artery banding above the future aortic valve, however, bears risks of neo-aortic valve regurgitation and/or contingent coronary injury at the time of definitive repair.

As such, we herein present two cases of complex Taussig-Bing anomaly (2.8 kg female: DORV with subpulmonary VSD, Shaher type 9 coronary artery, CoA, hypoplastic arch; 2.4 kg male: DORV with subpulmonary VSD, Shaher type 7b coronary artery), both of which underwent arterial switch by the Lecompte maneuver followed by bilateral pulmonary artery banding as the first palliation to avoid aforementioned complications. Both cases successfully completed definitive repair and had uncomplicated postoperative courses. Recently, bilateral pulmonary artery banding has widely been applied for small neonates with hypoplastic left heart syndrome. With ample experience of bilateral pulmonary artery banding and its repair, our surgical approach can be safe and useful treatment of choice for complex Taussig-Bing anomaly.

O28-4

ADVANTAGE OF THE NORWOOD PROCEDURE FOLLOWING BILATERAL PULMONARY ARTERY BANDING, COMPARED WITH NORWOOD WITH GLENN PROCEDURE

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[Objective]We compared the results of two policies of the Norwood procedure and the Norwood with Glenn (NG) procedure following the bilateral pulmonary artery banding (bPAB) in patients with hypoplastic left heart syndrome (HLHS).

[Methods]Twenty-two patients of HLHS underwent bPAB between October 2006 and January 2012. We divided the patients into 2 groups. N group includes 13 patients who were planed the Norwood procedure following bPAB, and NG group includes 9 patients who were planed the NG procedure following bPAB.

[Results]<N group > Thirteen patients underwent the Norwood procedure at 1.3±0.7 months. Six of the 13 patients underwent bidirectional Glenn (BDG) procedure at 5.9±2.0 months, 3 patients are waiting BDG, and 4 patients died before BDG procedure. One of the 6 patients after BDG procedure achieved Fontan procedure and the other 5 patients are waiting Fontan procedure. Only 1 patient needed pulmonary artery repair after the Norwood procedure. < NG group > Three patients died before the NG procedure because of desaturation. Six patients underwent NG procedure at 3.3±0.2 months, and 1 of the 6 patients achieved the Fontan procedure. The other 5 patients died. Two of the 5 patients died because of desaturation due to peripheral pulmonary artery stenosis.

Actuarial survival was 69.2%(N group) vs 22.2%(NG group) at 1 year (p=0.046). Pulmonary artery index after BDG was 178±39.0 (N group) vs 87.3±23.8 (NG group, p=0.012).

[Conclusions]The results of the Norwood procedure following bPAB was better than the NG procedure. Norwood procedure following bPAB is supposed to be more advantageous especially for the growth of pulmonary artery than the NG procedure.

O28-5

SALVAGE PROCEDURE FOR HIGH RISK PATIENTS WITH COMPLEX CARDIAC ANOMALY

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OBJECTIVE

In recent years, surgical treatment of congenital heart disease has been developed dramatically. Surgical results have been improved by taking the staged repair. Recently hybrid procedure was attributed the better outcome for more complex combination. We present following three type operations such a focus on "salvage" surgery.

CASES

(1)Bilateral PA banding in high risk patients with HLHS High-risk neonates undergoing the Norwood stage 1 still face a mortality rate of 20-50%. Bilateral pulmonary artery banding might attribute early successes with the hybrid approach for high-risk patients as a less-invasive initial procedure to improve outcomes. Regarding this, high risk patients (N-=15) were preferred to undergo hybrid procedure as a first palliation followed by rapid stage Norwood procedure within one months.

(2)Stent insertion to vertical vein in patients with obstructive TAPVC Obstructive TAPVC repair for the patients with heterotaxy syndrome was found to be negative consequences, especially within three months of age.

We did stent insertion to vertical vein in two patients having obstructive TAPVC and PA. Then delayed TAPVC repair achieved successfully.

(3) Stent graft insertion using novel technique for recurrent pulmonary venous obstruction A 5-year-old girl underwent surgery for supra-cardiac TAPVC. Despite three times surgical intervention, serious PVO was developed. Under cardioplegic circulatory arrest, at first bare stent was inserted and expanded, then PTFE graft was inserted at the inside of that. After that another bare stent was inserted at the inside of PTFE tube graft and expanded, as like stent-in-stent technique.

CONCLUSIONS

As increasingly complex congenital heart disease is considered an increase in life-saving surgeries like this. It is important to determine the indications for surgery are also careful.

O28-6

RISK FACTORS FOR PERSISTENT PLEURAL EFFUSIONS AFTER THE FONTAN PROCEDURE: AN INDONESIA EXPERIENCE

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OBJECTIVE: This study investigates the association between selected preoperative, operative, and postoperative variables and persistent pleural effusions after the Fontan procedure.

METHODS: We conducted a retrospective study of Fontan procedures. The variables analyzed as potential risk factors included age and weight at the time of the operation, anatomic diagnosis, preoperative oxygen saturation, mean pulmonary artery pressure, ventricular end-diastolic pressure, presence of an accessory source of pulmonary blood flow, presence of significant aortopulmonary collateral vessels, presence of fenestration, cardiopulmonary bypass time, conduit size, postoperative pulmonary artery pressure, use of angiotensin-converting enzyme inhibitors, use of sildenafil, and presence of postoperative infection. The outcome measures evaluated were duration, volume of chest tube drainage and length of hospital stay after surgical intervention.

RESULTS: From January 2009 to November 2012, 42 consecutive patients underwent the Fontan procedure. The median age at operation was 6 years. The median duration of chest tube drainage was 14 days, and the median volume of drainage was 16 mL/kg/day. Diagnoses included tricuspid atresia in 29 per cent, pulmonary atresia in 12 per cent, and double-outlet right ventricle in 12 per cent. As determined by means of multivariate analysis, significant risk factors for pleural effusions lasting more than 2 weeks was age <= 4 years old (P <=.005). Significant risk factors for pleural effusions draining at more than 20 mL/kg/day was age <= 4years old (OR 0.16, p = 0.013). Significant risk factors for longer hospital stay was only age in univariate analysis (p = 0.037), but if we go to multivariate analysis, age is not a significant risk factor (p = 0.09).

CONCLUSIONS: Only age which is consistently being the risk factor for pleural effusions lasting more than 2 weeks and for pleural effusions draining at more than 20 mL/kg/day.

O28-7

AGGRESSIVE ADMINISTRATION OF HOT, PULMONARY VASODILATOR AND ANTI-HEART FAILURE DRUGS FOR FONTAN CANDIDATES

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(Objectives) To assess our strategy in the treatment of Fontan candidates with aggressive administration of HOT, pulmonary vasodilator, and anti-heart failure drugs.

(Methods) Twenty-nine patients undergoing Fontan operation in Kitasato University Hospital between 2003.9 and 2012.8 were reviewed. For the high-risk patients (Group HR, n=8) with elevated pulmonary resistance and heart failure, anti-heart failure drugs were administrated in addition to HOT and pulmonary vasodilator. The data of high-risk patients was compared with that of standard risk patients (Group SR, n=21).

(Results) Average age at Fontan operation was 17.1± 5.1 months. There was no hospital death. Actuarial survival rate and freedom from reoperation were 96.4% and 89.0%. The comparison in pre Fontan catheter data did not reveal any significant differences beween the two groups. (HF vs SR: PAP 11.7 ± 3.1 vs 10.5 ± 1.7 mmHg, p=0.22, Rp 0.9± 0.1 vs 1.4 ± 0.7 U·m2, p=0.08, EDP 8.6 ± 3.5 vs 5.9 ± 2.9 mmHg, p=0.051, EF 60.6± 15.4 vs 60.1 ± 9.4 %, p=0.92) Average drainage tube indwelling and hospital stay were longer in Group HR, but not significantly. (HF vs SR: chest tube indwelling 11.3± 6.4 vs 9.1± 8.9 days, p=0.55, hospital stay 31.6± 28.1 vs 22.0± 12.9 days, p=0.22) The comparison in post Fontan catheter data did not show any significant differences beween the two groups. (HR vs SR: PAP 12.0 ± 3.5 vs 11.1 ± 2.3 mmHg, p=0.44, Rp 1.4± 0.7 vs 1.7 ± 0.6 U·m2, p=0.32, EDP 6.2 ± 3.7 vs 6.2 ± 2.0 mmHg, p=0.97, EF 67.7± 14.7 vs 63.6 ± 8.7 %, p=0.42) No significant difference was revealed in postoperative BNP.

(Conclusions) With our strategy for Fontan candidates, good outcomes are achievable even in the group of patients with elevated pulmonary artery pressure and low cardiac output.

O28-8

MYOCARDIAL PROTECTION OF LANDIOLOL IN PATIENTS WITH TETRALOGY OF FALLOT

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OBJECTIVE: Landiolol (Onoact), an ultra short-acting β1-selective blocker, was continuously administered and its effects on the perioperative hemodynamic state were studied.

METHODS: This was a retrospective single center study. Twenty-two patients, who underwent complete repair of Tetralogy of Fallot from July 2007 to October 2012,were divided into 2 groups: 13 patients (group L), who received administration of Landiolol, were compared with the non-administration group of 9 patients (group C). Administration of Landiolol was started at 1μg/kg/min from anesthesia induction and discontinued 72 h after admission to PICU. Comparison between the 2 groups was made with regard to pre-, intra, and postoperative factors.

RESULTS: The preoperative features of age, body weight, and sex were not significantly different between the groups. There were no significant differences among the intraoperative factors of duration of aortic cross clamping, cardiopulmonary bypass, surgery, anesthesia, amount of bleeding or amount of catecholamine administered. Atrial tachyarrhythmia was observed in 2 cases in group C but in none in group L. Values of AST and CPK-MB, the cardiac enzymes released into the bloodstream as a consequence of cardiac injury, Values of AST upon admission to PICU (195±52 vs. 266±103 IU/l; $p<0.01$), at 24h (148±48 vs. 425±72 IU/l; $p<0.01$), at 48h (68±17 vs. 204±94 IU/l; $p=0.03$) and at 72h (44±12 vs. 273 ±187 IU/l: $p<0.01$) were significantly lower in grope L than those in group C. Similarly, values of CPK-MB at 72h were 25±9 IU/l and 206±196 IU/l in groups L and C ($P=0.04$), respectively.

CONCLUSIONS: The results demonstrated that by the continuous low-dose administration of Landiolol, atrial tachyarrythmia in the intra- and postoperative period was significantly suppressed. Moreover, the release of myocardial enzymes tended to be suppressed in-group L. Eventually, the myocardial protective effect of Landiolol, including the improvement of myocardial ischemia in the perioperative period, would be expected.

♥ O28-9

SURGICAL OUTCOMES OF CONGENITAL ESOPHAGEAL ATRESIA

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Objective: The postoperative complications and mortalities in congenital esophageal atresia have been still high. However, since these reports were based on data before 2000, recent operative outcomes needed to be reviewed. Herein authors reviewed 48 patients with congenital esophageal atresia to find out the postoperative results and complications.

Methods: A retrospective review was conducted on age, sex, body weight, associated anomalies, presence of preoperative aspiration pneumonia, postoperative complication and mortality of 48 cases of esophageal atresia in Pusan National University Hospital from February 2004 to December 2011.

Results: Of 48 patients (29 boys and 19 girls), the mean birth weight was 2.52 kg (range, 1.27 to 3.67 kg), and the mean interval between diagnosis and operation was 6.47 days (range, 1 to 81 days). 12 patients (25%) had preoperative aspiration pneumonia associated with esophageal atresia. 46 cases were type C esophageal atresia (95.8%) and 2 cases were type A (4.2%). Associated anomalies occurred in 41 infants (85.4%), including cardiac defects in 33 (80.4%). Primary repair could be performed in all patient, except one patient who had a long gap. Postoperative complications occurred in 29 patients, including anastomotic stricture (52.1%), anastomotic leakage (6.3%), pneumonia (4.2%), sepsis (4.2%), recurrent tracheoesophageal fistula (2.1%) and others (16.6%). Of 25 patients with anastomotic stricture, 23 cases were successfully resolved after balloon dilatation and 2 patients after reoperation. Although the overall survival was 97.9%, the death was not related with this operation. The causes of death were sepsis in one, heart failure due to major aortopulmonary collateral arteries in the other.

Conclusion: Comparing with previous articles, postoperative complications and mortality were decreased, except postoperative anastomotic stricture which could be overcome by intervention.

♥ : Travel Grant

O29-1

RIGHT VENTRICULAR PAPILLARY MUSCLE APPROXIMATION AS A CONCOMITANT PROCEDURE FOR EBSTEIN'S ANOMALY: ANALYSES OF THE TRICUSPID ANNULAR AND RIGHT VENTRICULAR DIMENSION BY THREE-DIMENSIONAL ECHOCARDIOGRAPHY

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OBJECTIVE: The Cone procedure for Ebstein's anomaly leads to fairly good outcomes, but it could be better by actively remodeling annulus and ventricle. We performed right ventricular-papillary muscle to septum approximation (RV-PMA) concomitant with Cone procedure for these patients and assessed its effects on annular and right ventricular (RV) dimension.

METHODS: From September 2009 to January 2012, 10 patients (9 Ebstein's anomaly and 1 Ebsteinoid dysplasia of tricuspid valve) who underwent RV-PMA concomitant with Cone-type repair, and 10 controls matched with the study patients by diagnoses, were retrospectively enrolled for this study by pre-op and post-op (at discharge) 3-dimensional echocardiographic (3DE) data availability. The grade of tricuspid regurgitation (TR, none 0 to severe 4), tricuspid valve annular dimension, and RV sphericity index (RVSI) were measured by 3DE and the % change of each parameter from pre-op to post-op was compared between the RV-PMA and control groups by Student's t test.

RESULTS: There were no deaths. TR grade improved in the both groups (RV-PMA, 3.9±0.3 to 1.7±0.8, -56±22%; Control, 3.6±0.7 to 1.8±0.6, -47±25%; p=0.39). As compared to the controls, the RV-PMA group patients further reduced the septal-lateral dimension of tricuspid annulus (RV-PMA, 35.3±11.3 to 22.7±4.3, -33±13%; Control, 27.7±15.3 to 19.7±4.1, -21±17%; p=0.11), the antero-posterior dimension of tricuspid annulus (RV-PMA, 40.8±17.3 to 21.4±4.6, -42±20%; Control, 26.8±13.4 to 18.8±7.3, -25±21%; p=0.09), the tricuspid annular area (RV-PMA, 13.5±8.2 to 4.7±1.6, -60±12%; Control, 8.0±9.9 to 3.7±2.1, -38±26%; p=0.02). In addition, RV-PMA also improved the systolic RVSI (RV-PMA, 0.65±0.05 to 0.53±0.13, -18±15%; Control, 0.63±0.17 to 0.59±0.19, 0±45%; p=0.27), and the diastolic RVSI (RV-PMA, 0.69±0.04 to 0.53±0.13, -24±12%; Control, 0.63±0.02 to 0.64±0.18, 1±27%; p=0.02).

CONCLUSIONS: RV-PMA adjunct to the Cone procedure improves the remodeling effects on tricuspid annulus and RV compared to Cone-type repair alone for Ebstein's anomaly. Longer follow-up period is required to assess continued improvement.

O29-2

TRICUSPID VALVE REPAIR FOR SEVERE EBSTEIN'S ANOMALY IN EARLY INFANCY

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Purposes:

Ebstein's anomaly is a rare congenital heart disease and consists of broad spectrum of severity. The optimal management remains controversy; and Starnes's operation as single ventricle palliation is highly advocated in severe form of Ebstein's anomaly, especially in early infancy. Reported series of tricuspid valve(TV) repair usually consisted of patients with relative stable hemodynamic and elder age. Here we describe the experience of tricuspid valve reconstruction in the early infancy, which provide chance of survival with bi-ventricle physiology.

Methods:

The principle of TV reconstruction consisted of detach the leaflet annulus from the abnormal position, mobilize the anterior and posterior leaflets from the right ventricle wall by "surgical delamination" and reattached to normal position of tricuspid annulus. The atrialized right ventricle was not plicated in this group of patients.

Results:

Since 2007, four infants received TV repair. All patients had severe cyanosis or heart failure and could not separate from mechanical ventilation. The mean age at operation was 1.5 months and body weight was about 3-4 kg. All had muscular and fibrous attachment of their TV anterior leaflets to right ventricular free wall, in addition to the down-ward displaced septal leaflets. Two patients were associated with ventricular septal defect, which were repaired in the same operation. One patient was associated with functional pulmonary atresia. All patients survived operation and successfully extubated. Two of them, 4 and 2 years after operation, had the complete separated bi-ventricle circulation and good functional status. The other two had fenestrated atrial septal defect and follow-up in the out-patient clinic.

Conclusion:

Reconstruction of TV is an acceptable surgical strategy even in severe neonatal Ebstein's anomaly with hemodynamic instability. The surgical delamination of the TV leaflets is possible in small infants and could restore the antegrade blood flow to pulmonary artery.

O29-3

NEONATE REPAIR OF EBSTEIN'S ANOMALY; MODIFICATION OF STARNES PROCEDURE IN THREE CASES

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Background

Ebstein's anomaly in the severely symptomatic neonate is usually fatal. Since the mortality for various surgical interventions has been prohibitively high, the surgical approach for neonates with critical condition is unclear.

Methods

We reviewed our results with univentricular repair of three consecutive severely symptomatic neonates (2.4 to 2.9 kg of weight) with Ebstein anomaly at our institution since 2007.

Results

Each had associated complex cardiac anomaly, including pulmonary stenosis with functional pulmonary atresia, or anatomic pulmonary atresia. Preoperatively, all infants had severe tricuspid regurgitation; Great Ormond Street Ebstein echocardiogram scores greater than 1.3:1 (grade 3 or 4). Cardiothoracic ratio greater than 0.85. All patients were severely cyanotic and needed mechanical ventilation. Hepatic and renal insufficiency with diffuse coagulopathy was preoperatively present in two patients. Surgical repair consisted of (1) closure of a competent monocuspid tricuspid valve, (2) fenestration of tricuspid valve, (3) atrial septal defect enlargement, (4) pulmonary banding or ligation, and (5) modified Blalock-Taussig shunt. After surgery, there was no early or late death. All patients are currently asymptomatic, and in sinus rhythm. At 5-year follow-up, two patients could be reached to the last stage of Fontan circulation. On the basis of these results and review of the current literature, we proper modified Starnes procedure in the neonate with Ebstein's anomaly.

Conclusions

The modification of Starnes procedure appropriated for each condition of Ebstein's anomaly in neonate provides excellent mid-term outcome.

♥ O29-4

DOES THE BIODEGRADABLE ANNULOPLASTY RING PROMOTE GROWTH POTENTIAL AND ANNULAR REMODERING IN PAEDIATRIC UNDERGOING MITRAL VALVE REPAIR ?

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Objective; Biodegradable Annuloplasty Ring was specially designed and developed for paediatric patients because of its availability of the size smaller than 26mm. The aim of this study is to review the results of mitral valve repair in patients with congenital mitral valve regurgitation and to analyze whether concomitant annuloplasty promotes annular remodeling and growth potential of the native annulus.

Method; Between January 2006 to December 2009, 42 patients in the Paediatric age group underwent Mitral Valve Repair using the Biodegradable Annuloplasty Ring. The mean age of the patient was 4.3 (Range: from 7days to 14 years old). Follow up complete in 27 patients (64%). The median follow up period was 50 months (Range: 23 to 75 month).

Results; The measured pre-operative diameter was 139% of the predicted which reduced to 96% of predicted on the latest follow-up. However there was no significant gradient showing evidence of mitral stenosis except in 2 patients. The annulus diameter increased by 11.6%.

Conclusion; Concomitant mitral valve annuloplasty using the biodegradable ring is feasible in patients with smaller annular size. Most patients did not develop mitral regurgitation requiring reoperation. Though some patient annulus size did reduce below the predicted size on follow-up there was no significant increase in the gradient. Besides promoting annular re-modeling, it promotes the growth potential of the mitral valve annulus in these groups of patients.

♥ : Travel Grant

O29-5

MITRAL VALVE REPAIR WITH ARTIFICIAL CHORDAE IN CHILDREN

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Objectives: Mitral valve repair with chordal replacement using expanded polytetrafluoroethylene (e-PTFE) in adult patients showed excellent long-term outcome. This study reviewed a single institution's experience about mitral valve repair with artificial chordae in children.

Methods: From 1995 to 2011, 78 patients (34 male and 44 female) underwent mitral valve repair with chordal reconstruction using artificial chordae. Median age and body weight at the repair were 1.5 years (range, 3.6 months to 13.4 years) and 9.1 kg (2.5-31.4), respectively. The mean follow-up time was 8.3 years. Results: There was one in-hospital death and no late death. All but 2 patients underwent simultaneous mitral annuloplasty. At the time of mitral valve repair, 8 (10%) patients was performed unsuccessfully with artificial chordae and converted to other techniques including mitral valve replacement. Six patients needed mitral valve reoperation at the median interval as 8 months (range, 17 days to 5 years). Freedom from mitral valve reoperation was 92.5% and 90.4% at 5 and 10 years, respectively. At the latest follow-up, more than moderate mitral valve regurgitation was seen in 3 patients. Risks for the composite outcome were low body weight at the operation and Carpentier classification type 3.

Conclusions: Mitral valve repair with artificial chordae in infants and children is safe and associated with a low reoperation rate. Further investigation into the long-term durability and biological adaptation of ePTFE sutures after somatic growth is mandatory.

O29-6

THE IMPACT OF BIDIRECTIONAL CAVOPULMONARY SHUNT ON THE ATRIOVENTRICULAR VALVE ANNULUS AND REGURGITATION IN THE PATIENTS WITH FUNCTIONAL SINGLE VENTRICLE

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Objective: The objective of this study was to evaluate the influence of volume unloading by bilateral cavopulmonary shunt (BCPS) on the atrioventricular (AV) valve in the patients with functional single ventricle.

Methods: Thirty seven consecutive functional single ventricle patients, operated between 2008 and 2012, who survived after BCPS, were enrolled in this study. The echocardiograms were reevaluated for AV valve regurgitation and the size of the AV valve annulus before and after BCPS. The size of the AV valve annulus was standardized to the body surface area of the patient at the time of the echocardiography. The grade of regurgitation was scored as 1 (none), 2 (mild regurgitation), 3 (moderate regurgitation), and 4 (severe regurgitation).

Results: The AV valve (common AV valve 21, tricuspid valve 6, mitral valve 8) regurgitation before BCPS was none in 12 patients, mild in 11 patients, moderate in 11 patients and severe in 3 patients. The mean regurgitation score was 2.1. Concomitant AV valvuloplasty was performed in 8 patient. The mean z value of postoperative AV valve annulus of those who underwent valvuloplasty was significantly lower than preoperative value (-0.25 vs 3.91, $p<0.01$). The mean regurgitation score also decreased significantly after BCPS in comparison to the preoperative score (2.25 vs 3.37, $p=0.031$). In the remaining patients without valvuloplasty, the mean z value of postoperative AV valve annulus was also significantly lower than preoperative value (0.45 vs 1.51, $p=0.021$). However, there was no significant change in the mean regurgitation score after BCPS compared to the preoperative score (1.60 vs 1.78, $p=0.48$).

Conclusions: The size of the AV valve annulus in functional single ventricle patients decreases after BCPS, most likely due to volume unloading of the systemic ventricle. However, this remodeling of the ventricle does not improve the degree of AV valve regurgitation.

O29-7

CLINICAL OUTCOMES OF TOTAL ANOMALOUS PULMONARY VENOUS CONNECTION WITH SEVERE PULMONARY VENOUS OBSTRUCTION

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OBJECTIVE: If significant obstruction is presented on pulmonary venous draining pathway, patients with total anomalous pulmonary venous connection (TAPVC) show severe hypoxia and subsequent cardiogenic shock immediately after birth, thus emergent surgery is the only way to rescue. We reviewed our clinical outcomes of patients with TAPVC with severely obstructed or completely occluded pulmonary venous drainage pathway. METHODS: Between 1999 and 2011, 12 consecutive patients (8 males, 2.9±0.3 kg) underwent TAPVC repair within 24 hours after birth for their severe hypoxemia and metabolic acidosis under mechanical ventilation support. Patients with functionally single ventricle were excluded. Two patients had common pulmonary venous atresia. Darling classification was type I in 6 patients, II in 1, III in 4, and IV in 1. Mean follow-up period was 5.2±3.4 years (range, 0.2-11.2 years). RESULTS: Both of 2 patients with common pulmonary venous atresia died due to pulmonary hypertension crisis, while the remaining 10 patients survived. The mean nitric oxide inhalation and intubation periods after surgery were 11.3±8.4 days (3-27 days) and 33.3±41.7 days (4-105 days), respectively. Five of 10 survivors (50%) developed postoperative pulmonary venous stenosis (PVS). pulmonary arterial pressure and pulmonary vascular resistance in patients without postoperative PVS were normalized within 1 year after surgery, while those in patients with postoperative PVS were also normalized long after relief of PVS by sutureless technique. CONCLUSIONS: Clinical outcomes of patients with TAPVC and severely obstructed pulmonary venous drainage pathway requiring surgery soon after birth were acceptable. The prognosis of those with common pulmonary venous atresia was poor. Although postoperative pulmonary venous stenosis was common, pulmonary arterial pressure and pulmonary vascular resistance could normalize long after successful surgical relief by sutureless technique.

O29-8

SURGICAL MANAGEMENT OF TOTAL ANOMALOUS PULMONARY VENOUS CONNECTION TO THE SUPERIOR VENA CAVA EARLY RESULTS

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OBJECTIVE

Total anomalous pulmonary venous connection (TAPVC) to Superior Vena Cava (SVC) is a rarest subset of Supracardiac type of TAPVC. Absence of common chamber makes the surgical management even more challenging. We present our experience of managing this subset using modified two patch and Warden's techniques and early postoperative results.

PATIENT & METHOD

Between June 2011 and October 2012, 3 patients with TAPVC to the SVC without common chamber were operated at our institute. After delineating the anatomy, one of them had a modified two patch repair and other two were managed with the Warden's technique.

RESULT

There was no in-hospital mortality or early mortality over a mean follow-up of 11 months (range 7 to 14 months). All the patients on follow-up had unobstructed pulmonary venous and SVC drainage on echocardiography. None of the patient in our group had any rhythm disturbances. All patients remained in sinus rhythm on follow-up.

CONCLUSION

It is paramount important to delineate anatomical details using Echocardiography and Computer tomography angiography and to have an individualized approach. Surgical plan in this subset depends on the age of patient and the anatomy of the lesion. This subset of patient can be repaired with excellent immediate and early results using modified two patch or Wardens technique. However these patients must be closely followed up for complication like systemic and pulmonary venous obstruction.

O30-1

ANTERIOR PULMONARY ARTERY TRANSLOCATION FOR AIRWAY OR PULMONARY ARTERY COMPRESSION WITHIN THE AORTOPULMONARY SPACE

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OBJECTIVE:
Children with congenital heart disease often experience airway obstruction and pulmonary artery stenosis within the aortopulmonary space. This report describes our experience with the anterior pulmonary artery translocation procedure for these problematic patients.
METHODS:
Sixteen children with congenital heart disease underwent anterior pulmonary artery translocation for relieving airway and/or pulmonary artery compression within the aortopulmonary space between 2008 and 2012. The patients who underwent arterial switch procedure for transposition of the great arteries were excluded. Previous operations had been performed in 8 patients (Norwood, 2; Yasui, 2; extended end-to-end anastomosis, 1; slide tracheoplasty, 1; pulmonary artery banding, 2). Eight patients had been intubated preoperatively, and 2 patients with tracheal stenosis had undergone tracheostomy. The median age at the pulmonary translocation procedure was 4 months (5 days - 36 months), and median weight was 5.0 kg (2.4 - 10.9 kg). For pulmonary translocation procedure, the aorta was transected in 6 patients, whereas the right pulmonary artery was transected in 10 patients. Right ventricle-pulmonary artery continuity was established with valved conduit in 4 patients (bilateral valved conduit, 3). In three patients with absent pulmonary valve syndrome, reduction pulmonary arterioplasty was performed.
RESULTS:
The median follow-up time was 19 months. There were no early death and one late death (encephalopathy). All patients had evidence of decreased airway compression on subsequent bronchoscopy or computed tomography. Nine patients were successfully extubated and had no respiratory symptom at latest follow-up. Although 3 patients with distal bronchomalacia subsequently needed tracheostomy, their airway symptom had improved with time. One patient underwent balloon aortoplasty for residual right pulmonary artery stenosis.
CONCLUSIONS:
Anterior pulmonary artery translocation is an effective option for airway or pulmonary artery compression within the aortopulmonary space. It could be performed as a component of various types of congenital heart procedures.

O30-2

IMPACT OF TYPE OF OPERATION, AGE AT REPAIR, AND POSTOPERATIVE PULMONARY REGURGITATION ON VENTRICULAR ARRHYTHMIA LATE AFTER FALLOT REPAIR (MORE THAN 20 YEARS)

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Objective: The purpose of this study is to evaluate the impact of type of repair, age at operation, and postoperative pulmonary valve regurgitation on ventricular arrhythmia late after Fallot repair (more than 20 years).

Method: Since July 1964, 387 patients had undergone definitive repair of tetralogy of Fallot in our institute. Of those, 60 patients who was followed for up to 20 years were retrospectively reviewed. Mean follow-up period was 30.6 +/- 75 years. Type of repair was trans-right ventriculotomy approach (RV group) in 19 cases and transanular patch technique (TAP group) in 31.

Results: Age at Fallot repair was 5.2±4.0 years old in RV group and 6.6±5.6 years old in TAP group. During follow-up, ventricular tachycardia or fibrillation was recognized in 10 patients (RV group in 1, TAP group in 9), ICD implantation was performed in 6 patients (1 in RV group, 5 in TAP group). On the latest post-operative echocardiography, significant pulmonary valve regurgitation (PR) was more frequent in TAP group (RV group in 3, TAP group 15; p=0.028). Brain natriuretic peptide (BNP) value was higher in TAP group (25.0±17.0 pg/ml in RV group, 86.3+/-87.4 pg/ml in TAP group; p=0.048).

In patients with ventricular arrhythmia, age at repair was higher than those with no arrhythmia (9.7+/-9.3 vs 5.3+/-3.3 years old). On the latest echocardiography, pressure gradient of the tricuspid regurgitation was higher (40.5+/-10.9 vs 30.9+/-9.9 mmHg, p=0.016) and recent BNP value was also higher (126+/-111 vs 49+/-56 pg/ml, p=0.021) in patients with ventricular arrhythmia.

Conclusion: Incidence of ventricular arrhythmia and pulmonary insufficiency late after Fallot repair were significantly lower in RV group than TAP group. Older age at repair, longer follow-up period, higher BNP value, and higher pressure gradient at tricuspid valve regurgitation are risk factor of ventricular arrhythmia.

♥ O30-3

PULMONARY VALVE-SPARING STRATEGY IN THE REPAIR OF RIGHT VENTRICULAR OUTFLOW TRACT OBSTRUCTION IN TETRALOGY OF FALLOT: EARLY, INTERMEDIATE AND LONG-TERM OUTCOMES

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Objectives. The preservation of the pulmonary annulus during total correction of Tetralogy of Fallot (TOF) remains to be a controversial issue. This retrospective cohort aims to determine the early, intermediate and long-term outcomes of patients who underwent a pulmonary valve-sparing strategy of TOF repair in the Philippine General Hospital (PGH), and to compare them with outcomes of patients who underwent a liberal approach using transannular patching.

Methods. Between 2001 and 2011, 73 patients underwent TOF repair. Of these, 55 patients were subjected to a pulmonary valve-sparing (PVS) technique, while 18 underwent transannular patching (TAP). A retrospective review of the clinical outcomes in the immediate postoperative period was conducted, and two-dimensional transthoracic echocardiographic data in the early, intermediate and late postoperative periods were analyzed.

Results. No significant difference was noted in the baseline characteristics of patients, including pulmonary valve z-scores (p-value 0.234). With regard to short-term outcomes, patients who underwent a PVS technique were comparable with patients who underwent TAP in terms of conduction abnormalities (27% vs 33%, p-value 0.765), re-intervention rates (early 12.7% vs 27.8%, p-value 0.155; late 5.5% vs 5.6%, p-value 1.000), and morbidities (29.1% vs 38.9%, p-value 0.560). There were 4 deaths (5%) in the series. With regard to medium- and long-term outcomes, there was a significant decrease in residual obstruction through time in the PVS group (p-value 0.000). Pulmonary regurgitation was slightly higher in TAP patients in the early postoperative period; however, they approximate each other during the intermediate and late periods.

Conclusion. A pulmonary valve-sparing technique of TOF repair can be accomplished with similarly acceptable outcomes as the conventional transannular patching technique, even in patients with high z-scores. The PVS technique is associated with a progressive decrease in residual stenosis through time. The incidence of clinically significant pulmonary insufficiency is similar, whichever technique is utilized.

♥ : Travel Grant

O30-4

SYSTEMIC-MAIN PULMONARY ARTERY SHUNT AND RIGHT VENTRICLE TO PULMONARY ARTERY CONNECTION: WHICH CAN BENEFIT PULMONARY ATRESIA WITH DIMINUTIVE PULMONARY ARTERIES AND MAJOR AORTOPULMONARY COLLATERAL ARTERIES

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OBJECTIVE: The central shunt and RVPA connection were done to pursue the goal of growing the diminutive native pulmonary arteries via establishment of central pulmonary blood flow. Logically, the central shunt can provide more pressure to oppose the blood flow from large collaterals, we assume it can promote closure of collaterals, and few pulmonary effusion because of competed blood flow of collaterals. The study aimed to determine whether the central shunt can provide more benefits for pulmonary atresia with diminutive pulmonary arteries and major aortopulmonary collaterals.

METHODS: From January 2009 to November 2012, 47 patients were treated with RVPA connection , 6 had aortopulmonary collaterals. Nakata index was 114mm2/m2 (79-167). And from October 2010 to November 2012, 14 consecutive patients were performed by author with ascending aorta to main pulmonary artery shunt. All had major collaterals from 2 to 4.The central shunt was constructed using a 5mm Gore-Tex conduit and completed with off-pump in all patients. Nakata index was 43 mm2/m2 (3-134).

RESULTS: There were no death in both groups. The mechanical ventilation time was 57.3±39.6h in RVPA connection group and 42.6±33.5h in central shunt group ($p<0.05$). 3 had severe pulmonary effusion in RVPA group. 6 patients without collaterals In RVPA group had a complete repair with Nakata index of 211mm2/m2 (175-267),but all patients with collaterals had no chance to receive complete repair because of no growing of native pulmonary artery and existing major collaterals. In shunt group 4 patients had a complete repair with Nakata index of 237mm2/m2 (189-272), and all collaterals closed before operation.

CONCLUSIONS: The ascending aorta to main pulmonary artery shunt approach (1) provides a high survival rate with shorter mechanical ventilation time,(2) promotes the closure of major collaterals and growing of diminutive native main pulmonary artery, avoids the use of autologus material or prosthetic graft.

O30-5

THE OPTIMAL GRAFT SIZE OF BLALOCK-TAUSSIG SHUNT IN NEONATES AND SMALL INFANTS

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<OBJECTIVE> The Blalock-Taussig shunt(BTS) is one of the most important palliative procedures in congenital heart surgery. However, in neonates and small infants, operative mortality and morbidity due to excessive pulmonary blood flow or shunt failure is still high. In this study, the effectiveness of small shunt graft (3.0mm in diameter) was estimated to reveal the optimal shunt graft size of in the BTS.

<METHODS> Twenty two patients excluded single ventricle physiology who underwent a BTS were reviewed. We divided the study cohort into two groups. Group A (n=9) included patients with shunt graft sized 3.0 mm in diameter, whereas Group B (n=13) included patients with shunt graft sized 3.5 mm in diameter. The mean age and body weight were 46days and 3.3kg, and there were no differences between two groups. The BTS was performed via median sternotomy, and 5 patients underwent under cardiopulmonary bypass. Postoperative courses, and short- and mid-term results were assessed between the groups.

<RESULTS> There was no hospital death and no shunt failure in both groups. There were 2 cardiogenic shock due to the excessive pulmonary blood flow (15.4%) in Group B. There were no differences in postoperative arterial oxygen saturation between two groups. The maximum catecholamine index in Group B was significantly greater than that in Group A(GroupA: 4.4±1.0 vs Group B: 7.0±4.2,p=0.05). There were no differences in body weight at complete repair between two groups. During follow-up periods, body weight gain in Group A was significantly greater than that in Group B(GroupA: 17.9±6.5 vs Group B: 11.5±4.7 gram/day, p=0.01), resulting that the age at complete repair in Group A was significantly younger than that in Group B(GroupA:173±44 vs Group B:300±116 days, p=0.004).

<CONCLUSIONS> The small shunt graft (3.0 mm in diameter) in BTS is safe and effective, providing an adequate pulmonary blood flow for neonates and small infants.

O30-6

STRATEGY OF SYSTEMIC-TO-PULMONARY ARTERY SHUNT WITH PULMONARY ARTERIAL RECONSTRUCTION FOR PULMONARY COARCTATION IN NEONATE AND EARLY INFANCY

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Objective:
Pulmonary atresia with pulmonary coarctation may lead to unbalanced pulmonary artery growth.The aim of this study is to assess our strategy of systemic-to-pulmonary artery shunt with pulmonary arterial reconstruction in neonate and early infancy for sufficient and balanced pulmonary artery growth.
Methods:
Our strayegy is to reconstruct central pulmonary artery for the patients with pulmonary coarctation during neonate or early infancy using cardiopulmonary bypass instead of bilateral B-T shunt.
We perfomed a retrospective review of 13 patients with pulmonary atresia or pulmonary coarctation who underwent systemic-to-pulmonary artery shunt with pulmonary arterial reconstruction by median sternotomy. The mean age and weight were 40 days and 2.8kg, respectively. The patient population included 6 Fontan candidates and 7 biventricular repair candidates.To assess our strategy, bilateral pulmonary artery growth and morphology were evaluated.
Results:
No early or in-hospital deaths occurred. Reconstructed central pulmonary artery maintained the confluency and there was no segmental mal-development at the time of postoperative catheterization. The mean minimum diameter of the pulmonary artery incleased significantly from 3.4mm to 4.1mm. In Fontan track cases, 4 of 6 completed the Fontan procedure.
5 biventricular repair candidates completed definitive repair, and 1 required reoperation of systemic-to-pulmonary artery shunt, and 4 required catheter intervention.Patients who have less than 3 kg body weight and small diameter of pulmonary artery tend to require catheter interventions.
Conclusions:
Systemic-to-pulmonary artery shunt with pulmonary arterial reconstruction by median sternotomy provides sufficient and balanced pulmonary arterial growth for pulmonary atresia and pulmonary coarctation.

O31-1

SURGICAL MANAGEMENT OF PULMONARY ARTERY SLING

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Abstract

Objectives

Pulmonary artery sling is frequently associated with tracheal and/or bronchial stenosis. A number of patients receive only re-implantation or relocation of the left pulmonary artery while other patients may require tracheoplasty for stenosis of the airway. We study the clinical outcomes with or without tracheoplasty.

Methods

A total of 20 patients with PA sling who received surgery in our institute was included in this study. We reviewed the clinical outcomes and the severity of trachea stenosis, and evaluated various surgical strategies.

Results

Among the 20 patients, all patients received left pulmonary artery(LPA) re-implantation, and tracheoplasty were performed in 12 (60%) of them. For the 12 patients that received LPA reimplantation and tracheoplasty, 9 received slide tracheoplasty and 8 of them survived, one patient died of cytomegalovirus infection despite patent airway. Two patients had pericardial patch augmentation and both died. One patient received a resection and end-to-end anastomosis and survived. The patients without tracheoplasty all survived, but the trachea diameter remain stenotic in the follow-up period.

Conclusions

In this study cohort, approximately 60 % of the patients with PA sling received tracheoplasty. Slide tracheoplasty provided acceptable good results for patients with PA sling and tracheal stenosis.

♥ O31-2

TREATMENT STRATEGIES FOR TETRALOGY OF FALLOT WITH UNILATERAL ABSENT PULMONARY ARTERY

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Objective: A rare subgroup of patients with Tetralogy of Fallot includes unilateral absence of pulmonary artery. Literature lacks an accepted strategy for the treatment of the pathology. Moreover available options carry considearble mortality and morbidity.

Methods: Among 213 patients with the diagnosis of Tetralogy of Fallot admitted to our institution between July 2010 and July 2012, there were 8 patients who had single pulmonary artery. Six patients were male 2 were female. Ages range was 7 months to 8 years. Mean body mass index was 15,7±7,4 kg/m2. Pulmonary artery Nakata index, Nakata index Z-score and McGoon index were used for the assessment of the pulmonary arteries and surgical strategy.

Results: Two patients were in critical situation. They underwent urgent modified Blalock-Taussig shunt operations. Three patients with low pulmonary artery indices received right ventricular outflow tract reconstructions without closure of the VSD. One patient with borderline pulmonary artery underwent shunt procedure; however, postoperative course was complicated with overflow and underwent total correction with a check-valved VSD patch. This patient required extracorporeal membrane oxygenator support in the postoperative period. Remaining patients underwent total correction, uneventfully. Mortality did not occur. Mean durations of hospital stay and follow up were 12±10,9 days and 172,4±75,8 days, respectively.

Conclusion: The series indicates the feasibility of surgical correction in patients with appropriate unilateral pulmonary artery size and palliative procedures when the pulmonary artery size is smaller than predicted for the age in this challenging group of patient with Tetralogy of Fallot.

♥ : Travel Grant

O31-3

BI-VENTRICULAR REPAIR OF TETRALOGY OF FALLOT ASSOCIATED WITH COMPLETE ATRIOVENTRICULAR SEPTAL DEFECT

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OBJECTIVE:To review our experience with Bi-ventricular repair of Tetralogy of Fallot associated with complete atrioventricular septal defect, using a two-patch technique in closure of septal defect.

METHODS: Between 2004 and 2011, 18 children with tetralogy of Fallot and complete atrioventricular septal defect were admitted; 2 had Down's syndrome (11%). Bi-ventricular repair was performed in all patients at a median age of 9 months (range, 4 months to 12 years)The two-patch technique for atrioventricular septal defect was used. The ventricular septal defect was closed through a right atriotomy in 50% cases; the other by a right ventriculotomy. The commissure between the superior and inferior bridging leaflets of the left portion of the common atrioventricular valve was closed in each patient. RVOT obstruction was relieved by a transannular autologous pericardium patch in fifteen patients (83%), including with monocusp valve in one case, and by infundibular patch with preservation of the pulmonary valve in 3 (17%).

RESULTS: Overall in-hospital survival was 95%. Among patients with CAVSD-TOF, one died in hospital (5%); causes of death were heart block, progressive heart failure and multiple organ failure. Median follow-up was 3.7 years (range 6 months-5 years).There was no late mortality and 4 patients had mild-moderate left atrioventricular valve regurgitation, 2 patients with moderate TR. Marked PI with higher RVEDV was in 25% survival. RVOT was 83% of freedom from reinterventions.

CONCLUSIONS: Bi-ventricular repairwith two-patch technique closuring septal defect in patients with Tetralogy of Fallot associated with complete atrioventricular septal defect seem to offer favorable intermediate survival. The RVOTO should be relieved in the same fashion as for isolated TOF. Long-term follow-up is necessary for AV valve dysfunction and pulmonary insufficiency.

♥ O31-4

WHAT WE CAN LEARN FROM TOTAL CORRECTION OF TETRALOGY OF FALLOT WITHOUT TRANSANNULAR PATCH

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OBJECTIVE: Total correction of tetralogy of Fallot (TOF) without transannular patch (TAP) seems promising to prevent pulmonary regurgitation that lately considered as a harmful complication following conventional repair of TOF using TAP. But reintervention sometimes needed as residual right ventricular outflow tract obstruction still noticed and perioperative outcome are variable. The aim of this study was to analyze the feasibility and perioperative outcome of total correction of TOF without TAP.

METHODS: A retrospective study of all TOF cases repaired in our institute between June 2009 and April 2012 was conducted. Perioperative outcome of cases that had TOF repair without TAP (group I) were compared to the conventional repair of TOF using TAP cases (group II).

RESULTS: There were 357 patients fulfilled the study criteria. Age ranged from 2 months to 31 years (median, 3 years). There were 94 cases (26.3%) in group I and 263 cases (73.7%) in group II. We observed no difference in the ICU length of stay, mechanical ventilation time in ICU, residual VSD, RV-PA pressure gradient, and tricuspid regurgitation between all groups. However, CPB time (59 minutes versus 84 minutes, $p<0.01$) and post-repair pulmonary regurgitation were better in patients without TAP. Reoperation was performed in 3 patients from group I due to residual pulmonary stenosis, and TAP was eventually applied in these patients. The operative mortality was 2.5%.

CONCLUSION: Total correction of TOF without TAP can be safely performed in selected patients with good early results. Longer observations are needed to evaluate the exact role of this strategy.

♥ : Travel Grant

♥ O31-5

TETRALOGY OF FALLOT: TRANSATRIAL- TRANSPULMONARY REPAIR

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Objective: There is ongoing controversy in the treatment of tetralogy of fallot (TOF). The present study indicates the pathology may be corrected and excellent anatomical and hemodynamic results can be obtained with low mortality.

Methods: Between January 1999 and September 2012, 433 patients with the diagnosis of TOF underwent complete repair using transatrial / transpulmonary approach. Mean age was 29.7 ± 17.85 months (ranging from four months to 36 years). Weight of the patients were between 5-62 kg (mean: 10.28 ± 3.49). Patients were diagnosed with echocardiography. Cardiac catheterization was performed in 107 and computerized tomography was used in 54 patients. Among the patients 76 patients had previous palliative shunt operations. 34 patients had anomalous origin or course of a major coronary artery.

Results: A limited (< 1 cm) transannular incision was performed in 290 patients whereas in 120 patients had extended transannular incision (confined to the infundibulum) to obtain a sufficient RVOT diameter. Hospital mortality was 2.4% (10 patients). One patient was reoperated due to endocarditis at the postoperative eighth month. Mean ventilation time and intensive care unit stay were 42.2 ± 56.6 hours and 2.9 ± 2.7 days, respectively. Intraoperative mean RV/LV pressure ratio was 0.57 ± 0.41 and residual RV to PA mean pressure gradient was 14.5 ± 14 mmHg. During the mid-term follow up, 98% of the patients were in NYHA Class 1 and 85% had trivial pulmonary regurgitation.

Conclusion: The repair of TOF still remains a challenge. The The current 13-year experience confirms that TOF can be treated with low mortality and morbidity with excellent asymptomatic long-term survival; however, still there is not an accepted standardized surgical technique, i.e. transatrial or transpulmonary approach with or without transannular patch.

♥ : Travel Grant

O31-6

MID-TERM RESULT OF RIGHT ATRIAL ISOLATION FOR ATRIAL FIBRILLATION OR FLUTTER IN ADULT CONGENITAL HEART DISEASE

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Object: The right atrial isolation procedure was developed by Cox's group at 1988. The method was simple and easy to use for an additional procedure. Some reports presented unfavorable results of right-sided maze procedure for atrial fibrillation with atrail septal defect (ASD). But some presented favorable results of right atrial isolation. In this paper, we present our experience of right atrial isolation and the mid-term result with adult congenital heart disease.

Materials and Methods: Since 1998, 12 patients (5 men, 7 women) underwent right atrial isolation as a concomitant operation. Documented atrial arrhythmias included paroxysmal atrial fibrillation or flutter (n=9) and chronic atrial fibrillation (n=3). Associated cardiac defect included ASD (n=9), ASD with persistent ductus arteriosus (n=1) with pulmonary stenosis (n=1) and two chamber of right ventricle (n=1). Diagnoses were based on clinical evaluation and echocardiography. All patients had severe right atrial enlargement revealed on preoperative echocardiography. The procedure included right atriotomy and cryoablation at the level of tricuspid valve annulus. Ages at operation ranged from 25 to 70 years (mean, 52 years).The mean follow-up period was 6.5 years (range, 1 to 15 years).

Results: All but one was free from atrial fibrillation or flutter without medication. One patient underwent a pacemaker implantation with complete atrioventricular block.

Conclusion: Right atrial isolation is a simple and effective procedure that abolishes atrial fibrillation or flutter in adult congenital heart disease.

♥ O32-1

PERIOPERATIVE RISK ASSESSMENT IN CARDIAC SURGERY: COMPARISON OF SEVEN SCORING SYSTEMS IN CHINESE PATIENT POPULATION

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Objective: Correct evaluation of perioperative risk is essential for optimal resource utilization and to improve postoperative outcome. In the present study 7 different risk scoring systems were compared for their validity of risk assessment in an adult Chinese patient population undergoing cardiac surgery.

Methods: Between January 1, 2005 and October 17, 2012, 609 adult patients underwent cardiac surgery at our department were preoperatively scored by using the Cleveland Clinic, EuroSCORE II, French, Ontario Province Risk (OPR), Pons, Quality Measurement and Management Initiative (QMMI), and SinoSCORE (Sino system for coronary operative risk evaluation). All patients were followed up and 30-day mortality was registered. Hosmer-Lemeshow (HL) test was performed to assess calibration of the scoring systems. Validity of different scoring systems was evaluated by calculating the area under the curve (AUC) of receiver operating characteristics (ROC).

Results: Follow-up was completed in 594 patients, and the follow-up rate was 97.5%. The observed 30-day mortality was 5.22% (31/594 patients). The predicted mortality was 2.33% as assessed by Cleveland Clinic, 3.12% by EuroSCORE II, 7.27% by French, 1.62% by Ontario Province Risk (OPR), 5.11% by Pons, 5.91% by QMMI, and 2.77% by SinoSCORE. EuroSCORE II showed the best predictive value for mortality according to ROC analysis (AUC=0.727, 95% confident interval 0.629-0.825, P=0.000). All scoring systems were found to be well calibrated with a Hosmer-Lemeshow Chi-square test.

Conclusions: Among the 7 scoring systems, EuroSCORE II demonstrated the best predictive value for perioperative risk assessment in cardiac surgery in a Chinese patient population. Further studies in larger patient population are desirable to confirm these results.

♥ : Travel Grant

O32-2

MICROVASCULAR DYSFUNCTION LINKED TO CPB: WHY EARLY GUIDED THERAPY BASED ON NIRS WILL HELP LOWERING THE PERIOPERATIVE SHOCK

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INTRODUCTION

Monitoring must be foolproof and easy to understand . Firstly, assessed parameters must imply the opportunity of an intervention by the physician. Monitoring is the key in the CHD surgery as far as we keep on fighting for lowering morbidity.

Microcirculation dysfunction induced by cardiopulmonary bypass (CPB) lead to a complex shock starting six hours postoperatively. Clinical signs or lab test are trustworthy but delayed. Catheterization and echocardiography may not be usable. The aim of this study was to investigate wether or not a new insight provided by the NIRS (Near Infra Red Spectroscopy a non invasive bedside tool) would help the clinician to optimize the perfusion status .

METHODS

Our prospective descriptive study of muscular oximetry assessed by the rSO2 index (Somanetics Corp., Troy, MI) was driven during 90 cardiothoracic surgeries with CPB in children .We sampled blood Lactate level 6 hours after CPB (since it can predict the postoperative morbimortality).

Payen showed a poor correlation between NIRS (dynamic test) and lactate blood level during shock. We took advantage from his results and we tuned up his method.

The NIRS sensor was placed onto a muscle under the cuff pressure (IntelliVue X2, Philips Healthcare).This type of blood pressure device inflate the cuff above systolic blood pressure and deflates it in ten steps of 8 mmHg. Thus cuff deflation takes ten seconds. It produce an arterial tourniquet first , then a venous one.

RESULTS

The NIRS variation curve has two parts. Firstly it decreases during muscle compression related to oxygen delivery interruption. Secondly it increases: this is the reperfusion. Both can easily detects unstable cardiovascular conditions before the shock (they are correlated with postoperative lactates : $p<0.0001$*)

CONCLUSION

rSO2 can help optimizing CPB , inotropism, afterload , volume and oxygen delivery in order to prevent bad outcomes

♥ O32-3

MIXED VENOUS OXYGEN SATURATION TO PREDICT POSTOPERATIVE RISKS IN CARDIAC SURGERY: A RETROSPECTIVE COHORT ANALYSIS

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Objectives: Mixed venous oxygen saturation (SvO_2) is often used in cardiac surgery patients to evaluate the balance between oxygen delivery and oxygen consumption. The aim of this study was to evaluate SvO_2 as a prognostic marker for short-term outcome in an unselected cardiac surgery cohort.

Methods: Two hundred sixty two adult patients underwent different cardiac surgeries received trans-thoracic pulmonary artery catheter (TPAC) intra-operatively. Preoperative risk factors, types of operations, SvO_2 on admission to intensive care unit (ICU), postoperative complications and 30-day all-cause mortality were registered in all patients. The predictive value of SvO_2 with regard to 30-day all-cause mortality was analyzed by using receiver operating characteristics (ROC) analysis. The patients were then divided into two groups: group A with SvO_2 >=the predictive value and group B with SvO_2 < the predictive value. The two groups were then compared with each other with regards to postoperative complications.

Results: Lower SvO_2 on admission to ICU was associated with higher 30-day all-cause mortality. The area under the curve (AUC) was 0.795 (95% Confident Interval 0.653-0.936) for 30-day all-cause mortality (p=0.01). The best cutoff was 56.9% with a sensitivity of 0.667 and a specificity of 0.900. Thirty-day all-cause mortality was 1.7 % (4/229 patients) in group A and 24.2% (8/33 patients) in group B (p=0.000). The incidence of reoperation for bleeding/tamponad, lung infection, postoperative stroke, intra-aortic balloon pump support, mechanical ventilation time and colloid consumption in the first postoperative day were significantly higher in group B. Four patients (1.53%) had premature ventricular contraction postoperatively which disappeared soon after TPAC was removed. No TPAC-related bleeding was observed after removal of TPAC.

Conclusion: SvO_2 on admission to ICU demonstrated an acceptable sensitivity and excellent specificity for postoperative complications and 30-day all-cause mortality.

♥ : Travel Grant

♥ O32-4

TRANSCATHETER CLOSURE OF A TRAUMATIC VENTRICULAR SEPTAL DEFECT USING AN AMPLATZER (TM) ATRIAL SEPTAL OCCLUDER DEVICE: A CASE REPORT

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Penetrating chest trauma especially involving the heart is a serious injury. Hemodynamic instability warrants an emergent though high risk surgical procedure with the aim of correcting cardiac lacerations. A relatively rare occurrence, the incidence of ventricular septal defect (VSD) complicating penetrating cardiac trauma has been reported at 4.5%. Closing such VSDs during emergent surgery (especially if an off-pump approach is adopted) may not be possible. Such residual VSDs may become hemodynamically significant and thus may require closure in the immediate post-operative period in the face of persistent ventilator or inotrophic requirement attributed to heart failure. In a stable patient however, closure is performed if there is evidence of significant left to right shunt (Qp:Qs > 1.5) and/or left heart dilation with failure. Transcatheter closure of such VSDs is a good alternative to surgery and prevents issues related to cardiopulmonary bypass. Specialized VSD occluder devices ranging from 4mm to 24 mm are used for this procedure. Atrial septal defect (ASD) occluder can be utilized if the defect is larger than 24 mm or in case of unavailability of larger VSD occluder. We describe such a case of a post-traumatic VSD which was closed using an ASD occluder.

♥ : Travel Grant

O32-5

ANALYSIS OF RISK FACTORS FOR DEVELOPMENT OF CORONARY ARTERY EVENT AFTER ABDOMINAL AORTIC ANEURYSM REPAIR

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(OBJECTIVE) Abdominal aortic aneurysm (AAA) is predominantly atherosclerotic disease and patients with AAA may carry increased risk for coronary artery event after AAA repair. To improve the prognosis of patients undergoing AAA repair, we investigated risk factors for coronary artery event after AAA repair.

(METHODS) We retrospectively reviewed 363 patients who underwent elective AAA repair in our hospital between January 2001 and October 2011 (male 296, age 79±8 years). 275 patients underwent open repair and 88 underwent endovascular repair. 46 patients had a history of PCI and 16 of CABG prior to AAA repair. All patients underwent coronary angiography or adenosine-stress myocardial perfusion scintigraphy preoperatively, and 46 patients underwent PCI and 8 underwent CABG during perioperative period. Coronary artery event was defined as myocardial infarction, new onset of angina, congestive heart failure, PCI, CABG, or progression of coronary artery lesion. Cumulative risk of coronary artery event was obtained by Kaplan-Meier method, and risk factors were analyzed by multivariate Cox's proportional hazard model.

(RESULTS) The follow-up period was 0-12.5 (3.5±3.1) years. There were 2 in-hospital deaths and 44 late deaths during the follow-up period. Coronary artery event occurred in 35 patients (PCI 18, congestive heart failure 8, CABG 4, progression of coronary artery lesion 3, myocardial infarction 1, new onset of angina 1). Cumulative coronary artery event rate was 2% at 1year, 8% at 3 years, and 14% at 5 years. The risk factors for coronary artery event were: diabetes mellitus (HR=7.0, $p<0.001$), infected aneurysm (HR=21.9, $p=0.004$), history of PCI (HR=2.4, $p=0.04$), BMI>26 (HR=2.2, $p=0.04$), LVEF<0.6 (HR=2.5, $p=0.05$).

(CONCLUSIONS) Our results suggest that patients with diabetes mellitus, infected aneurysm, history of PCI, BMI>26 and LVEF<0.6 carry increased risk of coronary artery event after AAA repair, and careful follow-up of those patients is necessary.

O32-6

MANAGEMENT OF PERI-OPERATIVE MYOCARDIAL ISCHAEMIA-ROLE OF ANGIOGRAPHY?

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BACKGROUND Peri-operative MI is a relatively rare but potentially fatal complication following CABG and is due to graft related problems in a significant proportion of cases. Angiography, gold standard for pre-operative angina remains extremely underutilised for evaluation of peri-operative ischaemia. The aim of this study was to evaluate the role of angiography in the management of peri-operative ischaemia.

METHODS

Between January 2011 until Septmeber 2012, we performed 2312 isolated primary coronary artery bypass grafts. 26(0.01%) of these patients needed peri-operative angiography. The patients for angiography were identified based on our institutional algorithm. In presence of ST changes, recurrent VT/VF or increase in inotropic support, TnI and CPK-MB levels were measured and TEE performed. In presence of above signs and new regional wall dysfunction, the patient was taken for angiography.

RESULTS

ECG changes were seen in 19(79.1%) cases. arrhythmias in 8(33.3%) and ST changes in 11(45.8%). Eight (33.3%) patients had haemodynamic compromise. CK/ CK-MB ratio appeared elevated above the threshold of 10% set as significant was found only in 4 (16.6%) patients. Troponin (TnI) was raised in 6 patients (25%). TEE revealed regional wall dysfunction in 6 out of 24 (25%) patients undergoing angiography.

Mean time between operation and angiography was 24.58±6.71 hrs .Of the 26, patients undergoing angiography, 18 (69 %) had graft issues and needed re-operation. The overall mortality in the group re-operated for graft issues was 2 out of 18(11.1%). In the group where angiography was carried out within 48 hours no mortality was seen

RESULTS

In conclusion, angiography remains an extremely useful tool in identifying graft related causes and to discriminate them from non graft related ischaemia thus allowing appropriate management and based on our findings we would recommend a more liberal and early application of this diagnostic modality in this setting.

O33-1

CLINICAL APPLICABILITY OF LUNG AGE FOR POSTOPERATIVE COMPLICATIONS IN NON-SMALL CELL LUNG CANCER PATIENTS MORE THAN 70-YEARS UNDERWENT CURATIVE RESECTION

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OBJECTIVE:

While surgery for elderly patients with primary lung neoplasms has become relatively common with aging of populations, the high frequency of postoperative complications prevents broad application. Recently, the Japanese Respiratory Society (JRS) proposed lung age (LA) as the index of the lung function, however, there were few reports about the association between LA and risk factors of postoperative complications with non-small cell lung cancer (NSCLC) surgery. We here analyze the clinical applicability of LA for patients more than 70-years with NSCLC.

METHODS:

A total of 333 patients aged more than 70-years underwent curative resections for NSCLC from January 1998 to July 2012 at Kitasato University Hospital (mean age, 74±3.6; range 70-87). LA was calculated based on the formula given below by the JRS. It conducts a respiratory function test in all cases preoperatively, and divided into four groups by age gap (AG) between LA and the true age (TA), group A, AG <-5; B, -5 ≦ AG <+6; C, +6 ≦ AG <+15; D, AG ≧ +15. Comparisons of categorical data between the groups were analyzed.

RESULTS:

The number of patients in groups A/B/C/D was 84/80/82/87, respectively. In univariate analysis of preoperative factors for postoperative complications, gender, AG, Charlson Comorbidity Index and smoking demonstrated significant association ($P < 0.05$). In multivariate analysis using logistic regression, AG was picked up as variable selection, and it was independent factor for postoperative complications. The 5-year overall survival rate were 73/72/66/61% ($P = 0.06$), respectively. Although we found significant difference, but there was tendency of worse prognosis along with increased gap group.

CONCLUSIONS:

The AG between TA and LA was here found to be significantly associated with postoperative complications on univariate analysis, remaining an independent predictive factor after multiple regressions. It was considered that LA and AG are useful factors as prediction of the risk for postoperative complications.

O33-2

SOLITARY PULMONARY SQUAMOUS CELL CARCINOMA IN PATIENT WITH A HISTORY OF SQUAMOUS CELL CARCINOMA: METASTASIS OR SECOND PRIMARY?

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Background.

Primary and metastatic squamous cell carcinomas in lung are histologically indistinguishable, and the differential diagnosis between them, especially when the pulmonary nodule is solitary, is mainly dependent on clinical information such as location of lung lesion, tumor stage, and disease-free interval. Management of solitary pulmonary squamous cell carcinoma in patient with a history of squamous cell carcinoma may pose diagnostic and therapeutic challenge.

Methods.

Retrospective analysis by chart review was done. Study objective was 244 consecutive patients with antecedent cancer histories who subsequently underwent pulmonary resections for newly found solitary pulmonary nodules (new SPNs) from January 1998 to December 2007 at our institute.

Results.

Out of 244 patients, 36 had a history of squamous cell carcinoma (neck: 14, esophagus: 9, neck and esophagus: 3, lung: 5, anal canal: 1, unknown: 1, uterine cervix: 3), and 208 did not. The history of squamous cell carcinoma significantly associated with squamous pathology of new SPNs (22 out of 36, $p<0.0001$). Out of 22 new SPN with squamous pathology, 14 were diagnosed to be metastatic (mSQ) and 8 to be primary (pSQ). mSQ showed marginally shorter disease-free interval ($p=0.0818$) and smaller tumor size ($p=0.2045$) than pSQ. Overall survival and recurrence-free survival of pSQ were better than those of mSQ (OS: $p=0.0413$, RFS: $p=0.0282$). Notably, 6 intra-thoracic recurrences were observed in mSQ group.

Conclusions.

Current policy for differentiation between mSQ and pSQ mainly based on clinical information seems to be acceptable. In cases in which the origin of the pulmonary lesion is unclear, solitary lung squamous cell carcinoma should be treated as primary lung cancer because it may offer the best chance for cure.

O33-3

CLINICAL OUTCOME OF SALVAGE LUNG RESECTIONS AFTER DEFINITIVE CHEMORADIOTHERAPY FOR LOCALLY ADVANCED NON-SMALL CELL LUNG CANCER PATIENTS

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OBJECTIVE: Definitive chemoradiotherapy (CRT) is a standard treatment for locally advanced non-small cell lung cancer (LA-NSCLC) patients. We have previously reported the positive impact of induction CRT (approximately 46 gray) followed by surgery on clinical outcome in LA-NSCLC patients. Salvage lung resections after definitive CRT are occasionally required because of some reason but its clinical outcome has not been well-discussed. In this study, we examined the clinical outcome of salvage lung resection after definitive CRT in patients with LA-NSCLCs comparing with that of induction CRT followed by surgery.

METHODS: Between 1997 and 2009, a total of 74 LA-NSCLC patients underwent CRT followed by surgery. Among them, 61 patients underwent induction CRT (18-46 gray) followed by surgery (IC group). The other 13 patients initially received definitive CRT (50-70 gray) and underwent surgical resection because of the residue/regrowth of tumor and other reasons (DC group).

RESULTS: The frequency of combined resection of other organs was significantly higher in DC groups (69%) than in IC groups (25%; P = 0.013). Coverage of bronchial stump or anastomosis was significantly more frequently performed in DC groups (62%) than in IC groups (28%; P = 0.017). The frequencies of Ef3, ypN0 and pCR were higher in DC groups (62%, 85% and 54%, respectively) than in IC groups (38%, 67% and 64%, respectively). Post-operative complications occurred in 62% and 49% in DC and IC groups, respectively. The mortality rates were 0% and 1.6% in DC and IC groups, respectively. The 3- and 5- year overall survival rates were 76.9% and 68.4%, respectively, in DC group, versus 73.6% and 67.4%, respectively, in IC group.

CONCLUSIONS: Salvage lung resections after definitive CRT can be performed as safely as induction CRT followed by surgery, and it has as equally good clinical outcome as induction CRT followed by surgery.

O33-4

PREOPERATIVE AND INTRAOPERATIVE IDENTIFICATION OF SENTINEL NODES IN PATIENTS WITH NON-SMALL CELL LUNG CANCER

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Objective. With an increased incidence of small sized non-small cell lung cancer (NSCLC), sentinel node navigation surgery (SNNS) is important in ensuring the radicality of limited resection. Preoperative and intraoperative sentinel nodes (SNs) identification methods in clinical node-negative NSCLC patients were evaluated.

Methods. Preoperative CT lymphography (CTLG): An ultrathin bronchoscope was inserted to the target bronchus under the guidance of virtual bronchoscopic navigation images. CT images of the chest were obtained 30 seconds after 2 or 3ml of water-soluble extracellular CT contrast agent was injected through a microcatheter. SNs were identified when the maximum CT attenuation value of the lymph nodes in postcontrast CT images increased by 30 Hounsfield units (HU) or more compared to precontrast images. Intraoperative indocyanine green (ICG)-SNNS: Total 1ml of ICG was injected into peritumoral lung parenchyma intraoperatively. SNs were identified when ICG fluorescence positive lymph nodes were observed using a near-infrared fluorescence imaging system within 15 minutes after the injection. Patients underwent lobectomy with standard lymph node dissection by video-assisted thoracic surgery.

Results. CTLG and ICG-SNNS were performed in 21 and 45 patients, respectively. SNs identification rate of CTLG and ICG-SNNS were 95.2% (20/21) and 72.7% (32/44), and the average number of SNs were1.7 (1-4) and 1.3 (1-2), respectively. SNs were identified in pulmonary or hilar stations in 100% (20/20) by CTLG, and 71.8% (23/32) by ICG-SNNS. Pathologic examination revealed metastatic lymph nodes in 2 patients of CTLG group and 3 patients of ICG-SNNS group. All metastatic nodes were included in the SNs.

Conclusion. Relative low identification rate of ICG-SNNS suggests a limitation of ICG-SNNS in identifying the SNs deeply located in lung parenchyma. Combination of preoperative CTLG and intraoperative ICG-SNNS may improve the precision of SNs identification in patients with NSCLC.

O33-5

LONG-TERM FOLLOW UP OF GROUND-GLASS OPACITY LESIONS ON COMPUTED TOMOGRAPHY FOLLOWING RESECTION FOR PRIMARY NON-SMALL CELL LUNG CANCER

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OBJECTIVE. Pulmonary ground-glass opacity (GGO) lesions are often pointed out in chest computed tomography (CT) during the postoperative surveillance for primary non-small cell lung cancer (NSCLC). However, there is no clear consensus about the timing of therapeutic intervention on GGO lesions due to the slow growing nature. The objective of our study is to characterize the long-term fate of GGO lesions detected during the postoperative surveillance for NSCLC. METHODS. We retrospectively investigated 21 patients in whom GGO lesions were detected during postoperative follow-up CT on NSCLC and were followed up 5 years or more at The University of Tokyo Hospital from January 2000 to December 2007. We recorded clinicopathological features of the primary NSCLC and factors of GGO lesions. RESULTS. The pathological stagings of the primary NSCLC were IA in 17 cases, IB in 2 cases, IIB in 1 case, and IV in 1 case. Twenty primary tumors were adenocarcinoma. The median observation time was 77 months. The GGO lesion was identified before the resection of the primary tumor in 10 cases. Eight GGO lesions showed enlargement or emergence of the inner solid component. Three were resected at the end of the observation and were cofirmed as adenocarcinoma. No cancer related deaths were observed. CONCLUSIONS. Some GGO lesions do need to be treated even in the period exceeding 5 years after resection for primary NSCLC.

O33-6

BRONCHOSCOPIC LUNG MAPPING: A NOVEL STRATEGY FOR PRECISE LUNG CANCER RESECTION USING 3D IMAGES

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Objective: To support precise sublobar lung resection (wedge resection or (sub) segmentectomy) with safe surgical margin, we developed a bronchoscopic lung "mapping" technique utilizing 3D-virtual imaging.

Methods: According to operation plan, two-to-four mapping points (either close to a target lesion or at planned resection margin) were selected on the lung surface using 3D lung images built from thin-slice CT. Virtual bronchoscopy was used to select bronchi (4-6 branching levels) reaching the selected points. With mild sedation on a patient, 0.7-1 mL of indigocarmine was injected to each marking point through a metal-tip catheter inserted in a regular flexible bronchoscopy. The tip of the catheter was confirmed to be reaching the lung surface using fluoroscopy. Additional CT scan was taken to confirm the relationship among mapped points and target lesion(s) on 3D lung image, which was then used to guide actual lung resection.

Results: From July to November 2012, 17 lesions of 14 patients were planned for resection using this mapping procedure. The size of the lesions was 9.8±5.1mm (4-24mm). Selected surgical procedures include 6 wedge resection, 4 segmentectomy, and 4 single or combined subsegmentectomy. In one case, 2 ground glass opacity (GGO) lesions (7mm and 4mm) were removed by one wedge resection. In another case, 3 GGO lesions (15mm, 6mm, 4mm) were removed by combined subsegmentectomy of right lower lobe. All the lesions were successfully resected with satisfactory margin without complication associated with mapping procedure.

Conclusions: Unlike conventional CT-guided marking, bronchoscopic lung "mapping" allows for placing multiple spots not only to identify a lesion but also to secure resection margin. Thus far, no complication such as pneumothorax and air embolism was experienced. If a 3D imaging software is available, the technique is readily feasible with standard apparatus and instruments. Bronchoscopic lung mapping is useful for precise sublobar resection of lung cancer.

O34-1

A CLINICOPATHOLOGICAL ANALYSIS OF PULMONARY ADENOCARCINOMA WITH MICROPAPILLARY COMPONENT

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Objective: It is increasingly being recognized that adenocarcinomas containing micropapillary component (MPC) of various organs have a worse prognosis compared with those without MPC. The clinicopathological features and their prognostic significances of lung adenocarcinomas with MPC, however, remains to be detailed.

Method: MPC was defined as a small papillary tumor cell tuft lacking a central fibrovascular core. One thousand and forty-seven patients underwent surgical resection for primary lung cancer at the Thoracic Surgery, Kitasato University Hospital from Jan. 2002 to Oct. 2012. Six hundred and ninety-three cases, which were diagnosed as adenocarcinoma, were histologically reviewed, and tumors with ≧ 5% tumor cells arranged in MPC were selected as MPC(+) ones, followed by collection and analyses of their clinicopathological futures and prognostic significances.

Results: Of the 693 adenocarcinomas, 72 (6.9%) tumors harbored MPC which comprised 5% ~ 85% tumor cells in individual cases, and thus were classified as MPC(+) ones. There were 38 males and 34 females aged from 49 ~ 85 years (mean 65.6 years). Forty were non-smokers and 32 smokers. The 72 primary tumors sized from 1.6 ~ 6.5 cm (2.93±0.63 cm), and 65 and 59 tumors demonstrated lymphatic and vascular permeation, respectively. Forty-four tumors also invaded the pleura and 35 patients developed lymph node metastases. Thirty-nine patients were up-staged after operation due to more advanced lymph node metastasis, pleural invasion or intrapulmonary metastasis than expected. Of the 33 patients with a longer than 5-years post operative duration, 15 (45.4%) died of their disease and 2 were alive with disease. The prognostic significances of the absence or presence as well as the amount of MPC are currently analyzed in more details.

Conclusions: Our preliminary results suggest that tumor with MPC have a more aggressive biological behavior, and the factors conferring on this nature must be explored.

O34-2

IMPACT OF VISCERAL PLEURAL INVASION ON THE POST OPERATIVE RECURRENCE IN COMPLETELY RESECTED NON-SMALL CELL LUNG CANCER

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Objective: It is still controversial that visceral pleural invasion (VPI) influence the post-operative recurrence in completely resected non-small cell lung cancer (NSCLC). The aim of this study was to evaluate the influence of the extent of VPI to post-operative recurrence by using the multicenter retrospective database regarding the surgical series of NSCLC.

Method: We retrospectively reviewed the clinicopathologic characteristics and outcome of 426 NSCLC patients, who underwent anatomic complete resection at 9 hospitals in Yokohama Consortium of Thoracic Surgeons from 2005 to 2006.

Results: The median follow-up time was 61 months. Histological types were as follows; 274 in adenocarcinoma, 100 in squamous cell carcinoma, 24 in large-cell carcinoma, and 28 in others. The extent of VPI was pl0 in 308 patients, pl1 in 91 patients, and pl2 in 27 patients. The 5-year disease-free survival (DFS) rates of the pl0, pl1, and pl2 patients were 75.0%, 53.3%, and 52,2%, respectively, with significant difference between pl0 and pl1 ($p<0.01$), pl0 and pl2 ($p<0.01$). There was no significant difference between pl1 and pl2 ($p=0.891$). Analysis of the DFS stratified by lymph node metastases, pl0 had significantly higher DFS rates than that of pl1 and pl2 in N0 and N1 groups, but there was no difference in N2 groups. In any groups, there was no significant difference between pl1 and pl2. And more analysis stratified by tumor size (<3cm and >3cm) in N0 group, pl0 had significantly higher DFS rates than pl1 and pl2 in <3cm tumor group, but there was no difference in >3cm tumor groups.

Conclusions: We identified that the presence of VPI itself was a prognostic factor on the post-operative recurrence in a patients with T1N0-1M0. In these groups, the population with VPI should be upgraded to next stage like the 7th edition of the TNM classification.

O34-3

CANCER CELLS SCATTERED BY THE MANIPULATION IN THE SURGERY OF NON-SMALL CELL LUNG CANCER

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Background Completeness of resection is crucial to avoid recurrence in the surgery of non-small cell lung cancer (NSCLC). The surgical manipulation has some potential to spread cancer cells (isolated tumor cells; ITC) to the surgical margin or the blood. The clinical implications of them remain unclear and thus those were assessed.

Methods A total of 253 cases were investigated. Cytological examination at the surgical margins was carried out in 123 cases; completion wedge resection for compromised patients (n=37) and in patients who underwent lobectomy after a diagnosis of NSCLC using pulmonary wedge resection (n=86). In addition, cancer cells in the blood of the pulmonary vein were extracted by a CD45 negative selection technique in another case series (n=130). Survivals were calculated by the Kaplan-Meier method and the survival rates were assessed by the log-rank test.

Results In complete wedge resection cases, margin cytology findings were prognostic indicators of recurrence free survival and overall survival. All 7 cases of surgical margin recurrence was margin cytology positive. 5-year survival rate (5-YSR) was 38.5% for positive margin cases (n=13) and 79.2% for negative margin cases (n=24) (p=0.001). In additional lobectomy cases, the 5-YSRs were similar- 90.8% for the negative cytology cases (n=19) and 94.7% for the positive cases (n=67). In cases examined status of cancer cell existence in the blood of the pulmonary vein, ITCs were detected in 96 (74%) of the patients, with clustered ITCs (C) observed in 43, only single cell ITC (S) in 53 and no ITC (N) in 34. The disease-free survival rate was significantly worse in C cases (2-year relapse free survival rate- 23%) when compared with the others (P = 0.01).

Conclusion The surgical manipulation causes cancer cell scattering to the surgical margin or the blood, which may have clinical implications of wrong prognosis.

O34-4

IN-VIVO LOCALIZATION OF WIRELESS TAG: PROOF OF CONCEPT FOR NOVEL SURGICAL MARKING SYSTEM TARGETING SMALL PERIPHERAL LUNG NODULE

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OBJECTIVE: To investigate the potential of 1 mm-sized radio frequency identification (RFID) tag as a surgical marker, validation study was performed in experimental settings.

METHODS: The system consists of four parts: (a) micro RFID tags (13.56 MHz, 1.0 x 1.0 x 0.8 mm), (b) a tag delivery system with bronchoscope, (c) a wand-shaped locating probe (10 mm diameter), and (d) signal processing units with audio interface. Prior to the operation, an RFID tag was placed in the canine lung peripheral parenchyma via bronchoscope under CT scan guide. In the operative arena, the target area was scanned with the locating probe through thoracotomy. The operators can detect the tag following the sound, whose pitch changes according to the distance between the tag and the probe. Primary outcome was the rate of successful detection of the tag. Time required for detection and distance from the pleura to the tag at CT scan were also evaluated.

RESULTS: A total of 5 tags were embedded in 3 dogs; 3 in the right caudal lobes, 1 in the right cranial lobe, and 1 in the left caudal lobe. Each tag was delivered at a mean distance of 7.0 ± 6.5 mm from the pleura. A pneumothorax was occurred in one dog. During operative procedures, all tags were detected by the system within a median of 13.2 ± 8.8 seconds. Wedge resections were performed for all tags successfully.

CONCLUSIONS: Our RFID marking system proved to locate the 1mm-sized tag in canine lung. Accurate and quick localization of the tag was accomplished in 100% (5/5) of the procedures. Further improvements are ongoing with regard to the effective range and the delivery system.

O34-5

INDUCTION THERAPY FOLLOWED BY RESECTION FOR ADVANCED THYMIC TUMORS

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Objective: In advanced stage thymic tumor complete surgical resection is not always achievable because local regional invasion of nearby organs by thymic tumor is very common. These lesions are often found as advanced disease classified in stage III or IV of the Masaoka staging system, thus multimodality treatment may increase resectability and reduces the incidence of local and systemic relapses. We undertook a retrospective review to determine the outcomes of patients who underwent Induction therapy followed by resection for thymic tumors.

Methods: Between 2000 and 2012, 35 patients with thymic tumors were considered not radically resectable at preoperative workup, thus received induction chemotherapy or chemoradiotherapy followed by surgery. According to the Masaoka system, 17 were stage III, 11 were stage IVa, and 7 were stage IVb preoperatively (Histotype: A,1; AB,2; B1,3; B2,8; B3,8; C,13). The treatment plan included TJ(CBDCA/PTX),10; CDDP/DTX,10; ADOC(ADR/CDDP/VCR/CPA)8; CDDP/VP16,4; CODE(CDDP/VCR/ADM/ VP16),2; Steroid pulse,6. Fourteen patients received concurrent radiotherapy directed at the tumor and tumor invaded nodes at doses greater than 40 Gy.

Results: No preoperative mortality was recorded. Twenty-six (74%) had complete resection (CR) and 9 (cancer,5; thymoma,4) imcomplete resection (IR). The resection was extended to the lung (5 lobectomies, 2 pleural-pneumonectomy), left innominate vein (n=16), SVC (n=8), phrenic nerve (n=7), and right brachiocephalic artery (n=1). The median follow-up was 41 months and the 5-year tumor-related survival (5YS) was 84% (cancer, 52%; thymoma,100%). No statistical difference was found between stage III and IV (5YS, 100% vs 69%). The overall survival was better for CR as compared to IR (93% vs 71%, p=0.05). The 5YS was 67% for CR and 0% for IR in patients with thymic cancer (p=0.02).

Conclusions: Multimodality treatment of advanced thymoma guarantees good disease control and provides high survival rates. Complete resection significantly increased survival rate especially in patients with thymic cancer.

O34-6

VIDEO ASSISTED THORACIC SURGERY IN SEMI-PRONE POSITION -INITIAL EXPERIENCE AND BENEFITS OF LYMPH NODE DISSECTION-

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Objective: Recently, the prone position has been used for thoracoscopic esophagectomy for esophageal cancer because it is known to facilitate mediastinal dissection. We hypothesized that the advantage of the prone position could apply to standard thoracotomy and VATS lobectomy, which has been commonly performed with the patient in the lateral position.

Methods: Forty-six patients with clinical stage I non-small cell lung cancer (NSCLC) were enrolled in standard thoracotomy, the semi-prone and lateral position VATS lobectomy protocol. The surgical parameters of each group patients were compared.

Results: Seventeen patients underwent surgery in the standard thoracotomy group using rib retractors. Fifteen and fourteen patients underwent VATS in the lateral and semi-prone position group, respectively. There were three minor complications, chylothorax and heart failure in the thoracotomy group, atelectasis in the VATS lateral position group. Pathological n0 was confirmed 88.2%, 93.3%, and 100% in the thoracotomy, VATS lateral position, and VATS prone position group, respectively (data not significant).The number of dissected lymph nodes was significantly higher in the semi-prone position than in the standard lateral position for the inferior mediastinal nodes (average 9.1 and 7.9 lymphnodes), especially in the subcarinal zone.

Conclusions: To the best of our knowledge, this is the first report of complete VATS lobectomy with the patient in the semi-prone position. Although the number of cases was limited, the results of this study show that the semi-prone position has specific advantages especially in the sub-carinal zone and may reduce the surgeon's stress during complete VATS lobectomy.

O35-1

RISK FACTORS FOR RECURRENCE AFTER VATS PLEURODESIS FOR PRIMARY SPONTANEOUS PNEUMOTHORAX

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OBJECTIVE: After Video-Assisted Thoracic Surgery (VATS) for Primary Spontaneous Pneumothorax (PSP), a minority of patients still have recurrence. Risk factors for recurrence have still not been completely identified or understood.

METHODS: VATS bleb resection and abrasion pleurodesis was performed on 318 patients with PSP, including 286 men and 32 women with a median age of 21 years (range 15-40). Patients with suspected secondary pneumothorax and those receiving redo-VATS for pneumothorax were excluded. Clinical data was collected after a median follow-up time of 41 months (range 1-79).

RESULTS: Recurrent pneumothorax occurred in 29 patients (9.1%), including 15 who required re-interventions (4.7%). On Kaplan-Meier survival analysis, recurrence showed trends for association with: use of older generation endoscopic staplers (Hazard Ratio 1.98, p=0.07); stopping suction for 1 day prior to chest drain removal (HR 1.85, p=0.12); requirement of additional post-operative chemical pleurodesis (HR 2.34, p=0.10); and inter-pleural air space on CXR after drain removal (HR 1.78, p=0.11). Recurrence was significantly associated with longer mean operation times (92±40 mins versus 55±29 mins, p=0.01), and incidence of greater than 'mild' levels of pain on coughing immediately after surgery (96% versus 71%, p=0.01). Patient factors such as demographics, medical history, previous contralateral pneumothorax, and presenting symptoms did not correlate with recurrence. Surgical factors including use of needlescopic surgery, surgery performed by trainees, intra-operative adjunctive chemical pleurodesis, and post-operative length of stay also failed to correlate with recurrence. Paradoxically, patients who smoked pre-operatively showed a trend for lower recurrence risk (HR 0.49, p=0.09).

CONCLUSIONS: Recurrence after VATS for PSP generally cannot be attributed to patient factors. Instead, the key risk factors concern intra- and post-operative management for which surgeons have both control and responsibility. The potential benefits of expeditious surgery using modern staplers, careful chest drain management and aggressive pain control in limiting recurrence warrant further study.

O35-2

THE ANTERIOR RIB CUTTING TECHNIQUE FOR DELIVERY OF LARGE TUMORS DURING VATS LUNG CANCER SURGERY

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OBJECTIVE: Although large tumors are no longer contra-indications for lobectomy using Video-Assisted Thoracic Surgery (VATS), the optimal technique for delivering them via the intercostal space remains uncertain.

METHODS: Data regarding tumor size and delivery techniques were available for 258 patients receiving VATS lobectomy for primary lung cancer by a single surgeon. Techniques for delivering the resected lobe included: Complete VATS (C-VATS) without rib-spreading (n=206, 80%); resection of a short rib segment (n=9, 3%); brief rib-spreading (n=12, 5%); conversion to mini-thoracotomy (n=21, 8%). The latter three non-C-VATS techniques have been previously described for retrieving larger tumors following VATS lobectomy. In 10 patients (4%), a novel anterior rib-cutting technique (ARCT) was used: one rib at the utility port received controlled fracture near its anterior end to widen the intercostal space without rib-spreading for lobe delivery, and was re-approximated afterwards.

RESULTS: Demographic and clinical characteristics were similar in all study arms. There was no mortality or major morbidity in the ARCT group. The mean tumor diameter in the ARCT group was 5.4±3.4cm which was significantly larger than the C-VATS group (2.3±1.4cm, p=0.017), but similar to the other groups. Mean operation time and blood loss in the ARCT group were similar to the other non-C-VATS groups. Patient pain scores and analgesic use in the ARCT group were similar to those in the C-VATS group immediately after surgery and on post-operative day 1. Patients receiving ARCT experienced shorter mean post-operative lengths of stay than those receiving other non-C-VATS techniques (5.6±2.8 days versus 10.0±7.1 days, p=0.003).

CONCLUSIONS: During VATS lobectomy, the ARCT approach is a safe and feasible means for delivering tumors too large to fit through the intercostal space. Patients experience no more pain than if C-VATS with no rib-spreading was performed. Compared to other non-C-VATS approaches, the ARCT approach may allow faster post-operative recovery.

O35-3

THORACOSCOPIC REPAIR OF PECTUS EXCAVATUM USING DIFFERENT BAR STABILISERS VERSUS SURGICAL REPAIR

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OBJECTIVES: The aim of this study is to identify the preoperative characteristics and to compare operative variables and postoperative outcomes in adult patients with pectus excavatum undergoing thoracoscopic repair using different bar stabilisers versus surgical repair.

METHODS: We conducted a prospective study between July 2009 to July 2012 in our Thoracic surgery department in King Fahd Hospital. They were 31 patients [26 male and 5 female] aged 18-35years. Patients were subdivided into three groups: group (A) 9 patients underwent modified Ravitch repair, group (B) 11 patients underwent video-assisted thoracoscopic repair using metal stabilisers and group (C) 11 patients underwent video-assisted thoracoscopic repair using absorbable stabilisers. Preoperative, intra-operative, postoperative variables and mortality are compared in all groups.

RESULTS: In all groups, preoperative variables were well matched for age and sex. Operative time was statistically highly significant; it was longer in Group [A]. There was no intra-operative complication in all groups. Postoperative length of hospital stay was statistically significant; it was shorter in Group [A]. Postoperative complications occurred in seven patients (22.6%) mostly in group [B] and group [C]. There was no perioperative mortality in all groups. All patients were satisfied with the cosmetic results.

CONCLUSIONS: Video-assisted thoracoscopic repair of pectus excavatum in adult patients can be performed safely using either metallic or absorbable bar stabiliser with no intra-operative complications and excellent immediate results, but absorbable bar stabiliser are more vulnerable and break easier than metal stabilisers.

Key Words: Pectus excavatum, Ravitch, Thoracoscopic, Nuss repair.

O35-4

PROSPECTIVE COHORT STUDY OF TWO TYPES OF VATS LOBECTOMY FOR CLINICAL T1N0 LUNG CANCER WITH SPECIAL REFERENCE TO POSTTHORACOTOMY PAIN AND LONG TIME SURVIVAL

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OBJECTIVES: In order to provide less invasive procedure in VATS, it is necessary to evaluate two types of VATS approaches prospectively.

METHODS: We have conducted prospective feasibility study of strictly-defined two types of VATS lobectomy by prospective cohort. By based on free patients' decision after similar preoperative explanation using same table, perioperative factor especially postthoracotomy pain and long time survival were evaluated assisted in VATS and complete VATS groups.

RESULTS: We reviewed 104 consecutive patients with clinical T1N0M0 non-small cell lung cancer (NSCLC). 26 cases (ASSIST group) chose lobectomy performed through an anterolateral small thoracotomy with the use of a rib spreader in combination with under thoracoscopic view and direct view. 78 cases (PURE group) chose complete VATS in which only a monitor was used during smaller access thoracotomy without a rib spreader. Clinical parameters of both VATS approaches were acceptable in clinical practice. ASSIST group had significant high odds ratio of additional painkiller on epidural anesthesia against PURE group by multivariate logistic regression analysis. Patients in PURE group exhibited early recovery from surgery, however still required much operation time. Recurrence free and overall 5-year survival rates were equivalent.

CONCLUSIONS: Both PURE and ASSIST are feasible in terms of perioperative factors and long time survival rates. PURE were less invasiveness to the chest wall than ASSIST.

O35-5

EARLY RESULTS OF SINGLE PORT (UNIPORT) VIDEO-ASSISTED THORACIC SURGERY LUNG RESECTION

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Objective:
Technological and technical advances in video-assisted thoracic surgery (VATS) have allowed further minimizing of access trauma in the form of single port VATS (SPVATS) lung resection. SPVATS may be associated with less pain, quicker recovery and improved cosmesis. We review our experience and early outcomes for patients following SPVATS wedge resection (W), lobectomy (L) and pneumonectomy (P).

Methods:
Retrospective study of SPVATS lung resection performed between May 2012 and November 2012 at our institution. Preoperative, intraoperative and postoperative data were reviewed.

Results:
We performed SPVATS for 6 wedge resections (2 hook wire guided), 2 left lower lobectomies, 1 right lower lobectomy and 1 left pneumonectomy. The pathology for W were 2 benign, 2 granulomas, 2 metastatic lesions (both for colonic carcinoma metastases). Lobectomies and pneumonectomy were performed for early stage non-small cell lung carcinoma. Mean port length were 3.5, 4.2, and 5.5 cm for groups W, L, and P respectively. Mean intraoperative blood loss for W was 5 mls, L 80 mls and P 100 mls. Mean operative durations were 42, 169, 175 minutes for W, L and P groups respectively. Mean postoperative chest drainage in first day were W 70 mls, L 130mls, and P 180mls. Mean chest drain duration were 1.5 days for W, 2 days for L and 1 day for P. Patients were discharged home on day 2 for W, day 3 for L, and day 5 for P. There was no mortality or major morbidity. There was 1 minor wound infection in L group at follow-up. (mean follow-up 4 months (range 0 to 6 months)).

Conclusions:
Our early experiences with SPVATS lung resection have shown that it is a safe procedure with good early clinical outcomes, which can be introduced into an advanced VATS program centre. The long term outcomes will need further investigation.

O35-6

NEEDLESCOPIC VIDEO-ASSISTED THORACIC SURGERY PERICARDIAL WINDOW: THE INITIAL EXPERIENCE

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Objectives: Pericardial window is a well accepted procedure for management of recurrent pericardial effusion and aid diagnosis of pericardial pathology. The most popular approach is the open technique via anterior mini thoracotomy or subcostal incisions. Needlescopic 3mm video-assisted thoracic surgery pericardial window is an attractive alternative to standard VATS or open pericardial window, with potential for further reduction in access trauma and quicker recovery. We report our technique and experience of needlescopic VATS pericardial window.

Methods: Eight patients underwent needlescopic VATS pericardial window between June 2011 and November 2012. The patients received general anaesthesia and double lumen endobronchial tube intubation. Excision of pericardium and window creation was performed in the semi-lateral position via two 3mm instrument ports and a 1cm camera port. Operative details and outcomes are analyzed.

Results: Eight patients with mean age of 67 years (range 48- 78) underwent the procedure. Six patients had known underlying malignant pathology. A 3 by 3 cm piece of pericardium anterior to phrenic nerve was excised and pericardial fluid drained. 5 patients had left and 3 had right sided procedures. The mean operative time was 45 minutes (range 37-56 minutes). Mean intraoperative pericardial fluid drained 370 mls (range 200- 750 mls). The procedures were successfully completed in all patients. Mean postoperative chest drain duration was 3.5 days (range 2-5 days). Mean visual analogue pain score following chest drain removal was 2.2 (range 1.2-3.7). There was no postoperative complication or 30-day mortality.

Conclusions: Needlescopic VATS pericardial window for malignant and benign pathology is a safe and effective procedure. The long term outcomes and potential benefits of this technique warrant further investigation.

O35-7

COMPLETE VATS S10 SEGMENTECTOMY VIA POSTERIOR APPROACH (WITHOUT INTERLOBAL APPROACH)

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(OBJECTIVE) S10 pulmonary segmentectomy is one of the complicated operations, because we are sometimes confused at the anatomical construction of pulmonary veins. We performed complete VATS S10 segmentectomy without interlobar approach. We also examined one hundred lung cancer patients on chest CT scan for anatomical possibility of this operation. (PATIENT AND METHODS) A 68 year-old male admitted with a 12mm in diameter GGA at the right S10 segment. We approached vie five thoracoscopic ports, the partial resection proved Bronchial alveolar carcinoma with pathologically. We performed S10 segmentectomy without interlobar approach. The pulmonary ligament was cut the first thing. The V10a was ligated and cut, the lung was divided along the V9. We made sure the B10 and A10, and cut by end-staplers. The segment 10 was resected by electrocautery along the segmental plane. The operating time was 148 minutes, bleeding volume were 10 ml. He was pulled off the chest drainage tube on 5 days and discharged on 7 days after operation. According to the chest CT scan of one hundred patients, 96% cases are possible in the right side and 85% in the left side. (CONCLUSIONS) VATS S10 segmentectomy via posterior approach may be feasible and convenient for 96% patients in the right lung and 85% in the left lung.

O35-8

COMPARISON OF SURGEON'S LINE OF SIGHT BETWEEN OPERATIVE PROCEDURES USING A MULTIFACETED MARKER DEVICE

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OBJECTIVE: We performed video-assisted thoracoscopic surgery (VATS) that used both direct vision through minithoracotomy and television monitor. We analyzed the difference of surgeon's line of sight between operative procedures.

METHODS: We used an infra-red optical tracking system. The use of optical tracking devices is associated with problems regarding reflection angle and marker shielding. We devised a multifaceted marker device which could measure the surgeon's head motion three dimensionally and analyze indirectly his line of sight. We studied the surgeon's head motion because a surgeon generally turns his head to gaze at distantly-positioned objects with central vision rather than taking a side glance. A surgeon's line of sight can be almost determined by measuring head pose during operation. We measured surgeon's line of sight during VATS and contrast between operative procedures; bullectomy under three port, left upper wedge resection and right upper lobectomy.

RESULTS: The ratios of monitor viewing and direct vision 81.3:14.2 in bullectomy, 53.4:40.8 in wedge resection and 19.9:75.2 in lobectomy respectively. In addition, we succeed in measuring the ratio, distribution and trajectory of surgeon's line of sight depending on the situation during VATS.

CONCLUSION: To the best of my knowledge, no one reported the line of sight during VATS, we advanced one method to analyze surgeon's line of sight during VATS for the first time.

O35-9

LONG TERM OUTCOME OF THE VATS LOBECTOMY FOR STAGE II AND STAGE III LUNG CANCER

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Objective:
VATS lobectomy for early stage lung cancer is becoming standard procedure, supported by the evidence of its non-inferiority about perioperative and long-term outcome. But little is known for its outcome for advanced lung canver.

Methods:
We retrospectively analyze the cases treated by VATS lobectomy or VATS segmentectomy with curative intent from January 2000 to December 2009, and pathologically diagnosed with Stage II and Stage III. Kaplan-Meier analysis of disease free survival and overall survival was performed.
Results:
There were 147 cases, 31 stage IIA, 49 stage IIB, 60 stage IIIA and 7 stage IIIB. 126 cases (85.7%) received VATS lobectomy and mediastinal lymph node dissection. 12 cases (8.16%), older than 80, received hilar lymph node dissection. We did 5 cases (3.40%) of VATS segmentectomy and 5 cases of VATS bilobectomy. Median follow-up was 41 months (1-104 month). 79 patient (53.7%) was recurred and 61 patient (41.5%) died. 5 year survival rate was 60.8% in stage IIA, 56.8% in stage IIB and 47.6 in stage IIIA. 5 year disease free survival was 30.7 % in stage IIA, 50.8 % in stage IIB and 30.7 in stage IIIA.
Conclusion:
Long term outcome of the VATS lobectomy for advanced lung cancer was comparable to reported data. We should accumulate the cases for further investigation.

O36-1

SURGICAL MANAGEMENT OF SECONDARY SPONTANEOUS PNEUMOTHORAX IN PATIENT WITH COPD AND INTERSTITIAL PULMONARY FIBROSIS

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OBJECTIVE: Secondary spontaneous pneumothorax (SSP) is caused by various diffuse lung disease. We tried to clarify the suitable surgical treatment for SSP in each subset of the underlying disease. METHODS: We retrospectively reviewed the records of 180 consecutive surgical treatments on 169 patients who underwent thoracoscopic surgery for SSP between 1993 and 2012 at our institution. We divided the patients into three groups: the C group consisted of patients with SSP due to chronic obstructive pulmonary diseases (COPD), the I group due to interstitial pneumonitis (IP), and the O group due to other than COPD and IP. We compared demographics, surgical characteristics and outcome among the three groups. RESULTS: Among consecutive patients, we enrolled 107 patients (112 surgeries) as the C group, 20 patients (24 surgeries) as the I group. and 40 patients (44 surgeries) as the O group. The duration of the operations in the C group (mean, 123 min) was significantly longer than that in the I group (mean, 75 min) ($p< 0.001$). Over 100ml bleeding volume during surgery was more frequently observed in patients in the C group (22%) than that in the I group (5%) ($p<0.01$). Bullectomy was performed more frequently on patients in the C group (72%) than that in the I group (37%) ($p<0.01$). Hospital mortality was significantly higher in the I group compared with the C group ($p<0.01$): Three patients in the C group (3%) died of pneumonia and cardiovascular event and five patients in the I group (25%) died of worsening interstitial pneumonitis, empyema and sepsis. CONCLUSIONS: In spite of the longer duration of the operation and massive bleeding due to severe adhesion, surgical treatment is feasible for patients with SSP caused by COPD. In the contrast, the surgical indication for patients with SSP caused by IP might be determined carefully.

O36-2

THYMECTOMY BETWEEN VIDEO-ASSISTED THORACOSCOPY AND DIFFERENT OPEN SURGICAL TECHNIQUES

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OBJECTIVE: Thymectomy is well established in the treatment of myasthenia gravis. Numerous techniques for performance of thymectomy have been described and published. We conducted this study to compare the outcomes of the three distinctly different operative techniques which are thymectomy through total median sternotomy, partial median sternotomy and video-assisted thoracoscopy

METHODS: Between January 2008 and December 2011, Thirty patients (9 male and 21 female) aged 20-65 years were included in this study. Patients were subdivided into three groups: group (A) 10 patients underwent thymectomy through total median sternotomy, group (B) 10 patients underwent thymectomy through partial median sternotomy and group (C) 10 patients underwent thymectomy through video-assisted thoracoscopy. Preoperative, intra-operative, postoperative variables and mortality are compared in all groups.

RESULTS: In all groups, preoperative variables were well matched for age, sex and preoperative clinical staging according to the MGFA clinical classification. Operative time was statistically highly significant; it was longer in Group [C]. There was no intra-operative complication in all groups. Also, postoperative length of hospital stay was statistically highly significant; it was shorter in Group [C]. Postoperative complications occurred in three patients (10%) mostly in group [A] and group [B]. There was no perioperative mortality in all groups.

CONCLUSIONS: We conclude that video-assisted thymectomy is effective as the traditional open surgical approaches for performance of thymectomy in the management of patients with myasthenia gravis. In addition, the improved cosmesis of the video-assisted approach ideally will lead to earlier thymectomy in patients with myasthenia gravis.

Key Words: Myasthenia gravis, Thymectomy, sternotomy, thoracoscopy.

♥ O36-3

INTERCOSTAL MUSCLE FLAP AND INTRACOSTAL SUTURE TO REDUCE POST-THORACOTOMY PAIN

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Objective:
Thoracotomy is considered to be the most painful surgical access route. The most common determinant of this pain is the degree of inadvertent injury to intercostal nerves during surgery. The resultant effect of protecting both the intercostal nerves during surgery has attracted many researches. The main objective of this study was to evaluate the effects of protecting the intercostal nerve on post-thoracotomy pain.

Methods:
It is a prospective, randomized and controlled study spanning a period of 15 months with patients undergoing thoracotomy being randomized to two groups: conventional group (pericostal sutures for closure of thoracotomy) and interventional (intracostal sutures for closure, and harvesting of an intercostal muscle flap in the beginning). Postoperatively, all the patients followed the same pain protocol.

Results:
Forty eight patients entered final analysis. Both groups were comparable by various parameters. Pedicle harvest time and intracostal suture time were 5.2±1.56 min and 3.65±0.71 min, respectively. Pericostal suture time was 6.4±1.20 min. Postoperative pain scores were consistently lower in the interventional group throughout the study period. The differences in scores till 1 month were statistically significant. At 3 months, none of the interventional group patients had constant pain, while 36% of the other groups did. The overall frequency of pain was significantly lower in the former (p=0.001). More patients in the conventional group had trouble lying on the operated side.

Conclusion:
This study has shown that the use of intercostal muscle flap harvest and intracostal suture in open thoracic surgery leads to a reduction in the acute and chronic post-thoracotomy pain, without increasing any complication.

Key words:
Intercostal muscle flap, intercostal nerve injury, intracostal suture, pericostal suture, post-thoracotomy pain.

♥ : Travel Grant

O36-4

HYDROGEN GAS REDUCES HYPEROXIC LUNG INJURY VIA THE Nrf2 PATHWAY

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Objective: Highly concentrated oxygen is routinely administered to patients with hypoxemia including post-operative state of lung surgery. Over a prolonged period, oxygen toxicity can occur, causing hyperoxic lung injury. Successful abrogation of hyperoxic lung injury is critical. Recently, hydrogen has been recognized as a medical gas. We have demonstrated that hydrogen can reduce hyperoxic lung injury and induce heme oxygenase (HO)-1, a heme-degrading enzyme that protects against oxidative damage. To investigate underlying mechanisms of the HO-1 induction by hydrogen, we highlighted the critical role of the redox-dependent transcription factor, NF-E2-related factor 2 (Nrf2), in regulating expression of HO-1.

Methods: We randomly assigned wild type ($Nrf2^{+/+}$) or Nrf2-deficient ($Nrf2^{-/-}$) C57BL/6J mice to four experimental groups and administered the following gas mixtures for 60 hours: 1) air with 2% nitrogen, 2) air with 2% hydrogen, 3) 98% oxygen with 2% nitrogen, 4) 98% oxygen with 2% hydrogen. We examined lung function by blood gas analysis of the arterial blood (pO2), tissue lipid peroxidation by assessing malondialdehyde (MDA) levels and expression of HO-1 and Nrf2-dependent genes.

Results: When mice were exposed to 98% oxygen for sixty hours, their pO2 levels decreased, and tissue MDA levels increased. Hydrogen treatment significantly improved blood oxygenation in $Nrf2^{+/+}$ mice and reduced lung MDA levels in both $Nrf2^{+/+}$ and $Nrf2^{-/-}$ mice. However, there was no protective effect in $Nrf2^{-/-}$ mice. Real-time RT-PCR revealed that the Nrf2-dependent genes including HO-1 were up-regulated in the $Nrf2^{+/+}$ mice lungs receiving hydrogen during hyperoxic conditions. In $Nrf2^{-/-}$ mice, hydrogen did not induce these genes. We also found that transcriptional activation of Nrf2 decreased under hyperoxic conditions and recovered to baseline levels with hydrogen treatment.

Conclusions: Our study demonstrated that hydrogen can ameliorate hyperoxic lung injury by modulating the Nrf2 signaling pathway.

O36-5

CARINAL SURGERY

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OBJECTIVE : Carina is a cartilagenous ridge within the trachea ,that runs between the two primary bronchi, at the site of tracheal bifurcation.Carinal surgery is challenging because of challenges in exposure, limits in mobilization and resection and anaesthetic and surgical management.

METHODS : From 1990 to 2012 we have had 34 cases which needed carinal exposure and mobilization.

RESULTS : To obtain good results ,proper preoperative evaluation with plain and contrast CT scan with 3D reconstruction ,bronchoscopic assessment with careful measurement of extent of disease,this will help us to assess if the patient is operable or not.Care should be taken to prevent excising too much of carina when the cut ends cannot be anaestamosed without tension. Carinal mobilization has been done in 32 cases with right thorocotomy, one case with midline sternotomy and two cases with concommittent left thorocotomy. Carinal relese measures include cutting the inferior pulmonary ligament,making an U shaped incision in the pericardium just below the inferior pulmonary vein and mobilizing all the hilar vessels, lower end of trachea, carina , main bronchi and mobilizing the trachea In the lower trachea and carina, the limit of extent of resection, in our hands has been only 2.5 centimetres. Careful anaesthetic management has to be planned along with the anaesthetist. Sterile crossfield ventilation during surgery is very useful. we prefer interrupted absorbable sutures 3-0 or 4-0 PDS with knots outside the trachea. Anaestamosis has to be tension free. Carinal miobilization had to be done for carinal left pneumonectomy - 2, carinal right pneumonectomy - 2, carinal tumors - 6, low tracheal tumors - 8, low tracheal stenosis -2, right sided sleeve resection -8, traumatic bronchial rupture - 6

CONCLUSION : Carinal surgery is challenging and needs careful preoperative preparation, anaesthetic support, peroperative care.The results get better as the team gets more experienced.

O36-6

USE OF A DIGITAL CHEST DRAIN SYSTEM IN THORACIC SURGERY: LESSONS FROM THE LEARNING CURVE

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OBJECTIVE: We previously reported that digital chest drain systems can improve air-leak assessment and clinical outcomes following thoracic surgery. The impact of introducing such new technology in routine clinical service has not been fully investigated.

METHODS: The Thopaz digital chest drain system (Medela, Switzerland) was introduced in our unit in 2008. Since then, 264 patients receiving major thoracic surgery and their nurses completed questionnaires regarding their chest drain experiences. Sixty-two patients (23%) received the Thopaz and 202 (77%) a standard water-seal (WS) system.

RESULTS: Overall, Thopaz group patients showed strong trends for shorter stays (5.7 versus 8.3 days, p=0.076), and lower incidences of delayed mobilization and of perceived restricted mobility. Benefits of the Thopaz were most marked in the first three years of the study, including lower incidences of delayed sitting out of bed (0% versus 23%, p=0.035) and of delayed mobilization (6% versus 30%, p=0.047), and fewer patients feeling encumbered by the chest drain (25% versus 58%, p=0.019). Paradoxically, the magnitudes of these advantages were reduced in the latter two years of the study, largely because the Thopaz was increasingly entrusted to manage difficult cases of air-leakage (12% versus 0%, p=0.001). Nurses reported significantly less confidence using the Thopaz than WS systems. Negative nursing opinions were more pronounced in the latter two years of the study, coinciding with the replacement of many experienced nurses by newly graduating nursing students. In reality, perceptions between nurses of difficulty in chest drain management scored less in the Thopaz group (5.3 versus 6.0, p=0.048).

CONCLUSIONS: The learning curve shows that introducing digital chest drains quickly achieves clinical benefits, but their advantages can be obscured by increasing reliance on them to manage complex patients. Assimilating such new technology can be intimidating for less experienced nurses, but objective observation reveals nurses manage well.

O37-1

OUTCOME OF LUNG TRANSPLANTATION FOR PROGRESSIVE DIFFUSE PANBRONCHIOLITIS

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OBJECTIVE: Diffuse panbronchiolitis (DPB) is a rare complex genetic disease affecting East Asians. DPB is characterized by chronic sinobronchial infection and diffuse bilateral micronodular pulmonary lesions consisting of peribronchial infiltration of inflammatory cells. Although the use of long-term therapy with macrolide antibiotics significantly improved the survival of DPB patients, some DPB patients deteriorate despite the macrolide therapy, requiring lung transplantation (LTx). LTx for DPB patients has been rarely reported and the outcome after LTx remains unknown. We describe our experience of LTx for DPB. METHODS: We retrospectively analyzed 5 LTx for DPB of 101 LTx at our institution between October 1998 and November 2012. RESULTS: The male-to-female ratio was 1:4, and median age at LTx was 37 years (27-40 years). Bilateral cadaveric LTx and living donor lobar LTx were performed for 4 and 1 DPB patients, respectively. Three of 5 patients had undergone the radical operation for chronic paranasal sinusitis before transplantation. All patients received long-term macrolide therapy for DPB, and as a result, *Pseudomonas aeruginosa* was preoperatively isolated in the sputum of all patients. After LTx, 4 of 5 recipients required tracheostomy and prolonged mechanical ventilation for a median time of 21 days (2-26 days). While one patient had severe acute rejection episode (A3), no recipient developed severe pneumonia or fatal infectious disease. Histological examination revealed chronic inflammation localized mainly in the respiratory bronchioles with characteristic interstitial accumulation of foamy histiocytes, neutrophils and lymphocyte infiltration, suggesting DPB. All 5 patients have survived and have not encountered bronchiolitis obliterans syndrome or DPB recurrence at a median follow-up of 2 years (0.8-9.4 years). CONCLUSIONS: Lung transplantation is a viable option for the treatment of progressive DPB.

O37-2

CHRONIC REJECTION MODEL IN MURINE ORTHOTOPIC LUNG TRANSPLANTATION

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Objective: Obliterative bronchiolitis is the key impediment to the long-term survival of lung transplant recipients and the lack of a robust preclinical model precludes examining obliterative bronchiolitis immunopathogenesis. Unlike other solid organ transplants, vascularized mouse lung transplantation has only recently been developed. Here we show our independently developed obliterative bronchiolitis model after murine orthotopic lung transplantation.

Methods: Applying the basic principles of the rat single-left lung transplant, we initiated murine orthotopic single-left lung transplant model using cuff technique. Two orthotopic lung transplant groups were studied: isograft: C57BL/6(H-2b) → C57BL/6 and allograft: C57BL/10(H-2b) → C57BL/6, which are major histocompatibility complex compatible but minor histocompatibility antigen incompatible. Recipient's mice were euthanized at day 7, 14, 21 and 28 after lung transplant. Histological features of native and donor lung using H&E and Masson's trichrome stain were assessed. Splenic expressions of transcripts for cytokine were determined by quantitative reverse transcription-polymerase chain reaction. Systemic expression of each cytokine was determined in serum by Enzyme-linked Immunosorbent assay.

Results: We achieved a 96% (96/100 consecutive surgeries) perioperative survival rate. For all procedures, the warm ischemia time was 14.32 ± 3.14 minutes, and cold ischemia time was 58.51± 18.06 minutes. Whereas we observed mild or no rejection in isograft (C57BL/6 → C57BL/6), allograft (C57BL/10 → C57BL/6) developed acute or chronic rejection and obliterative bronchiolitis was present in 55% of mice at day 21 and 44% at day 28. IL-17A, but not IL-17F, splenic mRNA transcripts and serum protein levels were increased only in mice that developed obliterative bronchiolitis, whereas IL-10 transcripts and protein were increased only in non-obliterative bronchiolitis mice.

Conclusion: We initiated the obliterative bronchiolitis model using minor histoincompatible antigen murine orthotopic single-left lung transplants which allows the further study of obliterative bronchiolitis immunopathogenesis.

O37-3

EVALUATION OF CERULOPLASMIN LEVELS IN PATIENTS WITH PULMONARY CYSTIC ECHINOCOCCUS

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OBJECTIVE: In this study, we aimed to evaluate serum CP levels in the serum samples before and after the surgical interventions in patients with pulmonary cystic echinococcus (CE).

METHODS: Forty-eight patients with pulmonary CE who underwent surgery and 48 healthy individuals were enrolled to the study. Patients were divided in two groups; group 1 (n=48) consisted of patients with pulmonary CE, and group 2 (n=48) consisted of healthy subjects. Before and after surgical interventions serum CP levels were measured.

RESULTS: Compared to group 2, group 1 had significantly higher CP levels at baseline ($p < 0.001$). In group 1; CP levels were significantly decreased after the surgical intervention ($p < 0.001$).

CONCLUSIONS: The present study showed that CP levels increased in patients with pulmonary CE; chronic inflammation may cause these rises, and may be an immune response of the host, and these levels decreased after the surgical intervention.

O37-4

MANAGEMENT OF CHYLOTHORAX AFTER PULMONARY RESECTION AND MEDIASTINAL LYMPH NODE DISSECTION FOR LUNG CANCER

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Objective: Chylothorax complicating pulmonary resection for lung cancer is a rare but a complication to be careful during operation in thoracic surgery. However treatment guideline is not established. This study aimed to investigate appropriate treatments for chylothorax complicating pulmonary resection.

Methods: We extracted from lung cancer database of our hospital and retrospectively reviewed 67 patients who were diagnosed with chylothorax among 3120 consecutive patients who underwent pulmonary resection and lymph node dissection between January 2000 and December 2010. We analyzed biochemistry of pleural fluid in case that chest tube drainage is increased or the color of drainage is milky after normal diet and confirmed chylothorax when triglyceride level is higher than 110mg/dl.

Results: Chylothorax was more common on right side(48 right vs. 19 left, p=0.033). Initially, all cases were treated conservatively with NPO(46 patients) or low long chain triglyceride(LCT) diet(21 patients). In NPO group, 24 patients were successfully treated, 20 patients underwent pleurodesis. Surgery was undergone without pleurodesis after failure of NPO in 2 patients. In low LCT group, 11 patients were failed. 4 patients of them were improved after NPO, 7 patients were treated with pleurodesis. NPO or low LCT as initial treatment didn't show significant differences of success rate, hospital day, and chest tube drainage. Total 32 pleurodesis were conducted in 27 patients and all of them were treated successfully. Although total hospital day in pleurodesis group(PG) was significantly longer than non-pleurodesis group(NPG) ($p<0.001$), hospital day after pleurodesis was significantly shorter than NPG ($p=0.004$). Mean chest tube drainage during 3 days after initial treatment with NPO or low LCT was significantly difference between PG and NPG (224ml vs. 418ml, $p<0.001$).

Conclusions: Conservative treatment can be considered as initial treatment for chylothorax complicating pulmonary resection.

O37-5

THE EVALUTAION OF QUANTIFERON-TB TEST AS A SCREENIG FOR PATIENTS BEFORE THORACIC SURGERY

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Objective:

The high incidence of Mycobacterium Tuberculosis (TB) infection have been an issue in Japan. We are sometimes experienced TB is diagnosed after thoracic sugery, though preoperative TB test is negative. We evaluated the usefullness of QuantiFERON-TB (QFT) test as a screening for the patients before theracic surgery.

Methods:

Between March 2009 and October 2012, 341 patients underwent QFT test before thoracic surgery. Patients under 20 and emergency cases were excluded. There were 151 males and 184 females, with a median age of 62 (22-87). No one has been diagnosed with TB before thoracic surgery in all cases. The Cut-off value of QFT test was 0.35IU/ml.

Results:

66 patients (19.2%) were positive in QFT test. There were no cases with QFT positive in 20 and 30 year old generations. There were 1 case in 40s, 1case in 50s, 23 cases in 60s, 34 cases in 70s, and 7 cases in 80s.

There were no cases with preoperative QFT test positive which was diagnosed with TB after surgery. But, there were two cases with preoperative QFT test negative which was diagnosed as TB after surgery.

Conclusion:

The QFT test is not suitable for TB screening before thoracic surgery.

O38-1

QUANTITATIVE ASSESSMENT FOR TWO-MONTHS PERIODIC TRAINING OF OFF-PUMP CORONARY ARTERY BYPASS ON A BEATING HEART SIMULATOR

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(Objective)
We quantitatively assessed quality of anastomosis and an effect of periodic training by using low-fidelity silicone rubber coronary artery models and computational fluid dynamics (CFD).
(Methods)
"Off-Pump hands-on seminar" was organized for 8 weeks period. Six cardiovascular residents who inexperienced clinical cases participated as volunteers. Five anastomosis were made in each single training. Each trainee did totally 40 anastomosis. Silicone-rubber-based vascular model and beating heart simulator was used at task station. The vascular model was developed ensuring both elasticity and tearing strength similar to human LAD. Elasticity of the model was adjusted to 0.117±0.027 MPa. The tearing strength was measured as 0.30 N durable enough comparing to porcine LAD 0.36±0.13 N. Beating heart rate was set at 60 bpm. An expert surgeon provided instructions at the seminar.
The evaluation was done by Micro CT and CFD process. Morphological assessment by Micro CT measured minimum cross-sectional area (CSA) in the anastomosis. The obtained morphological data was analyzed by CFD process to assess energy loss value by stenosis. In the CFD, steady flow at peak condition was employed which had been already validated to pulsatile conditions. The first and the last training outcomes were compared.
(Results)
All trainees' quality of anastomosis were improved through the hands-on training. CSA was increased from median 2.99 mm^2 (min 0.67 mm^2, max 9.48 mm^2) to median 6.80 mm^2 (min 4.08 mm^2, max 10.62 mm^2). Also energy loss value at anastomosis was declined from median 219 μW (min 52 μW, max 5,714 μW) to median 102 μW (min 42 μW, max 118 μW).
(Conclusions)
Quality of anastomosis could be assessed by energy loss value and CSA. Periodic seminar was effective for all trainees. Simulator and quantitative assessment system were found as powerful tools for residents' periodic training.

O38-2

SEVEN-YEAR ACTIVITY WITH 'WOMEN IN THORACIC SURGERY IN JAPAN'

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Objective: Number of woman surgeons in thoracic surgery area is on a rise in recent years, however, mentorship for those eager woman surgeons and related community have not been well established in many countries, and an achievement of their carrier often depends on the individual effort. This is a report on our seven-year activity with 'Women in Thoracic Surgery (WTS) in Japan', and sought to assess its recent role and issues to be improved. Summary of the activity: The annual meeting for 'WTS in Japan' has been held in conjunction to the annual meeting for the Japanese Association for Thoracic Surgery (JATS) since 2006 to 2012. The meetings were open to any people regardless of occupations and gender, and the information was forwarded to all the members of JATS either by paper-based mails or emails. Funding source consisted of participation fee, and grafts from JATS and Japan Medical Association. The meeting consisted of lectures and discussion among the participants as a morning or a luncheon session. The previous lecturers included 4 from Japan, 2 from USA, 1 from Thailand, and 1 from Singapore, seven of whom were woman surgeons presenting their personal carrier and/or the present status of mentorship among woman surgeons in their places. One male lecturer presented the results of survey on the status of care management for woman surgeons in Japan. The average number of attendee was 23 (13~50), and half of them were woman surgeons including the guests and 3 mediators. Conclusions: 'WTS in Japan' meetings have provided certain chances for the participants to share various experiences and role models. More effective methods of spreading this activity need to be considered so that this meeting will be utilized by more female thoracic surgeons in creating their carrier.

♥ O38-3

COST ANALYSIS OF CORONARY ARTERY BYPASS GRAFTING SURGERY AT THE NATIONAL UNIVERSITY HEALTH SYSTEM SINGAPORE BETWEEN APRIL 2010 AND MARCH 2011

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Background/Aim
This study is a cost analysis of Coronary Artery Bypass Grafting surgery (CABG) at the National University Heart Centre (NUHC) for the fiscal year of April 2010 to March 2011. We aim to investigate if there were statistically significant cost differences between defined patient categories, identify the peri-operative period where this was the case, as well as the service group billing category.

Methodology
The study retrospectively analysed the in-hospital cost incurred in the fiscal year starting April 1, 2010 till March 31, 2011, during which 420 patients underwent CABG. All patients were included in the study. Financial data of the in-hospital costs incurred was obtained from the NUHS financial department. Patients were analysed according to three sets of distinct categories: private/subsidised, elective/emergency, complications/no-complications. The itemized cost categories were studied under pre-operative, intra-operative and post-operative time periods. Descriptive statistical studies were performed using the SPSS 20.0 software, which compared the financial cost differences in detail.

Results
Private/subsidised
Intra-operative cost was the only statistically significant variable; private patients incurred greater cost (p value < 0.05).

Elective/emergency
Statistically significant differences were found in pre-operative costs as well as post-operative costs (p value < 0.05); emergency patients incurred greater cost.

Complications/no complications
Pre-operative, intra-operative, and post-operative costs were variables with statistically significant differences in these 2 groups of patients (p value < 0.05); patients with complications incurred greater cost.

Conclusion
In conclusion, this study found statistically significant differences in the total cost when comparing the distinct patient categories. The peri-operative periods (pre-, intra- or post-operative) and itemized cost categories during which the cost differences were incurred were also identified. These results have provided us with the platform to analyse the role of patient co-morbidities and other intrinsic factors in relation to hospitalization cost.

♥ : Travel Grant

O38-4

ACUITY ADAPTABLE PATIENT CARE UNIT SYSTEM SHORTENS LENGTH OF STAY AND IMPROVES OUTCOMES IN ADULT CARDIAC SURGERY

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OBJECTIVE: Acuity Adaptable Patient Care Unit (AACU) system allows all beds within a nursing unit negate the need for transfer with changes patient status. The unit is specialty specific for all levels of patient care. This system was implemented in March 2006 for cardiothoracic surgery at our institution. The purpose of this study is to evaluate the impact of AACU system on the outcomes after adult cardiac surgery. METHOD: We retrospectively reviewed 2930 consecutive patients who underwent major adult cardiac procedures between January 2003 and December 2010. The cohorts were divided into the pre-AACU group (January 2003 to February 2006, n=1029) and the AACU group (March 2006 to December 2010, n=1901). Patient demographics and post-operative outcomes were assessed. RESULTS: The proportion of coronary artery bypass grafting was significantly lower (pre-AACU vs AACU: 43 vs 35%, p<0.01) and those of aortic procedure (4 vs 11%, p<0.01), and mechanical assist device insertion (3 vs 5%, p=0.02) were higher in the AACU group. After the implementation of AACU system, the incidence of all complications defined by The Society of Thoracic Surgeons (STS) database (49 vs 34%, p<0.01), the median length of Intensive Care Unit (ICU) stay (49 [interquartile range, 27-99] vs 26 [19-45] hours, p<0.01), that of hospital stay (6 [4-10] vs 5 [4-7] days, p<0.01), and the readmission rate of ICU (5 vs 2% p<0.01) were significantly decreased. Significant reductions in hospital mortality and the rate of hospital readmission <30-day were not observed. CONCLUSIONS: The implementation of AACU system has improved the outcomes after major cardiac procedures. The incidence of post-operative complications and length of stay have all decreased significantly without increasing readmission rate. AACU creates a system of fluid care with specialty trained nursing and other ancillary support that expedites discharge and improves overall patient outcomes.

O38-5

CARDIAC SURGERY IN ADULT JEHOVAH'S WITNESS PATIENTS

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Objectives : Cardiac surgery in Jenovah's witness patients has many limitations because of refusal of blood transfusion. We evaluated perioperative outcomes of cardiac surgery with cardiopulmonary bypass in adult patients.

Methods : From July 2001 to July 2012, 65 adult Jehovah's witness patients underwent 66 cardiac surgeries with cardiopulmonary bypass without blood transfusion. We have conducted the blood conservative program including preoperative, intraoperative and postoperative managements. We reviewed perioperative clinical outcomes, and determined independent risk factors for postoperative morbidity and mortality.

Results : The median age was 50.5 years. There were two emergent operations and five redo-operations. The operative mortality was 4.5% (n = 3). Cardiac surgeries included ASD (n = 7), VSD (n = 6), valve replacement (n = 25), valve repair (n = 9), CABG (n = 11), myxoma removal (n = 3), aortic root replacement (n = 1), ascending aorta replacement (n = 2), and others (n = 2). Postoperative values of hematocrit (35.5%) and hemoglobin (11.8g/dl) were significantly lower than preoperative values of hematocrit (38.9%) and hemoglobin (13.0g/dl) ($p < 0.000$). The mean value of lowest hematocrit during cardiopulmonary bypass was 22.9% ± 3.4%. Postoperative complications included acute renal insufficiency (n = 3), mediastinitis (n = 2), LV dysfunction (n = 2), arrhythmia (n = 2), postoperative bleeding control (n = 1), intracranial hemorrhage (n = 1), and others. In multivariate logistic regression analysis, previous operation (odds ratio, 1,476.85; $p = 0.011$) and difference of preoperative and postoperative ejection fraction (OR, 1.43; $p = 0.027$) were identified as significant independent risk factors for postoperative complications. Emergent operation (OR, 187.67; $p = 0.037$) was a significant predictor of operative mortality.

Conclusions : Under well-designed blood conservative program, perioperative hemotologic values seems not to be related to perioperative morbidity and mortality in adult Jenovah's witness patients.

O38-6

CIRCUMFERENTIAL SUCTION-ASSISTED LIPECTOMY FOR REFRACTORY LYMPHEDEMA OF THE LEGS (CSAL): A PROSPECTIVE STUDY IN 60 PATIENTS

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Background: The incidence of secondary lower limb lymphedema ranges from 40 to 60% in patients who underwent radical inguinal or para-iliac dissection with ambulant radiation therapy. Primary lymphedema of the leg has a prevalence ranging from 1/100.000 to 8/100. Although most patients can be treated by conventional non-operative means with satisfying results, end-stage irreversible lymphedema is often non-responsive to compression therapy. In these cases fibrosis and adipose tissue hypertrophy limits the outcome of conservative multi-disciplinary Decongestive Lymphatic Therapy.
Objectives: To elucidate the long term follow-up results of Circumferential Suction-Assisted Lipectomy (CSAL) in end-stage irreversible lymphedema of the leg.

Methods: This was a prospective study of 60 patients with chronic irreversible lymphedema of the leg. After initial conservative treatment CSAL was used to reduce excess volume. Compression was resumed directly after surgery with short-stretch bandages, followed by flat-knit compression garments. Leg volumes were measured pre- and postoperatively, after 1, 3, 6 and 12 months.

Results: The mean preoperative lymphedema volume was 4166 ml (IQR: 2863; 6820 ml). The mean aspirate volume during CSAL was 6760 ml containing 74 per cent adipose tissue. After 12 months, the mean reduction in lymphedema volume was 93 per cent.

Conclusion: Circumferential suction-assisted lipectomy combined with a multi-disciplinary approach including pre- and postoperative compression therapy and lifelong wearing of compression garments is an effective technique in the treatment of irreversible lymphedema of the leg.

O39-1

MITRAL VALVE REPAIR IN ACTIVE INFECTIVE ENDOCARDITIS

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Objective: For patients with mitral valve infective endocarditis (IE), mitral valve repair (MVP) is preferred over mitral valve replacement(MVR). The objective of this study is to investigate the limitation of mitral valve repair for active IE by reviewing our recent surgical interventions for active mitral valve IE.

Method: Between January 2004 and August 2012, there were 24 patients who underwent mitral valve surgical interventions. The mean age was 60 ±16 years. The type of active IE was classified into four groups according to the severity of mitral valve destruction and the surgical maneuvers were selected for each group. I: Vegetation with less destructive leaflets and subvalvular apparatus-debridement by rubbing and ring annuloplasty. II: One localized lesion -resection/suture. III: Two or more destructive lesions - resection/suture or patch augmentation with artificial chordae. IV: Destruction extending over annular lesion-reconstruction of annuli with pericardial patch. We estimated the surgical outcomes of these patients with a focus on the validity of MVP for active IE.

Results: A total of 21 patients (87.5%) underwent MVP and 3 patients underwent MVR. The surgical outcomes showed satisfactory to both procedures. There was no late death and no recurrence of IE. The patients who underwent MVR belonged to the type III (2pts) or IV (1pt) and the early cases in this study.

Conclusions: MVP for active IE is a useful maneuver and could be achieved with radical resection of infective potions and covering a defect with pericardial patch, supporting by artificial chordae for most cases. In cases of a wide range of invasion or destruction which should be resected, more complex procedures were needed as might be expected. Therefore, early surgical intervention should be considered to achieve MVP which shows a better survival.

♥ O39-2

DELAYED SURGERY IN ACTIVE INFECTIVE ENDOCARDITIS: IS IT REALLY ASSOCIATED WITH WORSE OUTCOMES?

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OBJECTIVES: Decision on timing of surgery is crucial to successful treatment of infective endocarditis. Better outcomes with early surgery have been demonstrated in previous reports and incorporated in various guidelines. However, it might not be possible in reality to adhere strictly to the guidelines. This study explores the results of surgery that has been delayed longer than recommendation.

METHODS: From Jan 2006 to Dec 2011, 88 Patients who underwent heart valve surgery because of active, left-sided, native-valve endocarditis were retrospectively reviewed. They were divided into standard group (n=38) and delayed group (n=50) based on indications and timing of surgery that were recommended by ESC guidelines. Preoperative characteristics, microbiology, operative details, postoperative courses, and mid-term results were compared.

RESULTS: Patients' characteristics were similar between groups. Large number of patients had NYHA class IV (50% vs 58%), severe renal dysfunction (38.5% vs 36%), respiratory failure (23.7% vs 30%), and inotropic support (36.8% vs 58%). EuroSCORE II is not different (9.6±1.3% vs 11.2±1.1%). Causative organism could not be identified in 42% of patients while 39.7% were Streptococci. Severe AR and MR presented in 85.2% and 25%. Delayed group had more periannular extension (13.2% vs 50%, p=0.001). Duration of preoperative stay was longer in delayed group (10.7±8.6 days vs 18.8±13.9 days, p<0.001) but operative procedures, and cardiopulmonary bypass time were similar. Operative mortality tended to be higher in delayed group (2.6% vs 16%, p=0.072) while 7-yr survival rates were comparable (81.6% vs 76.1%, p=0.310). Delayed surgery does not associate with increased mortality from multivariate analysis (hazard ratio 1.3, 95%CI 0.4-3.9, p=0.628).

CONCLUSIONS: Delayed timing of surgery may be acceptable in selected group of patients and yields comparable operative results and mid-term survival. However, as the standard group shows trend towards better outcomes, guidelines' recommendation should be followed as much as possible.

♥ : Travel Grant

O39-3

INFECTIVE ENDOCARDITIS WITH CEREBRAL COMPLICATIONS: CAN AN ALGORITHM FOR TREATMENT BE APPLIED?

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Background: Management of patients with infective endocarditis is challenging, particularly when the disease is complicated by neurological deficits. No clear management guidelines have been defined and the timing of surgery remains controversial. We developed management algorithm for patients having infective endocarditis. The aim of this study is to evaluate our algorithm.

Patients and Methods: Between January 2002 and April 2012, 38 adult patients with left-sided infective endocarditis underwent valve surgery. Before operation, enhanced brain CT was performed to rule out cerebral complication except for emergency cases. Pre- and postoperative data were retrospectively reviewed to clarify whether the algorithm was effective.

Results: Among 38 patients with infective endocarditis, 16 (42.1%) experienced neurological complication. Mean interval from onset of neurological dysfunction to cardiac operation was 27.8 ± 27.8 days (median 23 days). Of the 16 patients, 12 experienced cerebral infarction. Mass effects were seen in 3 patients, with 1 of these 3 patients falling out from the management algorithm. This patient died following aneurysm rupture. Mycotic aneurysm was detected in 4 patients, with 3 undergoing successful staged operations. Mortality and postoperative neurological exacerbation in cerebrovascular complication group was 6.3% (1 patient). Most patients who fulfilled the algorithm showed good outcomes.

Conclusions: Our suggested management algorithm for infective endocarditis appears effective. A prospective study with a large study population is necessary to evaluate the optimal timing of surgery.

O39-4

LONG-TERM OUTCOME OF CARDIAC SURGERY FOR INFECTIVE ENDOCARDITIS

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OBJECTIVE: Currently, Infective Endocarditis (IE) remain fatal disease if treatment is not successful, despite the advancement of antibiotics and operative procedures. In our institution, we have undergone cardiac surgery in active phase of infection if the patients had such a risk factor as cardiac heart failure, resistant infection and the risk of septic embolism. And we have undergone cardiac surgery in healed phase after 4 to 6 weeks antibiotics therapy if patients did'nt have risks as above. In this study, we reviewed the the results retrospectively.

METHODS: We underwent cardiac surgery of 32 cases (n=19 cases in active phase, group A and n=13 cases in healed phase) for IE during 2003 and 2012. Statistical analysis was about survival rates, freedom from major adverse cardiac event (MACE) between both groups and perioperative risk factors including cardiac failure, septic embolism, bacterial species, prosthetic valvular infection, duration between diagnosis and operation, gender and age among all cases using standard univariate, survival and regression methods.

RESULTS: Operative motality was 0%. Overall survival rate was 87.5% at average follow up 45months. Survival rates and freedom from MACE were 76%, 84.2% in group A and 100%, 100% in group B at 5 years after surgery respectively (log lank; P=0.11 and P=0.14). Only age was significant risk factor regarding survival rate and freedom from MACE (P<0.05). Duration between diagnosis and operation was not significant, but longer duration tended to affect better survival rate (P=0.05).

CONCLUSION: Our overall outcomes of active IE were acceptable. We were not able to detect the significant risk factors of survival rate and free from MACE other than age. However, the fact that there were mortality and MACE cases in only group A would lead to the suggestion that the reactivity for preoperative infection control is important.

O39-5

INFECTIVE ENDOCARDITIS OF TRICUSPID VALVE: REPAIR WITH AUTO(XENO)PERICARDIUM AND NEOCHORDAE IN CANDIDATES TO VALVE REPLACEMENT

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OBJECTIVE: Tricuspid valve(TV) endocarditis traditionally has been treated with various surgical techniques such as reconstruction(TVR), TV replacement(TVRp), TV excision. The aim of our study is assessment of early and intermediate results of TV reconstruction by using new technique.

METHODS: The TV reconstruction was performed in 65 patients with active IE of TV (mean age, 32.5 ± 15.5) between 2001 and 2011. Standart techniques such as partial resection, patch repair, chordae translocation were used for 44 patients.We have started novel approach to restoration of TV for candidates for replacement since 2008. We have used rags of auto(xeno)pericardium with formation of neochordae loops(Gore-Tex) and PTFE band annuloplasty for 21 patients. We have used autopericardium for partial or total replacement of leaflet(s) in 15 cases and xenopericardium in 6 cases. Premeasured multiple PTFE loops secured to the papillary muscle, other side of loop was fixed to the free margin of new leaflet or to native cusp. We have used PTFE bands(5sm) for stabilization of the annulus in 15 cases, in 3 rigid rings, and autopericardium(5sm) for another 3 .

RESULTS: The hospital mortality was 4% (1 patient). There was no incidence of valve-related events and reinfection. All patients were in NYHA FC 1. All of them were in sinus rhytm without of disturbance of AV-conduction. There were not any residual leaks founded in cases of 11 patients. Eight patients were presented with TV regurgitation grade I , and 2 with grade 2.

CONCLUSIONS: The results of our study demonstrate that in cases of severe IE of TV, the restoration of the function of TV is an effective as well reproducible method of surgical correction. Also, it depends от intravenous drug abuse, that causes additional problems. The behaviour of pericardium in long-term period is uncertain and the assessment of long-term results is required.

O39-6

RESULTS OF SURGICAL INTERVENTION FOR AORTIC VALVE INFECTIOUS ENDOCARDITIS WITH ANNULAR ABSCESS

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(Objective)

Aortic valve infectious endocarditis with an annular abscess is a fatal clinical situation. The expanded inflammation often leads destruction of important structures surrounding aortic root. Surgical treatments for those cases are usually complex and challenging. The aim of this study is to examine of the outcome of surgery for infected aortic valve endocarditis coexisted annular abscess.

(Methods)

From January 1991 to December 2011, 30 consecutive patients had surgery for active aortic valve endocarditis with annular abscess. Patients' mean age was 57 years and 70% were men. Sixteen patients (53%) had prosthetic valve endocarditis and 5 patients among them had had Bentall procedure. Fourteen patients (47%) were in New York Heart Association functional class III or IV. Urgent or emergent operation was performed in 22 (73%). *Staphylococci* were the most frequent offending microorganism. Surgery included radical resection of the abscess cavity for all patients. Aortic valve replacement (AVR) was simply performed in 3 patients. AVR combined annular reconstruction with heterogeneous pericardial patches was performed in 17 patients. For the 10 patients who had aortic-left ventricular discontinuity, aortic root reconstruction was performed.

(Results)

There were 4 operative deaths (13.3%). In 3 among them, methicillin-resistant *staphylococcus aureus* (MRSA) was the causative microorganism. The mean follow up was 79 ± 44 months. In 4 patients, re-operation was necessary for recurrent or persistent infectious endocarditis in early or late postoperative period. The actual survival excluding operative deaths were 100 % at 5 years. Two late deaths were seen more after.

(Conclusions)

Radical debridement of the abscess and reconstruction of aortic root resulted in favorable outcomes in surgical intervention for aortic valve infectious endocarditis with annular abscess. Operative result was poor in patients suffered from MRSA. Since recurrence of infection can be seen in the late term, careful follow-up is necessary.

O39-7

AORTIC VALVE RECONSTRUCTION USING GLUTARALDEHYDE-TREATED AUTOLOGOUS PERICARDIUM AS SURGICAL TREATMENT OF INFECTIVE ENDOCARDITIS

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Objective: Usage of foreign body implantation should ideally be avoided for aortic valve surgery with infective endocarditis. The experience of our original aortic valve reconstruction using glutaraldehyde-treated autologous pericardium for infective endocarditis is reported.

Methods: Original aortic valve reconstruction had been done for 462 patients from April 2007 through March 2012. Among them, 12 patients had native aortic valve endocarditis, and 2 patients had prosthetic valve endocarditis in aortic valve position. Mean age was 63.4±10.5 years old. Pre-operative surgical annular diameter was 20.3±3.6 mm. First in the procedure, harvested pericardium is treated with 0.6% glutaraldehyde solution. After resecting cusps, we measure the distance between commissure with original sizing instrument. Then, pericardium is trimmed with original template. Three cusps are sutured to each annulus. To prevent recurrence of infection, we injected the vancomycin solution to the annular tissue and applied gentian violet to the surface of annulus. For the cases of prosthetic valve endocarditis, we used bovine pericardium instead of autologous pericardium.

Results: There was no operative mortality or re-operation. With the mean follow-up of 30.0±13.5 months, no recurrence of infection was noticed. Post-operative valve function had been inspected by echocardiography 1 week, 1 month, 3 months, and every 6 months after surgery. Echocardiography revealed less than mild aortic regurgitation for all patients and peak pressure gradient averaged 13.3±6.1 mmHg.

Conclusions: Original aortic valve reconstruction had been performed for aortic valve disease due to infective endocarditis with excellent early results. Since this procedure does not need to use foreign body, it has a possibility to be a treatment of choice for the case with infective endocarditis.

O39-8

APPLICATION OF "ELEPHANT-TRUNK" TECHNIQUE FOR RECONSTRUCTION OF AORTIC ANNULAR EROSION AFTER REPEATED AORTIC ROOT SURGERY

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OBJECTIVE:

Aortic root/valve endocarditis sometimes requires repeated valve replacement due to the repeated infection. Aortic annular erosion would lead the difficulty in reconstruction of the root. We applied the technique of "elephant-trunk" to reconstruct the destructed root and relocate the artificial valve.

METHODS:

The aorta was transversely transected after cardiac arrest was achieved. After debridement of the infected or unsteady/leaking valve that as previously implanted, the coronary artery buttons were mobilized if feasible. A Hemashield graft (28 or 30 mm) was chosen after sizing the aortic root. A short segment of the graft was inverted into the left ventricle and it was sutured to the left ventricle wall and part of aortic wall (the area of non-coronary cuspid). Then the graft was everted from LVOT and was trimmed to a proper length. The proper xenograft/mechanical valve was suture to another graft with 1-cm skirt for better anastomosis and hemostasis. The coronary arteries were reimplanted to the graft with a short vascular graft as extension.

RESULTS:

We have encountered two cases of repeated aortic root endocarditis with aortic annular erosion. They all suffered from two times of aortic valve replacement/Bentall's procedure before applying the technique. Both of them were found dehiscence of aortic-mitral continuity. They all survived without complication though they were operated emergently. In spite that the cross-clamp duration was relative long (240 and 255 min), no mechanical support was required postoperative. The delayed sternal closure was performed 2 days later. Antibiotic was used for at least 6 weeks. Unfortunately one patient died suddenly 18 months later at home and the cause was unknown.

CONCLUSIONS:

"Elephant-trunk" technique can be applied in the LVOT for preparing a better and easy suture zone for complex aortic root endocarditis if the size is suitable.

♥ O39-9

SUBACUTE AORTIC VALVE INFECTIVE ENDOCARDITIS COMPLICATED BY ACUTE MYOCARDIAL INFARCTION WITH NORMAL CORONARY ANGIOGRAM

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Myocardial infarction (MI) in infective endocarditis (IE) potentially fatal due to its acute presentation but is frequently overlooked. We report a patient with infective endocarditis complicated by NSTEMI with a normal coronary angiogram.

Our patient is a 60-year-old Chinese gentleman with one-week history of fever and productive cough. Clinical examination revealed an early diastolic murmur over the aortic area. Methicillin-susceptible Staphylococcus aureus was detected in blood cultures. Intravenous antibiotics was started. Transthoracic and trans-esophageal echocardiogram revealed a tricuspid aortic valve with prolapsed right coronary cusp, severe regurgitation with presence of small string-like mobile masses attached to the right coronary cusp, secundum atrial septal defect and mild tricuspid valve regurgitation. He developed sudden onset angina pectoris, associated with ST segment depression on electrocardiogram and elevated cardiac enzymes. Coronary angiogram showed normal coronary arteries. He underwent surgical aortic valve replacement, tricuspid valve annuloplasty and closure of patent foramen ovale. Post-operative trans-thoracic echocardiogram was satisfactory.

Infective endocarditis complicated by acute MI can be due to various reasons, the most common being coronary embolism of the vegetation. Other possibilities include peri-annular complications, pre-existing arteriosclerotic coronary lesions with reduced cardiac reserves due to aortic regurgitation and rarely temporary obstruction of the coronary ostium by large mobile vegetations. Patients with acute MI in infective endocarditis usually present with sudden onset chest pain with ST segment changes on ECG. Patients with coronary embolism are usually acutely ill due to the lack of collateral myocardial blood supply. It has been reported that it is difficult to reach a clinical diagnosis of coronary embolism due to the natural history of coronary emboli and the limitations of coronary angiography. Evidence reveals that adopting the current strategies (thrombolysis and percutaneous coronary intervention) used in the treatment of myocardial infarction for septic vegetation embolisation can be dangerous.

♥ : Travel Grant

O40-1

CARDIAC STEM CELL TRANSPLANTATION: THE ALCADIA (AUTOLOGOUS HUMAN CARDIAC-DERIVED STEM CELL TO TREAT ISCHEMIC CARDIOMYOPATHY)

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OBJECTIVE: Cardiac-derived stem cell (CSCs) have a great potential to ameliorate cardiac function damaged by ischemic injury. The aim of this study is to evaluate the safety and preliminary efficacy on the transplantation of autologous CSC with controlled release of basic fibroblast growth factor (bFGF). METHODS: We conducted Phase I trial for 6 ischemic cardiomyopathy (ICM) patients with severe left ventricular (LV) dysfunction (ejection fraction (EF); from 35% to 15%), who would be scheduled to receive coronary artery bypass grafting (CABG). Following expansion of CSCs from cardiac endomyocardial-biopsy, patients were implanted CSCs (0.5million cells/kg) into the viable myocardium around the infarcted area and overlaid gelatin-hydrogel incorporating with bFGF (200 ug) onto it. Simultaneously, on-pump beating CABG was carried out with complete revascularization. In order to elucidate the efficacy of the regenerative procedure more clearly, matched pair analysis between the clinical trial case and cases registered in Japan Adult Cardiovascular Surgery Database (JACVSD) will be planned. Based on expected mortality adopted in JACVSD, 4 cases registered in JACVSD each trial case were selected, and their 1 year-follow up data were collected. This trial is registered under Clinical Trials.gov (NCT00981006). RESULTS: One cardiovascular event has been identified in following for 6month. NYHA functional class of enrolled 5 patients were improved from 3.6+/-0.5 to 1.6+/-0.5, which were associated with the significantly improvement of peak-Vo2 (from 12.7+/-2.7 to 16.7+/-3.3 ml/kg/min, p=0.0308). LV dysfunction in patients was significantly improved 9.8+/-5.1% of LVEF (from 26.0+/-6.1 to 35.8+/-8.9%, p=0.013), which were accompanied with an improvement in global wall motion score (from 17.2+/-3.1 to 6.6+/-3.8%, p=0.0013) and downward tendency of infarct size. CONCLUSIONS: Our findings are that the transplantation of CSCs with controlled release of bFGF is safe and feasible for ICM patients with LV dysfunction, and may have a potential to lead injured heart to functional repair.

O40-2

FACTORS-BASED HUMAN CARDIOMYOCYTES DIFFERENTIATION EXHIBITS INCOMPLETE MATURATION AND EXCITATION THROUGH ABERRANT CALCIUM HANDLING PROTEINS

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Background: Recent breakthrough in direct cardiac reprogramming in mice provided a new strategy for cardiac regeneration; however, whether this can be translated in human remains uncertain. Here, we investigate the role of calcium-dependent cardiac maturation during the process of factors-based human cardiomyocytes differentiation. **Methods and Results**: Human cardiac progenitor cells (CPCs) were isolated and transduced with lentiviral vectors encoding GATA4, Mef2C, and Tbx5 (GMT). Differentiated cardiomyocytes were identified by alpha-MHC promoter-driven reporter gene and mitochondrial-labeling fluorescence. Calcium oscillation imaging, FACS analysis using signal-regulatory protein alpha (SIRPA), and cardiac structural as well as ion channel regulatory proteins were examined to verify cardiac maturation. We found that GMT transduction in CPCs gave rise to substantial cardiomyocytes addressed by a significantly augmented SIRPA and mitochondrial expressing cell population. Those were confirmed by immunostaining of alpha-actinin and cTnT; however, FACS analysis showed that cardiomyocytes expressing alpha-actinin and cTnT were modest. Spontaneous calcium oscillation was identified in undifferentiated CPCs. However, this activity was suppressed after GMT induction. Electrical stimulation had no effects on calcium oscillation in GMT-induced CPCs. GMT induction markedly up-regulated the expressions of sodium and potassium ion channels modulators including SCN5A, Kir2.2, HERG, KvLQT1, and Kv4.3, On the other hand, GMT induction induced only partial up-regulation of calcium ion channels. Although, the expression of ryanodine receptors and L-type calcium-channel alpha 1C were significantly up-regulated, those of sarcolemmal calcium-cycling regulatory proteins, NCX1, SERCA2, and inositol 1,4,5-triphosphate receptors were down-regulated during the process. Cyclic mechanical stretch redirected a subset of GMT-treated CPCs with markedly increased TGF-beta and IGF-1 expressions, but these factors could partially restore the calcium handling properties during differentiation. **Conclusions**: Our data suggest that factors-based cardiac-lineage induction in human CPCs has critical deficits towards functional maturation and excitation, consistent with a repression in calcium handling proteins necessary to complete the processes.

O40-3

THE TRANSPLANTATION OF HUMAN iPS CELL-DERIVED CARDIAC CELL SHEETS TO RAT MYOCARDIAL INFARCTION MODEL AMELIORATES CARDIAC DYSFUNCTION THROUGH NEOVASCULARIZATION

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OBJECTIVE: To realize cardiac regeneration using human induced pluripotent stem cells (hiPSCs), efficient differentiation to defined cardiac populations (cardiomyocytes [CMs]/ endothelial cells [ECs]/ vascular mural cells [MCs]), and transplantation technique for fair engraftment are required. Recently, we reported that mouse ES cell-derived cardiac cell sheet transplantation to rat myocardial infarction(MI) model ameliorated cardiac dysfunction (*Stem Cells*, 2012). Here we tried to extend this strategy to hiPSCs. METHODS: We have reported an efficient CM differentiation protocol from hiPSCs (*PLoS One*, 2011). In this study, we further modified the protocol to induce vascular cells (ECs/MCs) together with CMs by vascular endothelial cell growth factor supplementation. RESULTS: This modification resulted in proportional differentiation of $cTnT^+$-CMs (60.6±12.4% of total cells), VE-$cadherin^+$-ECs (7.7±4.7%) and $PDGFR\beta^+$-MCs (17.7±11.2%) at differentiation day 15 (n=15). Then, these cells were transferred onto temperature-responsive culture dishes (UpCell; CellSeed, Tokyo, Japan) to form cardiac cell sheets. After 4 days of culture, we successfully collected self-pulsating sheets with 7.6×10^5±2.6 (n=15) of cells containing CMs (48.8±14.6% of total cells), ECs (3.9±3.5%), and MCs (23.3±17.2%). Multichannel extracellular potential analysis revealed that the cardiac tissue sheets hold unidirectional and regular electrical propagation, with no ectopic foci(MED 64 system). A regular calcium transient was observed throughout the sheet along with spontaneous beating. The cell sheets were transplanted to a sub-acute MI rat heart. In transplantation group, echocardiogram showed a significant improvement of systolic function of left ventricle (fractional shortening: 22.5±4.8 vs 36.2±7.8%, $p<0.001$, n=24) (pre-treatment vs 4-weeks after transplantation). We confirmed a prominent accumulation of vWF^+/HNA^- endogenous ECs around the graft after transplantation, indicating angiogenic effects mediated by the sheet. CONCLUSIONS: Transplantation of cell sheets with hiPSC-derived defined cardiac populations ameliorates cardiac dysfunction after MI. Thus, we developed a valuable technological basis for hiPSC-based cardiac cell therapy.

O40-4

ENHANCED NEOVASCULARIZATION MEDIATED BY VEGF-LOADED PEGYLATED FIBRINOGEN HYDROGEL IN A RODENT MYOCARDIAL INFARCTION MODEL

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OBJECTIVE
Angiogenic therapy is a promising approach for repair and regeneration of the ischemic myocardium. Various approaches have been done to improve blood flow including the use of vascular endothelial growth factor (VEGF). However, direct bolus VEGF delivery has limited therapeutic potential due to lack of sustainable release. In this study, we utilized a biosynthetic scaffold comprising of fibrinogen backbone crosslinked with polyethylene glycol (PEG) as a delivery matrix for VEGF and explored its potential in inducing neovascularization in myocardial infarction model.

METHODS
PEG-fibrinogen (PF) hydrogels were synthesized with their properties analyzed. VEGF was incorporated and its release kinetics was studied. Acute myocardial infarction was generated in rodent models and the animals were randomly assigned to 4 groups; sham, saline, PF and PF-VEGF (n=10 each group). Total volume of 150µl of either saline or hydrogel was injected in infarct and peri-infarct areas of the myocardium. The animals were monitored for 4 weeks and myocardial function was assessed using echocardiography. Myocardial tissue samples were harvested for Hematoxylin & Eosin, Masson Trichrome and α-smooth muscle actin staining to assess the extent of fibrotic scar and arteriogenesis.

RESULTS
PF-VEGF hydrogels showed a sustained slow release over 30 days. Highest degree of cardiac muscle preservation was observed in PF-VEGF-treated animals. PF-VEGF-treated animals showed the best improvement in ejection fraction (PF-VEGF=74.68%±4.23, PF=64.15%±2.64, saline=41.86%±7.32), left ventricular internal dimensions, end-systolic and end-diastolic volumes. Higher degree of arteriogenesis was seen in animals treated with PF-VEGF hydrogels (Infarct area: PF-VEGF=33.3±6.75, PF=18.1±3.80, saline=8.29±2.87; Peri-infarct area: PF-VEGF=10.8±2.78, PF=8.2±1.91, saline=3.83±1.27 blood vessels/200x magnification field, $p<0.05$).

CONCLUSION
This study demonstrated that PF hydrogel is a suitable and efficient matrix for VEGF delivery in restoring the ischemic myocardium. In addition to providing mechanical support, PF-VEGF provided a sustained and controlled release of VEGF in the ischemic tissue resulting in improved neovascularization and cardiac function.

O40-5

NOVEL APPROACH TO REDUCE SYSTEMIC INFLAMMATION AND LUNG INJURY FOLLOWING PROLONGED CARDIOPULMONARY BYPASS USING ALLOGENEIC ADMINISTRATION OF FETAL MEMBRANE-DERIVED MESENCHYMAL STEM CELLS IN RATS

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Background

Systemic inflammation after prolonged cardiopulmonary bypass (CPB) often causes serious multi-organ system dysfunction. Mesenchymal stem cells (MSCs) are reported to reduce inflammation and attenuate cell-mediated immune response. We have focused on fetal membrane (FM) as an alternative source of MSCs to provide a large number of cells and previously reported allogeneic administration of FM-MSCs attenuate autoimmune myocarditis and glomerulonephritis. The aim of this study was to investigate whether allogeneic FM-MSCs attenuate systemic inflammatory response and lung injury in a rat CPB model.

Methods and Results

Male Lewis rats (MHC haplotype: RT-1l) were randomly divided into three groups (n=7 each): cannulation alone (Sham group), CPB alone (Control group) and CPB+MSC (MSC group). Experimental rat CPB model was established by arterial infusion through left femoral artery and venous drainage through right jugular vein into the right atrium, and the flow rate was adjusted to 50ml/kg/min and maintained for 30 minutes. In the MSC group, MSCs (1×10^6 cells) derived from FM of ACI rats (MHC haplotype: RT-1a) were injected before CPB initiation intravenously. One hour after CPB, serum concentrations of tumor necrosis factor-α (TNF-α) and interleukin (IL)-6 in the MSC group were significantly lower compared to the Control group(Control group vs. MSC group; TNF-α: 7.68 ± 1.33 ng/ml vs. 3.18 ± 0.53 ng/ml, $p<0.01$, IL-6: 17.07 ± 1.15 ng/ml vs. 10.3 ± 1.97 ng/ml, $p<0.01$). Similarly, mRNA expression of proinflammatory cytokines including TNF-α and IL-6 in the lung and spleen were lower in the MSC group. Allogeneic administration of FM-MSCs remarkably decreased the lung injury score, protected alveolar structure, and inhibited neutrophil infiltration to the lung interstitium.

Conclusion

Allogeneic transplantation of FM-MSCs might be an innovative strategy to prevent CPB-induced severe systemic inflammation and lung injury by suppressing the expression of inflammatory cytokines.

O41-1

CIRCARDIAN VARIATION OF MOTOR CURRENT COULD BE OBSERVED IN FIXED ROTATION SPEED CENTRIFUGAL-CONTINUOUS FLOW LEFT VENTRICULAR ASSIST DEVICE SUPPORT

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OBJECTIVE

The algorism for physiological control has been controversial in the patients supported with continuous flow LVAD, in which supplied blood flow is regulated by the pressure gradient between aortic and left ventricular pressure when operated at constant rotation speed. Little has known relating physiological control algorism, such as achieving physiological circardian rhythm. To determine the existence of circadian variation, we retrospectively evaluated the motor current of dilated cardiomyopathy patients supported with centrifugal-continuous flow LVAD.

METHODS

The motor speed (rpm) and electric current (micro ampere) data were collected every 10 minutes after device implantation and were divided in every 30 days data.

RESULTS

Six patients, supported by EVAHEART centrifugal continuous flow LVAD for more than 2 years, were 37.3 ± 14.8 years old and weighed 63.8 ± 15.1 kg at the time of operation. As of December 1, 2012, mean support duration was 1472.8 days (968 - 2266 days). The mean calculated periods of the circardian variation was 23.95 ± 0.91 hours and the mean amplitude was 11.55 ± 4.38 μA. The circardian variation of the motor current was tended to be relatively low during night time and high during day time. There were significant night and day time variation ($P<0.01$). The amplitude of the motor current became maximum in the fourth month and was significantly greater in fourth month than first month ($P<0.05$).

CONCLUSIONS

Circardian rhythm of motor current could be observed in fixed rotation speed centrifugal-continuous flow LVAD support. The cause and effect of this variation are still unclear although this is speculated to be correlated to physiological changes of some hemodynamic related parameters of patients.

O41-2

LEFT VENTRICULAR ASSIST DEVICE PLACEMENT FOR OBESE PATIENTS

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OBJECTIVE:

To evaluate our experience in left ventricular assist device (LVAD) placement in obese patients.

METHODS:

We retrospectively reviewed 148 consecutive patients who underwent LVAD placement at our institution from Aug 2003 to Sep 2012. The cohort was divided into the non-obese (body mass index [BMI]<30, n=89) and the obese (BMI>=30, n=59) groups. Demographics and outcomes were assessed.

RESULTS:

The mean weight and BMI were 79 (non-obese) vs. 106 kg (obese) and 25 vs. 34 kg/m2, respectively. Patient age, diagnosis, cardiac, pulmonary and renal functions, and device type did not differ between the groups. However, obese patients had higher prevalence of diabetes (58 vs. 38%, p=0.02), preoperative cereberovascular accident (14 vs. 3%, p=0.03), and more destination therapy (37 vs 16%, p<0.01). Length of hospital stay (11 vs. 10 days, p=0.59), reoperation (6 vs. 7%, p=0.77), and length of device support (184 vs. 164 days, p=0.44) were similar in non-obese vs. obese patients. However, obese patients had higher incidence of VAD infection (29 vs. 14%, p=0.02), sepsis (17 vs. 6%, p=0.03), and VAD failure (25 vs. 12%, p=0.04). Patient survival was similar in the groups (post-LVAD 30-day, 1- and 2-year survival rates; non-obese: 96, 80, and 63% vs. obese: 97, 79, and 64%, respectively, p=0.50). However, 2/4 (50%) severely obese (BMI >40%) LVAD patients required LVAD exchange for failure and others were expired in 3 months after LVAD placement.

CONCLUSIONS:

Our results demonstrate that the survival in obese patients with LVAD support was equivalent to that of non-obese patients, however, obese patients had higher incidence of infectious complications and failure of LVAD. Obese patients should be carefully selected before LVAD placement, especially severely obese patients for destination therapy.

O41-3

GASTROINTESTINAL BLEEDING WAS VERY RARE WITH HIGHLY PULSED CONTINUOUS FLOW LEFT VENTRICULAR ASSIST DEVICE EVAHEART

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<Purpose>
Gastrointestinal (GI) bleeding is crucial issue in long-term management of continuous-flow (CF) left ventricular assist device (LVAD) patients. Aim of this study was to investigate a relationship between the prevalence of GI bleeding in our new highly pulsed continuous-flow LVAD and the effects of von Willebrand factor (vWF) activities.

<Methods>
An implantable centrifugal blood pump (EVAHEART, SunMedical Technology Research Co., Japan) has a very flat HQ curve to generate pulsed high systemic flow circulatory support. We performed EVAHEART implantation for 11 patients with advanced heart failure (INTERMACS profile I - III, eligible for heart transplantation, mean age 37 years old) between March 2011 and February 2012. Coumadin sodium (PT-INR 2.5-3.0) and Aspirin (100-300mg) were given for anticoagulation therapy. Laboratory data of blood coagulation system, and factor VIII-antigen (VIII-Ag), and vWF ristocetin cofactor (RCo) were measured pre and post-operatively over time. The presence of HMW-vWF multimers was observed also.

<Results>
All patients survived with a mean follow-up period of 341 (range 234-537) days, and 2 of them underwent heart transplantation. There was no active GI bleeding in all patients in every clinical observation periods. The patients had no sighs of hemolytic anemia after implantation with normal hemoglobin (mean 12.2±1.4 g/dl) and lactate dehydrogenase (mean 222±56 U/l). The prothrombin time-international normalized ratio averaged 3.09±0.6 and mean platelet count was 25.6±6.3 x104/μL, postoperatively. HMW-vWF multimers were well maintained in all patients even after long-term support over a year. Factor VIII-Ag and vWF RCo decreased gradually with time course, but were kept more than 50% in each observation periods.

<Conclusion>
This result suggested that our newly developed highly pulsed CF-LVAD EVAHEART provides very low incidence of GI bleeding by means of maintenance the HMW-vWF multimers.

O41-4

WHO BENEFITS FROM SURGICAL VENTRICULAR RESTORATION: CONSIDERATION ACCORDING TO INTERMACS PROFILES

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Objective:
The shortage of donor hearts for heart transplantation and development of ventricular assist devices (VAD) have encouraged expanding application of VAD therapy for those with severe heart failure, though it could cause thromboembolic, bleeding, and infectious complications. In contrast, surgical ventricular restoration (SVR) may resolve those problems but can provide limited functional recovery of the left ventricle (LV). In this study, we examined responders to SVR according to INTERMACS profiles.

Methods:
Sixty-five patients who underwent SVR for dilated cardiomyopathy between 1999 and 2012 were studied. Etiologies were ischemic (ICM) in 30 and non-ischemic (DCM) in 35 patients. Among them, 10, 1, 2, 17, and 35 patients had INTERMACS profile 1, 2, 3, 4, and 5-6, respectively.

Results:
All patients underwent overlapping left ventriculoplasty. Mitral annuloplasty was performed for 26 (87%) ICM and 35 DCM patients. Coronary artery bypass was performed for 26 ICM patients. The NYHA functional class improved postoperatively (ICM: 3.3±0.5 to 1.5±0.6, P<0.001; DCM: 3.5±0.5 to 1.8±0.9, P<0.001). The LV end-systolic volume index decreased (ICM: 118±29 ml/m^2 to 77±24 ml/m^2, P<0.001; DCM: 155±49 ml/m^2 to 107±37ml/m^2, P<0.001) and LV ejection fraction increased (ICM: 21±6% to 27±7%, P<0.001; DCM: 20±7% to 25±10%, P<0.001). Mitral regurgitation also improved (ICM: 2.3±1.3 to 0.5±0.7, P<0.001; DCM: 3.5±1.0 to 0.3±0.6, P<0.001). Postoperative mortality was significantly different among those with each INTERMACS profiles for both ICM (log-rank P=0.027) and DCM (log-rank P<0.001) patients. Almost all patients with profile 1-3 died before discharge. Most of those with profile 4 were discharged but still presented high mortality. Their 5-year survival rates were 40% and 33% in ICM and DCM patients, respectively. In contrast, those with profile 5-6 presented satisfactory lower mortality with 5-year survival rates of 77% and 63% in ICM and DCM patients, respectively.

Conclusions:
Those with INTERMACS profile 5-6 may benefit from SVR.

O41-5

MINIMALLY-INVASIVE APPROACH FOR LEFT VENTRICULAR ASSIST DEVICE IMPLANTATION: LOWER MORTALITY AND IMPROVED EARLY OUTCOME IN ADULT PATIENTS WITH SEVERE HEART FAILURE

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Objectives

Left ventricular assist devices (LVAD) are gaining more importance in the treatment of heart failure. The constant development of novel technologies in this field is being reflected by enhanced and considerably miniaturized LVAD-systems. However from a surgical point of view, complications like bleeding or right ventricular failure with liver impairment are still major hurdles in LVAD-therapy. Therefore, we recently developed a novel minimally invasive LVAD implantation technique in order to minimize complication rates and improve operative outcome.

Methods

We reviewed the early outcome of 100 consecutive end-stage heart failure patients (74% male, age 51,6 ± 12,6, DCM 49%, ICM 36%) who recently underwent LVAD (HVAD, HeartWare, USA) implantation in our institution between 2011 and 2012. Patients who were operated conventionally by a median sternotomy (group A; n = 65) were compared to patients receiving a minimal invasive upper hemisternotomy combined with an anterolateral thoracotomy (group B; n = 35).

Results

Intra-hospital-mortality was lower in group B (12,3% vs. 8,6%). ICU stay was significantly lower ($p < 0,05$) in group B (20,2 ± 4,9 days vs. 9,8 ± 2,7 days). Bleeding incidence was also significantly ($p < 0,05$) lower in group B (18.5% vs. 5,7%). Postoperative glutamate dehydrogenase (GLDH) levels were also significantly ($p < 0,05$) lower in group B (76,2 ± 238,5 U/L vs. 15,5 ± 52,1 U/L). None of the patients had a pump thrombosis.

Conclusions

Our data show that the applied minimally invasive LVAD-implantation technique improves the early postoperative outcome by improving survival and reducing bleeding events, liver impairment and postoperative ICU stay of terminal heart failure patients.

O41-6

THE DIASTOLIC FUNCTION OF THE RIGHT VENTRICLE IS MORE SUSCEPTIBLE THAN THAT OF THE LEFT VENTRICLE BY CARDIAC SUPPORTING DEVICE IN CONGESTIVE HEART FAILURE

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OBJECTIVE:The Acorn CorCap, a Cardiac Supporting Device (CSD) which wraps around both ventricles by polyester mesh, was used to prevent cardiac remodeling process in dilated cardiomyopathy patients. However, criteria for the constrain level was not clearly defined, and the effect on right ventricle (RV) function was not evaluated previously. The objective of this study was to evaluate the effects of CSD size on diastolic and systolic function on both RV and Left ventricle (LV), and to determine the optimal size of CSD. **METHODS**: Yorkshire swine were used for this study. Heart failure was induced by rapid atrial pacing (200 bpm) for 3 weeks. LVEF dropped from 60.6±5.6% to 20.8+3.8%. CSD was designed to fit a explanted frozen swine heart, then knitted by computer assisted machine (Shimaseiki Co.). The size of the nets was changed by every 5% by changing the size of design paper for swine heart. The conductance and pressure catheters were placed in both LV and RV. The end-systolic pressure-volume relation (ESPVR: Emax) and end-diastolic pressure-volume relation (EDPVR) were measured by rapid infusion of fluid. Initial size of the net was set without stress (100% Net), and the sizes of the net were reduced by 5% down to 80%, and the measurements were repeated. **RESULTS**: Both Emax of RV and LV increased by the CSD size reduction. The impairment of EDPVR of RV and LV began at 10% and 15% of CSD size reduction, respectively. The impairment of RV diastolic function was greater than that of LV. **CONCLUSIONS**: The diastolic function of right ventricle determines overall cardiac function under CSD treatment. Ten percent size reduction by CSD is suitable for balancing the improvement of LV systolic function and the impairment of RV diastolic function.

O42-1

LESS INVASIVE TEMPORARY BIVENTRICULAR SUPPORT WITH CENTRIFUGAL PUMPS FOR FULMINANT MYOCARDITIS

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Background:

Fulminant myocarditis often develops rapid deterioration of cardiac function and requires mechanical supports for salvage. This report details our experience with temporal biventricular assist device (BVAD) using two extracorporeal centrifugal pumps in fulminant myocarditis patients who were immediately deteriorated even with extracorporeal membrane oxygenator (ECMO) support.

Methods and Results:

Eight fulminant myocarditis patients (male, 6; female, 2; age 38.9±4.0 years-old) who required ECMO support underwent temporal BVAD implantation because of progressive deterioration of general condition even with ECMO support. Preoperatively, ECMO can provide limited insufficient flow and their visceral organ function developed deterioration in all patients. After a mean ECMO support duration of 4.3 days, all implantation operations were performed safely, and their visceral organ function immediately improved after initiating BVAD support. Cardiac function recovered sufficiently in 7 patients, and 5 patients successfully underwent removal of BVAD after a mean duration of 17.4 days support except 2 patients died from cerebral hemorrhage and multiple organ failure. One patient underwent conversion to durable BVAD after improvement of their visceral organ function after 42 days support for awaiting heart transplantation.

Conclusions:

Our temporal BVAD system provided sufficient clinical results for fulminant myocarditis patients complicated with devastating complications. Comprehensive strategy for fulminant myocarditis patients is essential for more improvement of clinical results.

O42-2

EFFECTS OF HYPOTHERMIC CARDIOPULMONARY BYPASS PERFUSION TEMPERATURES ON EARLY POSTOPERATIVE RENAL FUNCTION ON PATIENTS UNDERGOING ON-PUMP CORONARY ARTERY BYPASS GRAFTING AT THE PHILIPPINE HEART CENTER

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OBJECTIVE: On-Pump Coronary Artery Bypass Grafting (CABG) increases the risk of the patient developing Acute Kidney Injury (AKI) therefore increasing in-hospital mortality. The technique of using hypothermia during CPB is primarily to reduce the metabolic demand of the body but no definite temperature for renal preservation has been recommended in literature. This study aims to determine if varying CPB temperatures would play a role in the development of early postoperative AKI in patients undergoing elective On-Pump CABG.

METHODOLOGY: This is a prospective cohort study on patients undergoing first time On-Pump Elective CABG at the Philippine Heart Center (PHC) from June 1, 2011 to May 31, 2012 without evidence of preoperative renal insufficiency. Medical history and intra-operative variables were collected. Institutional surgical protocols and extracorporeal perfusion techniques with the exception of the intended core temperature during CABG was followed. Two measurements of serum creatinine were done via blood extraction >12 hours apart. Primary endpoint was the development of early postoperative AKI (as defined by the Acute Kidney Injury Network).

RESULTS: 197 patients were included. AKI occurred in 47 (23.9%) patients, 32 (25.4%) from the moderate hypothermia group (28°C - 30°C) and 15 (21.1%) from the mild hypothermia group (32°C). Fischer's exact test to determine the association of the two groups of CPB temperatures and development of AKI showed no association of CPB temperature with the development of AKI. After adjusting for confounders, only Diabetes Mellitus (Odds Ratio 2.20, 95% Confidence Interval: 1.05,4.60, p = 0.036) showed significant association with the development of AKI post operatively.

CONCLUSION: The varying hypothermic CPB perfusion temperature had no effect on early post operative renal function particularly the development of AKI in patients undergoing elective On-Pump CABG at the PHC and that multiple factors in the perioperative phase were the reasons for renal dysfunction post operatively.

O42-3

ECMO SUPPORT IN INTERMACS CLASS 1 PATIENTS AS A "BRIDGE TO DECISION": 8-YEARS EXPERIENCE

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Treatment of refractory cardiogenic shock with VAD or transplantation is controversial. The aim of our study was to evaluate ECMO support as a bridge to decision in "crash and burn patients" through our 8-years experience.

From June 2003 to December 2011, 124 patients received an ECMO for refractory cardiogenic shock, 26 out-hospital cardiac arrests were excluded from our study. Median age was 43 years, range from 11 to 73 years. Primary diagnoses were postcardiotomy failure (29.6%), end stage heart failure (18.4%), acute ischemic cardiomyopathy (17.4%), primary graft failure (12.2%), myocarditis (5.1%) and others (17.3%). ECMO was used in in-hospital arrest in 37.8% of cases. Peripheral femoro-femoral ECMO was mainly implanted (79.6%), a "central ECMO" was used in 20 patients.

The median duration of ECMO support was 4.5 days (12 hours to 82 days). Mortality while supported with ECMO was 50% (40 patients) with a median support time of 2 days. Weaning from ECMO was achieved through cardiac recovery (57.7%), heart transplantation (26.5%), VAD implantation (14.1%). Most of the patients were weaned between the 4th and the 11th days of support (87.5%). Survival was 82.7%, 61.5% and 71.4% in case of cardiac recovery, heart transplantation or VAD implantation respectively. Stroke and persistent renal function impairment were significant risk factors with OR : 4.940 [2.274-10.732], p<0.001 ; HR 9.195 [1.546-54.671], p=0.01;respectively. Median follow up was 2.4 year; one-year survival was 77%, 55% and 75% for cardiac recovery, heart transplantation and VAD implantation respectively.

ECMO brings promising results as a bridge to decision in end stage refractory cardiogenic shock patients. Persistent renal function failure while supported with ECMO was associated with poor outcome. Further studies are needed to build appropriate risks score to better determine issues for patients supported with ECMO.

O42-4

EXTRACORPOREAL MEMBRANE OXYGENATION APPLICATION IN CRITICAL ENDOCRINOLOGICAL EMERGENCY

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Purpose:

Extracorporeal membrane oxygenation (ECMO) had been proved successful in rescuing critical cardiopulmonary collapse. Few cases related to endocrinological crisis were reported. No series study had been published. We conducted this study to review our experience in treating endocrinological crisis with ECMO.

Materials and Methods:

We reviewed the data regarding to endocrinological crisis with acute cardiopulmonary collapse. These patients all suffered from critical deterioration requiring ECMO support. The ejection of fraction of left ventricle was around 20% before ECMO setup.

Results:

Nine patients were enrolled in the study, 5 patients related to thyroid storm(TS) and 4 patients related to pheochromocytoma(Ph), with mean age 42.8 years. The tow groups had different manifestation after ECMO. Rapid recovery of myocardial function and pressure was found in Ph group. ECMO may be removed early in Ph group, but one required another ECMO before definite diagnosis. Only one patient expired in thyroid storm group because of the delayed diagnosis and resuscitation.

Conclusion:

Endocrinological crisis either with TS or Ph is rare to be rescued with ECMO. However, the differential diagnosis should be kept in mind after ECMO initiation for the cardiopulmonary collapse. Early diagnosis and treatment would have excellent outcome.

O42-5

CONTINUOUS-FLOW TOTAL ARTIFICIAL HEART IMPLANTATION VIA A MEDIAN STERNOTOMY IN THE CALF MODEL

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OBJECTIVE: Preclinical evaluations of left ventricular assist devices and total artificial hearts have traditionally been performed via a lateral thoracotomy using calves. To evaluate feasibility of a median sternotomy approach and the biocompatibility and performance of the continuous-flow total artificial heart (CFTAH), the CFTAH was implanted in two calves via a median sternotomy.

METHODS: The native ventricles of 2 calves (weight 89.6 and 77.0 kg) were excised and replaced with the CFTAH via a median sternotomy. The pump speed was fixed at either 2,900 or 3,100 rpm with 15% sinusoidal speed modulation. No anticoagulation drugs were given postoperatively except for heparinized solution (10 U/ml) to keep pressure monitoring lines patent.

RESULTS: Access was good particularly for the atrial suturing of the CFTAH prostheses and for hemostasis of all suture lines. Postoperative bleeding and neurological issues were not observed, and both animals were extubated and standing within 24 hours after the surgery. One calf survived throughout the planned duration of 14 days and the second calf was terminated after 13 days due to the digestive issue. General condition and hemodynamics were stable. The results of hemodynamic parameters in each calf were as follows: measured right pump flow, 8.6 ± 0.8 and 7.9 ± 0.6 L/min; pump power, 14.1 ± 1.2 and 11.5 ± 0.6 W; mean aortic pressure, 99.2 ± 7.3 and 95.3 ± 8.0 mm Hg; and pulmonary arterial pressure, 32.1 ± 4.3 and 28.1 ± 2.9 mm Hg. The atrial pressure difference in both calves was maintained within our goal of ± 10 mm Hg. Both animals were able to spontaneously get up and down and had a partial superficial wound dehiscence.

CONCLUSIONS: Sternotomy approach allowed for an easier surgical operation with good hemostasis of the suture lines. Further evaluation of this access vs. thoracotomy is indicated.

O43-1

SIGNIFICANT REDUCTION OF DEEP STERNAL WOUND COMPLICATIONS USING THE POSTHORAX SUPPORT VEST: RESULTS OF A RANDOMIZED CONTROLLED PROSPECTIVE TRIAL

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Objective:
A prospective randomized mulitcenter trial was performed to analyze the efficacy of the Posthorax support vest to prevent sternal wound infection after cardiac surgery, and to identify risk factors.

Methods:
From September 2007 onwards, 2699 patients undergoing cardiac surgery via median sternotomy were prospectively randomized into those who received a Posthorax vest and those who did not. Patients were instructed to wear the vest postoperatively for 24 hours a day for at least 6 weeks; the duration of follow-up was 90 days. Patients who did not use the vest within a period of 72 hours postoperatively were regarded as study drop-outs. Statistical calculations were based on an intention-to-treat (ITT) analysis. Further evaluations comprised all subgroups of patients.

Results:
Complete data were available for 2539 patients (age 67±11years, 45% female). Of these, 1351 were randomized to receive a vest while 1188 received no vest. No significant differences were observed between groups as regards age, gender, diabetes, BMI, COPD, renal failure, the logistic Euroscore, and the indication for surgery. The frequency of deep wound complications was significantly lower in vest (n=14; 1.04%) versus non-vest (n=27; 2.27%) patients (ITT, $p<0.01$), but superficial complications did not differ between groups. Subanalysis of vest patients revealed that only 933 (Group A) wore the vest according to the protocol while 202 (Group BR) refused to wear the vest (non-compliance) and 216 (Group BN) did not use the vest for other reasons. In these particular subgroups the sternal wound complications were significantly elevated.

Conclusion:
Consistent use of the Posthorax vest prevented deep sternal wounds. The anticipated risk factors for wound complications did not prove to be relevant, whereas intra- and postoperative complications appear to be significant.

O43-2

THE LAPAROSCOPICALLY HARVESTED OMENTAL FLAP AND TRANSVERSE PLATE FIXATION FOR STERNAL RECONSTRUCTION IN COMPLICATED STERNAL WOUND INFECTION AFTER CARDIAC SURGERY

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Objective:

To report our experience with the laparoscopically harvested omental flap and transverse plate fixation for sternal reconstruction after complicated sternal wound infection.

Methods:

Between 2010 and 2011, 6 patients with type IV deep sternal wound infection underwent a sternal reconstruction with a laparoscopically harvested omental flap and transverse plate fixation. The median age of the cohort (1 female and 5 males), was 72.5 years (range: 49-78 years). In 5 patients, a bilateral internal thoracic artery had been used. Considerable preoperative risk factors were present: Obesity with Body Mass Index (BMI) > 33 (range: 33 to 35: 3 patients); chronic obstructive pulmonary disease (COPD) without steroid therapy preoperatively (4 patients); Diabetes mellitus (type 1: 2 patients; type 2: 1 patient). Abdominal surgery had previously been performed in 4 patients. In 5 cases, the mediastinal wound was prepared with negative pressure wound therapy following surgical debridement. An internal fixation of the sternum was made by titanium locking plates with sternal and rib-to-rib fixation. The postoperative course of these patients was followed by clinical follow-up.

Results:

Early postoperative sternal stability was seen in all 6 patients. The 30-day perioperative mortality rate was zero, with an overall survival of 100% until today.

Postoperatively no superficial or deep surgical site infection (SSI) were appreciated.

Follow-up ranged from 18 to 35 months (median: 22 months).

Conclusions:

Combination of a laparoscopically harvested omental flap and transverse plate fixation can contribute to a successful outcome following complicated sternal wound Infection and deserves serious consideration, regardless of the co-morbidity or previous abdominal surgery.

O43-3

SIMPLE DEVICE TO KEEP THE STERNUM OPEN FOR THE PURPOSES OF DELAYED STERNAL CLOSURE

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Delyed sternal closure (DSC) is needed in up to >4% of adult cardiac surgical cases with increasing need in younger age groups, reaching, amongst the infants and the neonatal age groups, to 22% to 61% cases, respectively.

Traditionally surgeons use barrels of syringes or chest tubes to hand craft sternal stents for keeping the sternal edges apart. At best these "on-the-table-engineered" stents are an approximate fit for the purpose, result in unstable thoracic cage, carry potentially harmful sharp edges and allow blood/fluid to accumulate inside the tubes increasing the risk of infection. Besides, the act of cutting the syringes/chest tubes into a required shape, on the operating table, is not only cumbersome but could also be injurious to the fabricating surgeon. This is something the surgeons can do away with at the end of a difficult and prolonged operation.

For DSC to achieve its objectives not only extra substernal space is to be provided but the thoracic cage needs to be stabilised as well. In the absence of Sternal stability, the ventilatory, nursing and Physiotherapy care is compromised. Furthermore, the sternal edges may injure the right ventricle when the patient is moved. Keeping these objectives in site, a simple set of sternal stents ["Al-Saned" (Arabic for "supporter") stents] were created.

These stents provide a strong, easy to use set of graduated struts which firmly keep the sternal edges apart and secure it into a non-flail thoracic cage. These allow firm fixation to the patient, allowing maximum substernal space to accommodate tissue oedema. It slow profile allows easy view of the mediastinum. Furthermore, the absence of moving parts, crevices or tubes avoid trapping of blood clots & fluids, minimizing the risk of infection.

We have successfully used these stents in two adult and two Paediatric patients.

O43-4

CARDIOVASCULAR SURGERY IN 10 PATIENTS WITH TUMORS OF HEMATOPOIETIC AND LYMPHOID TISSUES

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Objective: Patients suffering from tumors of hematopoietic and lymphoid tissues are at increased risk when undergoing cardiovascular surgery (CVS). We report our experiences with CVS in 10 patients with tumors of hematopoietic and lymphoid tissues.

Material and Methods: Ten patients with tumors of hematopoietic and lymphoid tissues underwent CVS at our institute between January 2000 to July 2012. Their records were retrospectively analyzed for preoperative treatment for their hematological disorders , operative time, amount of blood loss, amount of given blood products, complications, duration of hospital stay and 30 day mortality.

Results: The mean age of the 10 patients (7 males and 3 females) was 70.6 ± 5.84 years. There were one patient with acute lymphocytic leukemia, one patient with chronic lymphocytic leukemia, one patient with diffuse large B-cell lymphoma, 3 patients with multiple myeloma, one patient with myelodysplastic syndrome, one patient with polycythemia vera, one patient with essential thrombocytosis and one patient with monoclonal gammopathy of undetermined significance. Four patients underwent preoperative treatment for tumors of hematopoietic and lymphoid tissues. CVS procedures were off-pump CABG in three, aortic valve replacement in five, and total aortic arch replacement in two patients. The mean operative time was 393 ± 136 minutes. The mean amount of blood loss was 1344 ± 1306 ml. We transfused 6.3 ± 6.7 units of red blood cells, 7.6 ± 8.5 units of fresh frozen plasma and 10.0 ± 6.2 of platelet concentrates. The average One patient developed superficial wound infection, two patients developed atrial fibrillation and one patient developed cerebral infarction. All patients were discharged an average of 25.7 ± 12.9 days. No patients died in 30 days after surgery.

Conclusions: CVS in patients with lymphoid tissues may be performed safely, when the indications for procedures are carefully considered.

O43-5

15YEARS EXPERIENCE OF CARDIAC SURGERY IN RENAL TRANSPLANT RECIPIENTS

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OBJECTIVE:

There are increasing number of patients receiving renal transplantation in Japan, and cardiac surgery for renal transplant recipients are getting more important since cardiovascular complications are major cause of morbidity and mortality among them. We evaluated our results of the surgery retrospectively.

METHODS:

Between 1997 and 2012, 12 renal transplant recipients with functioning allograft at the time of cardiac surgery were identified. Cardiac procedures included valve surgery (5 patients, 42%), coronary artery bypass grafting (2 patients, 17%), aortic procedures (3 patients, 25%), and others (2 patients).

RESULTS:

The mean age was 52.9 ± 12.6years (range, 38 to 68). 5 patients were male. The median interval from renal transplant to cardiac surgery was 15.7 years ± 8.4years (range, 0.6 to 31.7). Preoperative renal insufficiency (estimated GFR < 30 ml/min./1.73m2) was fond in 6 patients (50%). Only 1 patient whose preoperative estimated GFR was 7.1 required permanent dialysis postoperatively. Mean estimated GFR was not significantly decreased (30.5, 25.8 and 36.6 at pre-operation, postoperative lowest level and discharge, respectively). There was no mortality and no infectious complication.

CONCLUSIONS:

Under careful attention to renal function and infectious complication, cardiac surgery in patients with functioning renal allograft has acceptable outcomes.

O43-6

CONTINUOUS HEMODIAFILTRATION THERAPY AFTER CORONARY ARTERY BYPASS GRAFTING APPLYING TO PATIENTS NOT DEPENDING ON DIALYSIS

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BACKGROUND
Previous studies have reported the effects of continuous hemodiafiltration therapy (CHDF) on patients after coronary artery bypass grafting (CABG), which most of the studies have focused on hemodialysis patients.
OBJECTIVE
We have been applying the CHDF after CABG not only to patients on hemodialysis, but also to who are not depending on dialysis. In present study, we examined whether the therapy has effects on these patients without renal failure.
METHODS
From December 2006 to January 2012, 211 patients not depending on dialysis received isolated CABG. Patients were divided in CHDF(+) group(n=38) who received CHDF in ICU immediate after their arrival, and CHDF(-) group(n=173) who did not. Two groups were compared retrospectively. Age, gender, body weight, emergency procedure, under IABP support preoperatively, diabetic, and serum value of BUN and CRE were compared as preoperative factor. Operative duration, ON-pump procedure, number of proceeding grafts, utilizing L(R)ITA, quantity of bleeding, urine, and water balance during the operation were compared as operative factor. Urine volume in ICU, duration of intubation, inotropic support, thoracic drainage, and stay in ICU was compared as postoperative factor. Thirty day mortality after surgery was examined in both groups.
RESULTS
CHDF(+) vs. CHDF(-):Age(74vs.68yr*), emergency procedure(74vs.29%*), preoperative IABP support(66vs.33%*), BUN(30vs.17mg/dl*), CRE(1.7vs.0.9mg/dl*). Utilizing L(R)ITA(63 vs.85%*), intraoperative urine(890vs.1373ml*) and water balance(+2641vs.+2016ml*). Duration of intubation (2.4vs.0.6 days*), inotropic support (6.4vs.3.8 days*), drainage (4.7vs.3.9 days*), and ICU stay(9.7vs.6.0days*). *$p<0.05$. There was one thirty day mortality in CHDF(+) group.
CONCLUSIONS
Aged patients with impaired cardiac and renal function were receiving CHDF after emergency operation. During the operation, these patients had small urine in quantity which made them edematous even in less invasive procedure. Present study revealed that applying CHDF after CABG to who are not depending on dialysis has effects mean by keeping their urine volume and lead to low mortality even in high risk patients.

O44-1

CHECK-VALVED PATCH CLOSURE OF VENTRICULAR SEPTAL DEFECTS IN PULMONARY HYPERTENSIVE PATIENT

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Objective:Late presentation of patients with pulmonary hypertension secondary to VSD still accounts an important cardiac medical and surgical concern especially in developing countries.

Methods:Between July 2010 and December 2012, 162 patients with VSD were operated at our institution. Among the patients 19 patients were severely pulmonary hypertensive and underwent unidirectional check-valved patch closure of the VSD. Patients were followed with pulse oxymetry and serial echocardiographies.

Results:Ages of the patients ranged between 4 and 17 years. Mean indexed pulmonary vascular resistance and mean systemic oxygen saturation were 9.1 ± 2.7 wood units and 94.6 ± 5.4%, respectively, at the pre-operative period. Shunt was bidirectional in 15 and right to left in 4 patients. At the postoperative period the oxygen saturation ranged between 92-100%. In four patients there was periodic saturation drops below 95% which was confirmed with echocardiographic right to left shunt. There was no mortality during the hospitalization and mean follow-up of 18,2 ± 14.7 months periods. All patients were followed at NYHA Class 1 functional status.

Conclusion:Check-valved patch closure of VSDs in patients with pulmonary hypertension with increased and reactive pulmonary vascular resistance is feasble and can be performed with acceptable mortality and morbidity rates.

O44-2

COMPREHENSIVE MANAGEMENT BASED ON PATHOLOGICAL ANALYSIS OF OPEN LUNG BIOPSY TO PATIENTS WITH ADULT CONGENITAL HEART DISEASES WITH SEVERE PULMONARY ARTERY HYPERTENSION

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BACKGROUND: Management of patients with adult congenital heart disease(ACHD) with severe pulmonary arterial hypertension(PAH) requires meticulous analysis of the condition of the pulmonary vasculature and treatment plan for each patient to achieve satisfactory results. METHODS: We employed active strategy of combined surgical and medical approach based on the pathophysiological analysis of specimens from open lung biopsies through Yamaki's both qualitative and quantitative analyses. This concept stands for the probable overestimation of severity of the obstructive disease by the conventional hemodynamic assessment with catheterization and/or pulmonary vaso-dilator challenge test in the situation with combined effects of true pulmonary vascular occlusive disease and other factors as hypoxic vaso-constriction, increased viscosity from polycythemia and increased collaterals and so on. Comprehensive, combined surgical and medical treatment includes aggressive preoperative pharmacological intervention as well as postoperative continuation of combination vaso-dilator therapy to improve the operability and semi-curative surgery with intentional controlled fenestration(communication) in the interatrial septum if indicated. RESULTS: Though this approach two cases, one 36 year-old female with polysplenia, AVSD, IVC interruption with hemiazygos vein continuation and anomalous systemic and pulmonary venous connections and the other 41-year-old female with ASD, both once diagnosed as contra-indicated to surgery, came to corrective or semi-corrective surgeries. Postoperative studies showed normalizing pulmonary artery pressures with significantly improved QOL. Life longevities of these patients can be expected so far improved. CONCLUSION: The indications and number of patients benefitted from this approach are limited, however this comprehensive approach with, although invasive, open lung biopsy offers important improvement of QOL and chance of longer survival to patients with ACHD with severe PAH.

O44-3

PREDICTIVE VALUE OF ARISTOTLE COMPLEXITY SCORE FOR RISKS OF CONGENITAL HEART SURGERY IN ASIAN COUNTRY

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Objective: Aristotle Complexity Score was developed to predict the risks of congenital heart surgery and its validity has been reported based on European and North American database. However, there is regional difference for the incidences of various congenital heart defects and every country has different healthcare environments. So we evaluate the predictive value of Aristotle Scoring System in Asian Country.

Methods: Aristotle Basic and Comprehensive Scores were prospectively assigned to all consecutive surgical procedures for congenital heart surgery between January 2008 and August 2012 in our institute. We defined the major morbidity based on the Society of Thoracic Surgeons National Database. The discriminator power of the scoring system for mortality and major morbidity was analyzed by Goodness-of-fit test using Logistic Regression model.

Results: 821 surgical procedures were performed for congenital heart defects. Aristotle Basic Score was 6.8±2.2 and, Comprehensive Score was 8.2±3.0. There were 31 surgical mortalities and major morbidities developed in 223 cases. The p-value of Goodness-of-Fit test for surgical mortality and major morbidities of the Basic Score were 0.602, and 0.002 respectively. C-index was 0.735 (95% CI: 0.646 - 0.823), and 0.672 (95 CI: 0.630 - 0.713). The p-value of Goodness-of-Fit test for surgical mortality and major morbidities of the Comprehensive Score were 0.728, and 0.504 respectively. C-index was 0.781 (95% CI: 0.688 - 0.874), and 0.709 (95 CI: 0.669 - 0.749).

Conclusions: Aristotle Basic and Comprehensive Scores is an adequate model to predict the surgical mortality and the Comprehensive score has higher predictive power. For major morbidity, the Comprehensive Score is an adequate model, but the Basic Score is not. Risks for morbidity are more influenced by the preoperative patient's clinical condition than the type of procedure. The system can be used to stratification of the risks of surgical procedures for congenital heart defects in Asian Country.

O44-4

MINIMALLY INVASIVE DIRECT, STERNAL SPARING APPROACH FOR CONGENITAL HEART SURGERY

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Minimally Invasive, Direct, Sternal sparing approach for congenital heart defect.

OBJECTIVE:

Minimally invasive approach for surgical treatment for congenital heart defect is relatively new concept. Minimally invasive technique is our preferred method for last few years in selected cases. We present our experience of 40 cases including ASD closure,VSD clodure,ASD and VSD with PS and TOF total correction.

METHODS: 40 patients underwent minimally invasive congenital heart surgery from march 2011 through oct. 2012.The surgical approach is through a small (3.0 inch) lateral thoracotomy through the right third /second/fourth intercostal space. Femoral arterial and venous cannulation is used for cardiopulmonary bypass (CPB)in most of the cases.

RESULTS:

The difference in average CPB and aortic cross clamp times are not significantly different as compared to conventional sternotomy approach for any subgroup of procedures. The average intensive care (ICU) stay, hospital stay, and transfusion requirement are significantly less ($p<0.001$ for all parameters for all subgroups). There is no wound infection and mortality in this group.

The cosmetic results,tremendous psychological benefit and lower loss of man work hours is an extremely important advantage of this approach especially for small kid and young female.

The cost of the small initial investment of surgical equipment is offset by the short ICU and hospital stay as well as lower transfusion and antibiotic requirement.

CONCLUSION:

The minimally invasive, direct approach for congenital heart defect procedures is safe, reproducible, inexpensive and cosmetically superior. It is the imminent gold standard for both developing and developed nations.

O44-5

PATIENT-SPECIFIC INDUCED PLURIPOTENT STEM CELLS RECAPITULATE THE MODELS OF HYPOPLASTIC LEFT HEART SYNDROME

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Objective- Single ventricle (SV) defects including hypoplastic left heart syndrome (HLHS) is the most severe congenital heart malformations. The generation of patient-specific induced pluripotent stem (iPS) cells may offer a new strategy for disease modeling. ***Methods-*** Cardiac progenitor cells (CPCs) from 18 patients with congenital heart diseases were isolated and infected with retroviruses encoding human transcription factors, Oct4, Sox2, Klf4, and c-myc. Immunostaining, bisulfite sequencing, and global gene expression analysis were performed and established iPS cells were transplanted into NOD/SCID mice for teratoma formation. ***Results-*** SV-derived CPCs had defective expression of Nkx2.5 and Hand1 but resulted in enhanced proliferative capacity compared with those from patients with bi-ventricle (BV) phenotypes. Patient-specific iPS colonies were found with higher reprogramming efficiency in SV-derived CPCs compared with those generated from BV hearts (77% vs 20%, n=18; p=0.026). Disease-specific iPS cells were uniformly expressed stringent pluripotent markers, Nanog, Oct4, TRA-1-60, TRA-1-81, SSEA-3/4, and alkaline phosphatase. Although global gene analysis revealed that inductive signals essential for early cardiomorphogenesis, including BMP2, Sema3A, isl1, Bop1, BMP type-IB receptor, Nkx2.5, Wnt3a, Tbx5, and Hand1/2, were significantly repressed in HLHS-derived CPCs, genes indispensable for mesoderm formation such as Notch1, Foxh1, GATA5, and Mesp1 expressions increased remarkably compared with BV-derived CPCs. Upon cardiac differentiation, cardiac structural proteins and transcriptional factors such as Nkx2.5, Tbx5, isl1, and Hand2 were significantly downregulated, leading to impaired calcium handling properties with respect to amplitude and frequency in HLHS-derived iPS cells. ***Conclusions-*** Our results suggest that patient-specific iPS cells provide an unprecedented research tool to study complex heart diseases that could not be physiologically reconstituted in animal models. HLHS-derived iPS cells have distinct cardiac differentiation program that may be applicable for disease investigation and development of novel regenerative medicine for congenital heart diseases.

O45-1

LA FLUTTER AS A COMPLICATION OF THE MAZE PROCEDURE USING CRYOABLATION FOR TREATMENT OF PAROXYSMAL AND PERMANENT AF IN PATIENTS UNDERGOING CONCOMITANT CARDIAC SURGERY

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Purpose: The objective of this study was to evaluate the incidence of LA flutter as one of the complications of the MAZE procedure using cryoablation for treatment of AF in patients undergoing cardiac surgery. We sought to identify the predictors of failure for this particular tachyarrhythmia and recognise patterns in order to avoid this complication in MAZE procedure.

Methods: From July 2003 to Dec 2010 227 consecutive patients (mean age 73.1 years) who underwent cryoablation for AF were evaluated and divided into 2 groups. Group A the left sided Maze for paroxysmal AF (n=119) and Group biatrial Maze for permanent AF (n=108). 17(6.74%) patients out of 227 presented with symptomatic LA flutter and 10(5.1%) of them were from Group A while 7(8.75%) from Group B. EP studies were conducted in all of them.

Results: Success rate with freedom from AF after MAZE procedure for Group A at 12 months was 85.5% and for Group B 73.2%.On EP studies in 3 patients from Group A one had microreentry circuit around LA appendage while other two had lesions at the roof of PV and the MV annulus. All of them were successfully ablated. In 6 patients from Group B we identified foci around LA in each of them and 2 had additional foci in the isthmus. All of them had incomplete lesion around MV annulus. 5 out of 6 from Group B were ablated with success. We analysed if other risk factors and predictors of failure that played role in atrial tachyarrhythmias.

Conclusions: The cryoablation for AF in patients undergoing cardiac surgery is safe and effective but certain subset experience symptomatic atrial arrhythmias which must be addressed and treated in EP lab. The combination of two modalities, catheter and surgical ablation, can improve the outcome even in complex patients.

O45-2

COMPARISON OF LONGTERM RESULTS BETWEEN RADIOFREQUENCY(RFA) MAZE AND RFA-CRYO MAZE IN ATRIAL FIBRILLATION PATIENTS WITH MITRAL VALVE SURGERY

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Objectives. This study evaluated the prevalence of postoperative sinus rhythm (SR) and its prognostic factors in comparison between mitral valve surgery patients with atrial fibrillation (AF) undergoing radiofrequency ablation (RFA) maze (group I) and RFA cryo maze (group II).

Methods. From June 2004 through July 2012, a retrospective review was performed on 188 patients with mitral valve disease and chronic atrial fibrillation (AF) underwent intraoperative radiofrequency ablation (RFA) Cox maze (95 patients, group I) and RFA-Cryo ablation (93 patients, group II) with concomitant mitral valve surgery. Overall probability of time-related postoperative SR occurrence was estimated. Factors associated with failure of the ablation and recurrent AF was determined.

Results. At a mean follow up of 48 months (range 1 to 96), 158 (84.4%) patients were in sinus rhythm and 28 (14.9%) were in atrial fibrillation. The probability of sinus rhythm at 24 and 72 months was 88% and 73%. 12 (7.5%) patients who had previous SR conversion had recurrent AF. Larger left atrial diameter was significantly associated with persistent AF after operation. When two groups were compared, there seem to be no effect of cryotheraphy on the probability of SR (p=0.017). All the differences between the two groups were attributed to other confounding factors.

Conclusions. The RFA maze can be performed in addition to mitral valve surgery procedure with high success rate of SR conversion. Additional cryo ablation to RFA did not show significant on early and long term results on probability of sinus rhythm conversion.

O45-3

HOW TO CHOOSE SURGICAL PROCEDURE FOR ATRIAL FIBRILLATION, THE FULL-MAZE OR PVI?

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OBJECTIVE: Various surgical ablation devices have been developed to simplify the Maze procedure. Pulmonary vein isolation without any atrial incisions has become feasible using these ablation devices. The purpose of this study is to determine indication of surgical procedure of atrial fibrillation (AF).

METHODS: Between April 2007 and December 2012, 61 consecutive patients underwent AF surgery using an RF ablation device in our institution (the Full-Maze procedure in 44 patients, pulmonary vein isolation (PVI) in 13 patients, and right atrial Maze + PVI in 5 patients). The average age was 64±10 years old. The mode of preoperative AF was paroxysmal in 24 patients and chronic in 37. Forty six patients (75%) had valvular heart disease. The AF cure ratio was verified during follow-up after AF surgery.

RESULTS: The AF cure ratio was 86% and 100% in chronic and paroxysmal AF patients after all of AF surgery, respectively (p=0.16). In chronic AF patients, the PVI was performed for the patients with cancer, porcelain aorta, chronic obstructive pulmonary disease or severe renal disturbance. Although the AF cure ratio in chronic AF patients was improved from 87% at the time of hospital discharge to 94% at the late postoperative phase after the Full-Maze procedure, the AF cure ratio was decreased from 60% to 40% after the PVI. In the paroxysmal AF patients, the AF cure ratio was 100% at the time of hospital discharge and late phase after any type of AF surgery.

CONCLUSIONS: The Full-Maze procedure should be first choice of AF surgery for chronic AF. However the PVI is less effective than the Full-Maze procedure for chronic AF patients, it could provide the potential for cure of chronic AF with contraindication to the Full-Maze procedure.

O45-4

DEPRESSED TRANSIENT OUTWARD AND ULTRA-RAPID DELAYED RECTIFIER POTASSIUM CURRENTS UNDERLYING ACTION POTENTIAL CHANGES IN HUMAN ATRIAL FIBRILLATION

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Background: Atrial fibrillation(AF) affect the molecular remodeling of ion channels in the atrial myocytes, but the atrial cellular electrophysiological mechanisms in humans are unclear. Objective: The aim of this study was to compare action potentials and potassium currents (transient outward current and ultra-rapid delayed rectifier current) in two groups of myocytes isolated from human atria with AF or sinus rhythm(SR). Methods and Results: Right atrial myocytes were obtained from 13 patients with chronic AF and 30 patients in SR. The whole cell patch clamp technique was used to record action potentials, the effective refractory period (ERP) and potassium ion currents in enzymatically isolated atrial myocytes. The expressed mRNA levels of Kv1.5, Kv4.3 and KChIP2 in atrial tissue were detected by quantitative real-time reverse transcription polymerase chain reaction. The presence of AF was associated with a marked shortening of the AP duration. AF significantly reduced the mRNA expression of Kv4.3, which was paralleled by a reduction in transient outward potassium (Ito) current densities in AF group of patients (8.77±1.22 pA/pF vs. 2.29±0.41 pA/pF at +60 mV, $P<0.05$). The ultra-rapid delayed outward current(Ikur) was also decreased in AF(3.51±0.53 pA/pF vs. 1.41±0.16 pA/pF at +60 mV, $P<0.05$). The kinetics properties of Ito and Ikur were hardly modified by chronic AF. Conclusions: Our results demonstrated AF leads to significant shortening of AP duration and down-regulation of Ito and Ikur in human atrial myocytes. These changes contribute to electrical remodeling in AF and maybe further promote the perpetuation of the arrhythmia.

O45-5

ASSESSMENT OF IMMEDIATE AND MID-TERM RESULTS FOR THE SURGICAL TREATMENT OF PATIENTS WITH ATRIAL FIBRILLATION

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Objective: To assess immediate and mid-term results for surgical treatment of the patients with AF

Methods: From January to October 2012 we operated on 64 patients with AF. 6 patients (9.4%) were with isolated AF and 58 patients (90.6%) had AF with other cardiac pathology. Women/men were 50/14. Preoperatively, patients were in classes NYHA 21 (32.8 %) in II, 41 (64.1 %) in III, and 2 (3.1 %) in IV. The rheumatic etiology of disease was in 38 patients (65.5 %), dysplasia in 8 (13.8%), degenerative in 10 (17.3%), and congenital (ASD) in 1 (1.9 %). Of the comorbidities were: arterial hypertension 48 (75%), stroke 9 (14.1%), renal failure 6 (9.4%), diabetes 5 (7.8%), carotid arteries atherosclerosis 14 (21.9%), COPD 5 (7.8%), obesity 6 (9.4%). Cardiac surgeries included mitral valve replacement/repair, aortic comissurotomy, ASD closure, etc.

Results: Hospital mortality was 0%. Bleeding, not according with ablative procedure, required rethoracotomy was in 2 (3.1%) cases. At discharge sinus rhythm was in 53 (82.7%) patients. In 6 months we observed 27 (51.9%) patients. Sinus rhythm was in 22 (81.5%) patients, AF was in 4 (25.9%), in 1 (3.7%) was pacemaker rhythm. In 12 months we examined 14 (25.9%) patients. Sinus rhythm was in 12 (85.8%) patients, AF was in 1 (7.1%) and in 1 (7.1%) was pacemaker rhythm. In 47 (90.4%) patients was marked I and II classes NYHA. By results of one-year follow-up echocardiography was decrease of left atrium volume (82.7±17.4 ml compared with 142.3±18.7 ml ($p<0.05$) preoperatively) and increase of LVEF (58.2±1.4% compared with 60.3±1.2% ($p>0.05$) before surgery).

Conclusion: 1. Restoring sinus rhythm at discharge is a favorable prognostic factor for it saving in the remote period. 2. By mid-term results there are positive trend in remodeling of left atrium, and increase of left ventricle ejection fraction for.

O45-6

PULMONARY VEIN EXIT BLOCK IS A POOR PREDICTOR OF ONE-YEAR OUTCOME AFTER TOTAL ENDOSCOPIC ABLATION OF ATRIAL FIBRILLATION

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OBJECTIVE Total endoscopic ablation of AF is an option in patients not suitable for or refractory to catheter ablation. The presence of pulmonary vein exit block (PVB) after ablation is considered as a confirmation of successful isolation, but of uncertain prognostic value.

METHODS 24 patients (mean age 67.6 ± 7.6 years) with symptomatic AF (paroxysmal n=7, persistent n=8, longstanding persistent n=9) were included in the study. The median duration of AF was 10 years. Using three right-sided ports, an epicardial left atrial box lesion was accomplished using a vacuum-assisted unipolar temperature-controlled radiofrequency catheter (60°, 120 + 90 seconds). After completed ablation, pulmonary vein exit block was tested. One-year follow-up with 72 hour Holter ECG was complete.

RESULTS There was no mortality. At twelve months, 18/24 patients (75%) were in sinus rhythm. There was a tendency towards a better result of surgery in the paroxysmal AF patients. Acute pulmonary vein exit block was present in 6 patients, absent in 14 patients, and not tested in 4 due to refractory AF. There was no correlation between the presence of an acute PVB and the result of heart rhythm at one-year follow-up. In the patients with PVB block, 5/6 (83%) had sinus rhythm at follow-up, compared to 11/14 (78%) of the patients with no PVB at surgery (p=.438).

CONCLUSIONS Totally endoscopic ablation is a feasible and safe method of epicardial ablation with acceptable results. Pulmonary vein exit block after ablation does not predict the heart rhythm status at twelve months.

O45-7

INFLUENCE OF ATRIAL INCISION FOR ATRIAL FIBRILLATION SURGERY COMBINED WITH MITRAL VALVE SURGERY - COMPARISON BETWEEN SUPERIOR SEPTAL APPROACH AND LEFT ATRIAL APPROACH -

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Superior septal approach (SSA) can provide a larger operative field than conventional left atrial approach (LAA) even when the left atrium is small. We examined a result of atrial fibrillation surgery (Maze procedure) combined with mitral valve surgery using SSA and LAA. The subjects of the study were 72 patients who had Maze procedure combined with mitral valve surgery from 1999 to 2012. The surgeons used either SSA (42 patients, Group-A, 63±9 yrs, 23 male, 19 female) or LAA (30 patients, Group-B, 65±15 yrs, 13 male , 17 female) . Twenty-two patients in the Group-A had MVR (concomitant operation: 5 AVR, 9 TAP, 1 CABG and 1 VSD closure), and 20 had mitral valve plasty (concomitant operation: 3 AVR, 10 TAP, 2 CABG and 1 LV plasty). Eighteen patients in the Group-B and MVR (concomitant operation: 2 AVR, 1 TAP, 1 CABG), and 12 had mitral valve plasty (concomitant operation: 4 AVR, 3 TAP, 1 CABG, 1 LV plasty and 1 ASD closure). Preoperative left atrial size (dimension (mm)) was 53.7±10 in Group-A and 53.3±7.7 in Group-B, NS. The mean follow-up period was 54±40 months (range, 4 to 158 months). Conversion rate from Af to sinus rhythm in Group-A was 17/42 (40%) lower than 23/30 (76%) in Group-B (P=0.002). Two patients in Group-A had comlete A-V block needed pacemaker implantation. No patient in Group-B had comlete A-V block. ICU stay in Group-A was 3.7±1.9 longer than 2.8±2.2, (P=0.056). Postoperative left atrial size in Group-A was 53±5 larger than 47.5±4.3 in Group-B (P=0.009) (CONCLUSIONS) In Maze procedure conbined with mitiral valve surgery, SSA induced Comlete A-V block more frequently than LAA. Success rate to sinus rhythm was lower in SSA than in LAA. Postoperative left atrial size was lager in SSA than in LAA.

O45-8

WITHDRAWN

O45-9

PURSE-STRING PV BOX ISOLATION: A LESS INVASIVE MODIFIED MAZE PROCEDURE FOR NON-MITRAL PAROXYSMAL ATRIAL FIBRILLATION

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[Introduction]: Although less invasive procedure for atrial fibrillation (AF) such as catheter ablation or minimally invasive surgery diminished AF with high success rate, several problems still remain unsolved, including repeat sessions or uncertainly of ablation tools. We have performed surgical PV Box isolation (PVBI) for AF combined with mitral valve disease (MVD) with good success rate, however, PVBI for non-MVD is invasive because of its incision line. We have developed less invasive surgical procedure, purse-string PBVI with certain "clamping" ablation line for non-MVD AF.

[Method]: Seven non-MVD paroxysmal AF (pAF) cases (3 ASD, 2 AVR 1 TVR and 1 OPCAB) that have indication for surgical intervention, were received PVBI. Box ablation line was created by using bipolar radiofrequency surgical device, which can create a long continuous transmural lesion with clamping manner. At first, bilateral epicardial PV isolation line was made and second, upper and lower connecting line was added without incision of left atrial wall using purse-string technique: one jaw of Isolator was inserted into the left atrium (LA) through the purse-string suture on the right PVs and another was onto epicardium of LA toward the left PVs through the oblique and transverse sinus. After clamping the jaws, left and right PV isolation line was connected with box shape. All patients were received continuous monitor ECG (in hospital) and Holter ECG of every 6 month (after discharge), AF recurrence was estimated by more than 5 minutes duration.

[Result]: No complications or death were procedure related. At discharge, freedom from AF was 86%. In the patients of AF free at discharge, 100% of patients were free from pAF at averaged 10 months follow-up.

[Conclusion]: Purse-string PVBI can be a less invasive and effective procedure for non-MVD pAF.

P1-1

SPONTANEOUS LAD DISSECTION IN A 42 YEAR OLD HEALTHY WOMAN WITH NO PREDISPOSING FACTORS AND ITS SUCCESSFUL TREATMENT: A CASE REPORT

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Spontaneous coronary artery dissection (SCAD) leading to acute myocardial ischemia is a rare, but an often fatal clinical entity. The exact etiology remains unknown. Left undiagnosed, this condition has a 40% mortality. We report the case of a 42-year old woman (with no predisposing factors of LAD dissection) who presented to the ER with severe retrosternal chest pain, on evaluation was found to have an ST-elevated anterior myocardial infarction (STEMI). Treatment modalities include off -pump and on-pump cardiac revascularization, and percutaneous coronary intervention. The choice of treatment depends on case presentation, however, beating heart myocardial revascularization is associated with better outcomes since it reduces the risk of iatrogenous aortic dissection.

P1-2

RELATIONSHIP BETWEEN STRESS AND CORONARY HEART DISEASE

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OBJECTIVE: Coronary heart disease (CHD) is the leading cause of death worldwide and accounts for 13.7% deaths in countries like Pakistan. Its association with psychological stress, as one of the contributors to ischemic heart disease, is not well considered in our setup. Patients with CHD may have a high prevalence of stress, which may increase the risk of adverse surgical outcomes.

The objective of the study was: To ascertain The Prevalence of stress in coronary artery disease patients and to find a relationship between stress and CAD in patients admitted for CABG.

METHODOLGY: Data collected for 60 patients with coronary artery disease admitted to Civil Hospital Karachi for Coronary artery bypass graft surgery (CABG), from January 1st to March 31st year 2012, was evaluated using a stress evaluation scale [Holmes, TH and Rahe, RH Booklet for Schedule of Recent Experience (SRE), University of Washington, 1967]. The collected data was analyzed and results computed and evaluated for statistical significance using Z scores and ANOVA test.

RESULT: Stress, of varying degree, was found to be a significant independent predictor in patients with CHD. Analysis of our collected sample (N=60) of patients with stress showed that 60% had high stress (Z=2.23, p=0.025) and 36.7% with moderate stress (p=0.0025). An appreciable relation between degree of stress and patient's age (P= 0.01), Gender (p=0.059), BMI (p=0.04), incidence of myocardial Infarction (p=0.004), blood group and any addiction has been found.

CONCLUSION: Our study concludes a consistent evidence of an independent causative association between psychological stress and CHD, which is found to be of similar order to the more conventional CHD risk factors.

We recommend a comprehensive psychological evaluation and management of heart surgery candidates and post bypass patients, in an attempt to ameliorate the cardiovascular outcomes in these patients and improve their quality of life.

P1-3

CORONARY ARTERY BYPASS GRAFTING FOR PATIENTS WITH LEFT VENTRICULAR DYSFUNCTION

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Background: Since the procedure for coronary artery bypass grafting (CABG) has been well established, surgical mortality is decreasing. But surgery for patients with low ejection fraction (EF) is still high risk. Stitch trial demonstrated that CABG had lower rates of death from cardiovascular causes than medical therapy alone in patients with coronary artery disease and left ventricular (LV) dysfunction. We report our experience comparing impaired LV function patients with preserved patients and show our surgical strategy for patients with coronary artery disease and LV dysfunction.

Methods: We had 134 patients performed CABG between 2011 and 2012. We studied 16 patients with an EF of 35% or less [Group A: 67.1 years old, average EF 26.8%] and 118 patient of over 35% [Group B: 66.9 years old, average EF 60.5%].

Results: There were statistically significant differences between Group A and B in the percentage of off-pump CABG (63% vs. 97%, $p<0.01$), percentage of extubation at operating room (38% vs. 62%, $p=0.015$). We had 2 hospital deaths, both of which were performed emergency operation for acute myocardial infarction. There was no hospital death in patients performed elective operation. There was no neurological complication.

Conclusions: In our strategy for patients with coronary artery disease and LV dysfunction, we prefer complete revascularization grafting as many grafts as necessary without LV plasty since we believe that one of the most beneficial points of CABG is being free from secondary cardiovascular events rather than recovery of LV function. Off-pump CABG is the first choice to avoid neurological complication. In severely impaired LV function ($EF<20\%$) patients, we consider on-pump-beating CABG. To perform safe operation, preoperative management is important. We manage congestive heart failure severely adjusting body weight before operations. CABG for patients with LV dysfunction is safe procedure and the results were acceptable with well-considered management.

P1-4

microRNA-145 PREVENTS INTIMAL HYPERPLASIA IN RABBIT VEIN GRAFT DISEASE MODEL BY REGULATION OF SMOOTH MUSCLE CELL PHENOTYPE

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Objective

Intimal hyperplasia is the major cause of vein graft disease. Proliferation and migration of smooth muscle cells(SMCs) into the intima are key mechanism in this process. Recent studies have revealed that microRNA-145(miR-145) is a specific mediator in the regulation of proliferation and differentiation, and phenotype of SMCs. We sought to investigate the impact of miR-145 on intimal hyperplasia in rabbit model of vein graft disease using electroporation-mediated gene transfer.

Methods

Right jugular vein of male Japanese white rabbit was harvested and endothelial cells of the graft were injured by balloon catheter. Vein graft was transduced with miR-145 encoding plasmids by electroporator and interposed in ipsilateral carotid artery. Two or four weeks after surgery, venous graft was explanted and obtained sections were stained with hematoxylin and eosin, and elastica van Gieson for elastic fiber staining. Intimal thickness and intima/media area ratio were evaluated. Furthermore, two weeks after implantation, immunohistochemical investigation using mature smooth muscle marker myosin heavy chain smooth muscle-1 and -2(SM-1 and SM-2) and proliferation marker Ki-67 were performed in order to study the degree of differentiation and proliferation of SMCs.

Results

MiR-145 transduction significantly reduced neointimal thickness at both two and four weeks (2wks; 52.1±15.7 vs. 113.2±26.9 μm, $P<0.05$, n=6: 4wks; 42.4±4.8 vs. 136.5±38.3μm, $P<0.05$, n=8), and intima/media area ratio at four weeks (0.22±.04 vs 1.13±0.23, $P<0.01$, n=8) compared to the grafts without receiving gene transfer. Immunohistochemical investigation revealed that miR-145 transduced grafts contained more SM-2 positive mature SMCs and less Ki-67 positive proliferating cells.

Conclusions

We conclude that non-virus mediated transfer of miR-145, which specifically regulates SMC phenotype, into the bypass graft via electroporation would be promising to prevent intimal hyperplasia in vein graft disease.

P1-5

THE EVALUATION OF GRAFTS AND ISCHEMIC AREAS AFTER CABG BY CT AND SCINTIGRAPHY

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OBJECTIVE: We usually evaluate coronary artery system without consideration of myocardial function before and after coronary artery bypass grafting (CABG). For better revascularization, the evaluation of myocardial ischemia is actually important. We have evaluated grafts on computed tomography (CT) or coronary angiography (CAG), and myocardial ischemia on scintigraphy about three months later after CABG. We examined relationship between patency of grafts and myocardial function. METHODS: From January 2007 to August 2012, 296 patients underwent first isolated CABG (Off-pump 250 patients (84.5%)). Patients with both evaluations by postoperative CAG or coronary CT, and scintigraphy were 197(66.6%). In situ grafts' anastomoses were 241 (ITA: 228, GEA: 13), and free grafts' anastomoses were 416 (RA: 57, SVG: 359). We judged bypass with more than 50% stenosis including string sign or occlusion as stenotic bypass. We examined results of both evaluations, intraoperative graft flow, and degree of coronary stenosis. RESULTS: in situ graft: Seventeen ITAs (7.5%) were stenotic bypasses. There was no relationship between graft stenosis and ischemia on bypassed area, old myocardial infarction (MI), or intraoperative graft flow. When target vessel shows moderate degree of stenosis (≦ 75%), grafts had been significant highly occluded (p=0.004). free graft: Four RAs (1.0%) and 41 SVGs (9.9%) were stenotic bypasses. Targeted area by stenotic bypass had highly revealed ischemia(24.4%, p=0.0005), and bypasses to MI were highly closed (20.8%, p=0.02). Intraoperative graft flow of stenotic bypasses was lower than patent bypasses (29.1±29.0 : 49.0±30.6 ml/min, p<0.0001). When target vessel shows moderate degree of stenosis, grafts had been significant highly occluded (p=0.013). CONCLUSION: The degree of proximal stenosis alone related with graft patency in situ grafts. In free grafts, viability and largeness of perfusion area also related with graft patency. To grasp coronary artery system and myocardial function at the same time will contribute to better revascularization.

P1-6

USE OF INTERNAL MAMMARY ARTERY IN CORONARY ARTERY BYPASS SURGERY, ITS FLOW IN DIFFERENT AGE GROUPS AND DIFFERENT DISEASES

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Introduction: Ischemic heart disease is the leading cause of death and major disability all over the world. Many of these patients need surgical treatment. The left internal mammary artery (IMA) is the most commonly used arterial conduit for revascularization of heart. Its superiority has been shown over saphenous vein graft in terms of long term patency, better survival and low chances of degeneration. But low IMA flow associated with early haemodynamic collapse and produces impact on morbidity and mortality. Therefore we design a study to review IMA flow in different age groups and different diseases. So one can decide which group have low flow and care should be taken in these patients before using the IMA.

Material and methods:

Prospectively collected the data of 158 patients in whom the internal mammary artery was used for revascularization of heart during the period, from Jan 2011 to Sep 2012 in our institute by a single surgeon. Under controlled haemodynamic conditions, free flow was measured after the artery was divided distally 1cm before bifurcation.

Results:

Male patients were 82% with mean age of 52±8 years. There was no significant difference between male and female with p value of .097, diabetes mellitus with p=.4 and no difference smokers. There were significant higher flow in non-obese then obese patients p=.04, hypertensive patient have higher flow then non hypertensive p=.016 while the systolic pressure was same during study and there was a significant higher flow in age group between 50 to 60 years.

Conclusion: We therefore concluded care must be taken in using IMA in obese patients, non-hypertensive and in very young and very old age group of patients. Further study is warranted.

P1-7

LEFT DOUBLE-PATCH MOLD TECHNIQUE TO TREAT VENTRICULAR SEPTAL PERFORATION DUE TO ACUTE MYOCARDIAL INFARCTION

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OBJECTIVE: The objective of closing a ventricular septal perforation (VSP) caused by acute myocardial infarction (AMI) is to achieve complete closure without residual shunt flow during the acute and chronic phases and to maintain adequate left ventricular volume to avoid low output syndrome. We describe a patient in whom a VSP was closed with a left double-patch technique.

METHODS: An 86-year-old female was transferred to our institution with diagnosis of VSP due to AMI. She underwent emergency surgery on day 9 after the onset of AMI. The VSP was exposed through a left ventricular incision beside the diagonal branch after cardiac arrest was achieved. The perforation was initially closed directly with a small bovine pericardial patch and then a large bovine pericardial patch was attached over the septum and the first patch from the basal portion to the incision of the left ventricle with a suture on the non-infarcted tissue. The patches were fixed and molded along the left ventricular wall by injecting gelatin resorcin formal glue between them.

RESULTS: Despite requiring prolonged ventilation, temporary mechanical circulatory support and hemodialysis, the patient was weaned from all mechanical support and discharged with good left ventricular function without residual shunt flow.

CONCLUSIONS: The left double-patch technique with one patch fixed on normal tissue and molding to the shape of the left ventricle seemed to effectively exclude the infarction site and avoid residual shunt flow as well as an over-reduction of left ventricular volume. We consider this an alternative technique for closing VSP due to AMI.

P2-1

IN-VIVO STUDY BETWEEN SAFETY AND EFFICACY OF ORAL FIBRINOLYTIC, VEIN LIGATION, AND THROMBECTOMY IN MANAGEMENT OF SEVERE PHLEGMASIA CERULEA DOLENS (PCD) IN THE LOWER LIMB

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BACKGROUND.Most common initial treatment for DVT, thrombolytic therapy seems to be favorable for the valvular integrity and function with minor postphlebitic sequels. Unfortunately, severe DVT with leg swelling, cyanosis, gangrene, and pain which called Phlegmasia Cerulea Dolens (PCD) can lead to dead. PCD is a fulminant condition of massive venous thrombosis that may result amputation or death unless treated in an early phase. Therefore, rapid management should be done with best treatment. OBJECTIVES.Understanding fittest treatment for patient with severe PCD according based on hospitalization time, survival time, and also considering safety reason, limitation, and postoperative complications. METHODS.We have observed 5 patients with surgical thrombectomy via minimum femoral skin incision. In pre-operative management, the patients were kept in the anti-Trendelenburg position to prevent PTE. Blood flow was blocking by catheter, and thrombectomy has been done by catheter inserted parallel to the blocking catheter. We compared with 12 patients using daily oral fibrinolytic, streptokinase. RESULTS.While surgical thrombectomy was done carefully according to preoperative procedures, the major complications can be minimized. General anesthesia was maintained with positive-pressure mechanical ventilation. There wasn't major postoperative complications, such as PTE or peritoneal bleeding, and no cases of post-thrombotic syndrome after 22 months of follow-up. CONCLUSION.At present, it hasn't definitely been proved that one of the commonly used fibrinolytic drugs, streptokinase, urokinase and r-TPA take advantages in terms of efficacy and safety. Surgery using thrombectomy or vein ligation also have difficulty and limitation. Major postoperative complications such as PTE and peritoneal bleeding should be controlled. Surgery was considered for patients with persistent PCD, despite thrombolytic therapy.

Keywords: Fibrinolytic, Phlegmasia Cerulea Dolens, Deep Vein Thrombosis, Thrombectomy

P2-2

THE EFFICACY OF MINIMALLY INVASIVE ENDOSCOPIC GRAFT HARVESTING PROCEDURE WITH RE-USABLE DEVICES

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OBJECTIVE, In the North America, more than 50% CABG cases are indicated minimally invasive endoscopic graft harvesting technique when they harvest the radial artery (RA) or Saphenous vein graft (SVG). On the other hand, in our country, this technique is not so common. We suspected the reason why that former endoscopic graft harvesting devices which have been announced are only single-used tool. We cannot say they are economical devices. Then we developed the new procedure for minimally invasive graft harvesting technique with KARL STORZ-ENDOSKOPE system (KARL STORZ GmbH&Co. Germany) which can be disinfected and Harmonic Scalpel (Ethicon Endo-Surgery Inc. Cincinnati, Ohio USA). We evaluated the efficacy of this procedure.

METHODS, RA HARVESTING ; 79 CABG cases were indicated endoscopic RA harvesting method with above procedure. 76 CABG cases were performed by OFF-PUMP CABG. 3 cases were performed by On-Pump beating CABG. Male: Female = 49:30. 2 skin incisions (1cm or 2cm) were made on the patient's arm. SVG HARVESTING ; 59 CABG cases were indicated the same endoscopic method. Single surgeon was performed all these harvesting procedure.

RESULTS, Mean harvest time was 32.1 ± 8.6 minutes. Mean RA harvested length was 20.1 ±3.1 cm. 71 cases were performed postoperative angiography, then all grafts were patent and there were no anastomotic stenosis. There were no significant nerves parentheses' with all patients' arm that RA was harvested. There was no conversion from the endoscopic graft harvesting technique to the conventional method.

CONCLUSIONS, We think that these results of this harvesting procedure are acceptable. At our hospital, it is on the Routine Basis in this moment and this technique gave a great benefit to the patients who are needed CABG. We suspect that this harvesting procedure may have the endoscopic graft harvesting technique spread to our country, because of economical and less invasive.

P2-3

PORT-ACCESS MINIMALLY INVASIVE CARDIAC SURGERY FOR PATENT FORAMEN OVALE COMPLICATED WITH PARADOXICAL CEREBRAL EMBOLISM

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It is known that a paradoxical cerebral embolism is caused by a thrombus through a patent foramen ovale (PFO). Herein we report 2 cases of minimally invasive surgery (Port-access surgery) for a PFO complicated with paradoxical cerebral embolism.

[case.1]
The patient was 63-year-old man. He had motor aphasia and right side hemiplegia due to transient ischemic attack (TIA). He also presented typical features of deep venous thrombosis (DVT) of the right lower extremity. An echocardiography clearly showed the blood flow passing through the PFO followed by Valsalva maneuver. TIA was diagnosed to result from paradoxical cerebral embolism through PFO.
[case.2]
The patient was 50-year-old woman. She had headache due to cerebellum infarction. The computed tomography scan showed a pulmonary embolism due to DVT of the lower limb. The blood flow passing through the PFO followed by Valsalva maneuver was point out with an echocardiography. Paradoxical cerebral embolism due to PFO was diagnosed.

Several methods were considered to prevent recurrence of cerebral infarction or TIA, and direct closure of PFO by port-access cardiac surgery was selected for secure treatment. Postoperative echocardiography showed no residual shunt in both cases. They started walking on the day of surgery. They were discharged at 11 days and 12 days, respectively, after surgery without any complications.

It is considered that a paradoxical cerebral embolism caused by a PFO is not rare as an origin of cerebral infarction even in patients without cardiac disease or arrhythmia. The cardiac surgery of median sternotomy for PFO with no symptom is invasive. Therefore we consider that the surgical PFO closure by the port-access technique should be a feasible alternative technique.

P2-4

ENDOSCOPIC HARVEST OF RADIAL ARTERY WITH THE USE OF NON-DISPOSABLE SYSTEM

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OBJECTIVE

Radial arteries (RA) have been proved excellent conduits for myocardial revascularization. The use of RA for myocardial revascularization has excellent results. Conventional open technique for RA harvesting, however, has an undeniable disadvantage; that is a big incision in the forearm. Endoscopic approach to harvest RA would overcome it, including less wound and neurological complication, improved aesthetics. Currently non-disposable system for RA harvesting is commercially available in Japan. We present the technique to harvest RA using this system and show the tips and pitfalls, with its usefulness and advantage.

METHODS

RA was harvested endoscopically with 32 patients (27 men, 5 women, age: 67.4+/-8.8 y.o.) during September 2009 to August 2012 for coronary artery bypass grafting, using BISLERI Endoscopic Radial Artery Harvesting System (Karl Storz, Germany) and vessel sealing equipment. Through two small incisions, RA was harvested in a pedicle fashion under endoscopic view without using CO2 inflation or arterial compression. All RA were used for coronary artery grafting (on pump arrest CAB: 22, on pump beating CAB: 9; including concomitant AVR, off-pump CAB: 1). Target coronary arteries were the following; left anterior descending: 1, diagonal: 9, high lateral: 2, obtuse marginal: 5, posterolateral: 12, posterodescending: 1, ateroventricue node: 2.

RESULTS

The length of RA was 17.2+/-1.3 (14.0-20.0) cm. Harvesting time (from skin incision to resection) was 37.0+/- 9.5 (25-60) min. there were no neurological complications (pain, numbness, paresthesia) and no wound complications (cellulitis, infection). Hematoma in two cases disappeared at discharging. 31 RA grafts were evaluated with computer tomography (30) and angiography (1) in one month after the surgery. All grafts were patent. Some grafts were evaluated microscopically and their intima was intact.

CONCLUSIONS

Endoscopic RA harvesting can be done safety and quickly with infrequent complications, improved esthetics and good early patency. We consider it useful as an alternative method.

P2-5

SUCCESSFUL TEVAR FOR RUPTURED THORACIC AORTIC ANEURYSM IN THE ELDERLY WITH COMORBIDITIES

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[BACKGROUND] When elderly people with comorbidities have been referred for ruptured thoracic aortic aneurysm (rTAA), it may be judged by the age or its comorbidities that a conventional open surgery with CPB is impossible. TEVAR has emerged as an alternative to open surgery.

We report three successful TEVAR performed for rTAA in the elderly with comorbidities.

[METHODS]During the period in April, 2012 to August, 2012, in our hospital, there were four urgent TEVAR for rTAA. All of them were survived. In them, there were three elderly people (75 or more year-old) with comorbidities.

[CASE 1] A 93-year-old- woman with renal dysfunction was taken to the emergency room due to severe back pain. She was diagnosed as 5.7 g/dl of hemoglobin level and rTAAA (Crawford V type). Urgent visceral debranching TEVAR (Celiac a., SMA) was performed after making a general condition improve. On day 15, she was discharged to home.

[CASE 2] A 75-year-old man with a history of CABG (patent LITA-LAD and SVG-OM), TEVAR for distal arch, and cerebral infarction, who presented to the emergency room at massive hemoptysis.

It was diagnosed as the stent graft dislodgement, 80 mm of saccular rTAA. Urgent debranching (LtCCA, LtSCA) TEVAR was performed. On day 17, he was discharged to home.

[CASE 3] A 87-year-old man. Vomiting by an esophageal transit obstacle and aspiration pneumonia were repeated from one-month before. He was taken to the emergency room by diagnosis of impending rTAA (90 mm, saccular). Urgent TEVAR was performed. On day 2, he could walk. Feeding-tube was endoscopically inserted on day 3, and a tube feeding started.

On day 36, he was discharged to home.

[CONCLUSION] TEVAR for rTAA is an effective option in the elderly with comorbidities. Prudent follow-up is due to continue.

P2-6

RE-EVALUATION OF MIDCAB FOR CAD

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<Background> As ordinary median sternotomy approach of CABG might be hesitating in case of LAD single vessel disease, "minimally invasive approach" could be expected. We examined the series of MIDCABs for its utility and reliability.

<Methods> We retrospectively evaluated 18 patients undergoing MIDCAB between April and November in 2012. All the cases were approached by LAST (Left anterior small thoracotomy) through 4th intercostal space under general anesthesia (one lung ventilation). LIMA was harvested in the pedicle fashion and anastomosed on the mid portion of LAD with 8-0 monofilament suture on beating heart. Graft's patency was examined by coronary CT scan postoperatively.

<Results> There were consecutive 18 MIDCAB cases out of 114 cases of isolated OPCABs. Sixteen cases were male and 2 of female, and mean age was 69±12 years old. Operation time was 157±28 minutes on average. In 2 cases composite graft with IEA/SVG was necessary due to the poor quality of LIMA graft. Average amount of intra-operative blood loss was 166±117ml, and no blood transfusion was necessary in all cases. Postoperative course was uneventful in all cases and there were neither major morbidity nor hospital mortality. Coronary CT scan was performed on day 2 which demonstrated the graft patent in all cases. All the patients discharged on day 4.

<Conclusions> Short term results of MIDCAB were satisfactory. MIDCAB might be the alternative strategy to ordinary OPCAB or PCI for LAD single vessel disease.

P3-1

TOWARD POD-0 FAST-TRACK PROTOCOL AFTER CARDIAC SURGERY: A PILOT STUDY

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Early start of post-operative rehabilitation has been acknowledged to have advantages in minimizing complications and hospital cost after surgery. We planned a pilot study, which consisted of initiating bedside rehabilitation 2 hours after simple cardiovascular operations to confirm the safety and better outcome than our conventional next day start program.

Among 452 cardiovascular operations between April, 2011 and August, 2012, 64 elective simple cases were included in this study: average 72.1 years, 48 males; 34 CABGs, 16 valve operations and 14 aortic operations. Excluded were the patients with emergency, combined surgery, hemodialysis, intra-tracheal tubes, or arterial connections. Those who entered ICU after 3 pm were neither enrolled due to manpower reasons.

None of the patients had serious changes in hemodynamics, respiration or drainage volumes. The patients were divided into 2 groups: Group-S; standing (14) or sitting on the bed (13) and Group-G; Gatch-up position only (37). Group-S had significantly shorter durations in operation (219 vs. 243 min, p=0.05), anesthesia (276 vs. 303min, P=0.03) and catecholamine administration (0.7 vs. 10 hr., P=0.02). Group-S also had significantly higher Barthel Index, which represents ADL, on POD 3 (83/100 vs. 71/100, p=0.03) and longer walking distance at discharge from the hospital (510 vs. 339 m, P=0.01).

Those data suggested that rehabilitation 2 hours after cardiovascular surgery is safely feasible and effective. We have now started more aggressive protocol to encourage patients to have either standing or sitting position, on the day of surgery, even after combined operations.

P3-2

WHAT ARE PREDICTORS OF BLEEDING OR DELAYED TAMPONADE AFTER CARDIAC OPERATION?

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(OBJECTIVE)Rethoracotomy because of massive bleeding or delayed tamponade after cardiac operation have a huge effect on patient's postoperative course.Needless to say,postoperation of great vessels or repeat surgery have high risks of massive bleeding,but AVR for aortic stenosis(AS) has also high rates of rethoracotomy despite its property of less-invasive and short time operation. We examined the risks or predictors of bleeding or delayed tamponade after cardiac operation.

(METHODS)Between January 2010 and December 2011, 396 consecutive patients who underwent cardiac or great vessel surgery at our institute are included. We reviewed retrospectively all the patients who had massive bleeding(Group B), or delayed tamponade(Group D).And in this study,we narrow our focus on valvelar surgery to evaluate what are the factors of bleeding or delayed tamponade.

(RESULTS)During the study period,of the 396 patients,125 were CABG,84 were great vessel,157 were valvelar,and 27 were the others.Each number of Group B and D were respectively CABG[B:11(7.0%) D:1(0.8%)],Great vessel[B:13(15.4%) D:8(9.5%)],Valvelar[B:11(7.0%) D:14(8.9%)],the others[B:5(18.5%) D:0(0%)].We furtherly focused on 157 valvelar patients and investigated the detailed cause of bleeding or delayed tamponade.Of the 157 patients,25 patients were underwent rethoracotomy because of bleeding or delayed tamponade.We picked up these 157 patients diagnosis,HD dependents or not,surgical procedure,operative time,CPB time,drain selection,last 24 and 8 hours drain loss,pacemaker lead remove day,start day of anticoagulants,peak INR,use of antiplatelets,preoperative platelet counts,reincrease CRP,needs of intraoperative transfusion.As a result,AS patients have singnificantly high risks of rethoracotomy. There's no significant difference in the intraoperative factors.Preoperative platelets were significantly low in the patients with massive bleeding.And the patients with delayed tamponade,they have preoperative low platelets,singnificantly many loss of last 24 hours drain.All tamponade patients have reincrease CRP before having symptoms of tamponade.

(CONCLUSIONS)AS patients have singnificantly high risks of rethoracotomy.Preoperative platelets and last 24 hours drain loss have possibility of important rolls to decrease bleeding rethoracotomy and improve patients hospital days.

P3-3

FREQUENCY OF DEVELOPMENT OF POSTOPERATIVE RENAL DYSFUNCTION AND ITS EFFECTS ON OUTCOMES AFTER OPEN HEART SURGERY: A PROSPECTIVE STUDY

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INTRODUCTION: Postoperative renal dysfunction (RD) has been shown to be a harbinger of poor prognosis after open heart surgery (OHS). The morbidity of RD after OHS is 10-30%. On the basis of its severity, the operative procedure and its postoperative duration, it may result in varying adverse outcomes which may range from renal impairment requiring dialysis, sepsis and prolonged usuage of inotropes,ventilation, ICU/hospital stay or death. Many studies have described the results of CABG alone in patients with RD, but there is very limited literature on OHS as a whole.

OBJECTIVES: To determine the frequency of development of RD and its effects on outcomes within 30-days in patients undergoing OHS at The Aga Khan University Hospital, Pakistan (AKUH).

METHODOLOGY: A case series was conducted on patients undergoing OHS at AKUH from Nov 2011 to Jul 2012. Laboratory readings of serum creatinine was noted and the glomerular filtration rate was calculated by the Cockcroft-Gault equation to measure RD. Hospital course was charted for demographic and clinical characteristics and after discharge patients were followed up for 30-days after surgery. Presence of any of the outcomes of morbidities or mortality were noted.

RESULTS: We studied 145 patients having mean age of 58.9±11.9 years. 11.7% were female; 62.1% were hypertensive and almost half had dyslipidemia. 3.4% had a history of "preoperative" RD. Majority belonged to moderate ejection fraction group (41.4%). Outcome analysis showed 37.2% had postoperative RD on 30-days after OHS. Prolonged inotropic requirement was 42.8%, dialysis/renal replacement therapy requirement was found in 6.2% and the mortality was 5.5%.

CONCLUSION: Our study shows, development of RD after OHS leads to adverse outcomes. The preoperative health of the kidneys is of prime importance and optimization is required preoperatively as well as perioperatively as it may lead to development of adverse outcomes of morbidities and mortality.

P3-4

THE INFLUENCE OF MODERATE HYPOTHERMIC CIRCULATORY ARREST FOR DYSFUNCTIONAL KIDNEY IN THORACIC AORTIC SURGERY

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[Background]The risk of developing renal dysfunction after thoracic aortic surgery has been described. It seems that preoperative renal dysfunction and prolonged circulatory arrest time have been related with postoperative renal dysfunction. [Objective] To investigate whether moderate hypothermic circulatory arrest and/or pre-existing renal dysfunction influence post operative renal function in patients undergoing thoracic aortic surgery. [Methods]Between 2003 September and 2012 August, 199 consecutive patients underwent replacement of thoracic aorta with moderate hypothermic circulatory arrest. Patients were divided into three groups: those with eGFR (ml/min/1.73 m2) $\geqq$ 60 (Group N: n=110), those with 30 $\leqq$ eGFR<60 (Group M: n=77), and those with eGFR<30 (Group S: n=12). We assessed serial change in eGFR (preoperative, minimum value during postoperative hospitalization , before discharge, and one year after surgery).[Results]The age was significantly higher and the ejection fraction was significantly lower in the Group S than those in the Group M and Group N. The other characteristics were not significantly different among three groups. Transient decrease in eGFR was observed after surgery and eGFR recovered during hospitalization in all groups. The eGFR maintained one year after surgery in the Group S and M. In the Group N, the eGFR was significantly lower within normal limit at one year after surgery than preoperative value. Five cases (2.5%) needed temporary dialysis treatment during postoperative period. Only a patient required chronic renal replacement therapy within one year after surgery, he suffered from IgA nephropathy and belonging Group M.[Conclusion]The use of moderate hypothermic circulatory arrest for thoracic aortic surgery may not influence renal function within one year after surgery.

P3-5

HYPOTHERMIA PRODUCES SIGNIFICANT DOWNREGULATION OF PROTEINS IN VARIOUS METABOLIC PATHWAYS IN THE RAT HEART

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<objective>Hypothermia is used in the clinic for protection of organs such as the brain against ischemic injury during aortic/complex congenital cardiac surgery or post-resuscitation encephalopathy. The principal mechanism of hypothermiac protection is suppression of metabolism, however, the pleiotropic effects of cooling are incompletely understood. Here, we used a rat model system to evaluate metabolic changes induced by deep hypothermia.<method> The hypothermia-induced changes were identified using fluorescence-based two-dimensional(2-D) difference gel electrophoresis(DIGE) and matrix-assisted laser desorption / ionization-time-of-flight (MALDI-TOF/TOF) tandem mass spectrometry. Rats were randomly assigned to a normothemic control group(37°C, n=6) or hypothermia group(23°C, n=6) that received surface cooling for 3hours. Heart(left ventricle) tissue was excised for assessment. Functional profiling of differently expressed proteins was performed as an enrichment analysis of Gene Ontology(GO) terms and pathways. <results>We found that the hearts of anesthetized rats with deep hypothermia showed significant down regulation of proteins involved in oxidative phosphorylation and cardiac muscle contraction.<conclusion>Our proteomic analysis demonstrated that deep hypothermia alone produced significant downregulation of proteins in various metabolic pathways in hearts of anesthetized rats.

P3-6

ASSESSMENT OF PROTECTIVE EFFECTS OF PHENIRAMINE MALEATE ON REPERFUSION INJURY IN LUNG AFTER DISTANT ORGAN ISCHEMIA: A RAT MODEL

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Objectives: Ischemia/reperfusion (I/R) injury of tissues is a common problem that is encountered in many surgical procedures including cardiovascular surgery particularly. The aim of this study is to investigate the protective effects of methylprednisolone (MP), a potent anti-inflammatory agent, and pheniramine maleate (PM)(an antihistaminic with also some anti-inflammatory effects) on reperfusion injury of lungs developing after ischemia of left lower extremity of rats.

Design: Twenty-eight randomly selected male Sprague Dawley rats weighing 320-370 grams were divided into 4 groups, each consisting of 7 rats.

Materials and methods: Group 1 was the control group. Group 2 was the sham group (I/R). Rats in Group 3 were subjected to I/R and given PM (Ph) and rats in Group 4 were subjected to I/R and given MP (Pn). A tourniquet was applied for one hour at the level of left groin region to subjects in I/R group after induction of anesthesia. Lungs of all subjects were removed after 24 hours. Extracted tissues were investigated regarding histological and biochemical parameters.

Results: Malondialdehyde (MDA) levels were significantly lower in Ph group than in I/R group ($p<0.05$). Superoxide dismutase (SOD) and glutathione peroxidase (GPx) enzyme activities were found to be significantly higher in Ph group than in I/R group ($p<0.05$). Histological examination demonstrated that PM had protective effects against I/R injury.

Conclusions: PM has a protective effect against ischemia/reperfusion injury in rat lung.

P3-7

CHANGES IN SPINAL SEGMENTAL ARTERY PRESSURE AND BLOOD FLOW DURING AORTIC CROSS-CLAMPING UNDER DISTAL PERFUSION: FOCUS ON CORRELATION WITH CHANGES IN SYSTEMIC BLOOD PRESSURE

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Objective: The aim of this study was to experimentally investigate blood flow supply to the spinal cord through a collateral network.

Method: Using a beagle dog, the site of the aorta from which the Adamkiewicz artery branches was clamped and a bypass of the clamp site was made with the aim of ensuring blood flow to the distal side of the clamp. The spinal dura mater in the L5 region was exposed and spinal cord tissue blood flow was measured with a laser blood flowmeter. Mean systemic blood pressure, blood pressure within the clamp site (substituting for spinal artery pressure), and spinal tissue blood flow rate were measured and the relations between them were investigated.

Results and Discussion: Positive correlations were seen between mean systemic blood pressure and clamp spinal artery pressure and between clamp spinal artery pressure and spinal tissue blood flow. The spinal cord was perfused from the collateral network from outside the clamp site and high systemic blood pressure of about 1.5-fold was needed to obtain the pre-clamping spinal tissue blood flow rate. Spinal artery pressure and spinal cord blood flow (in the L5 region) were both about one-fourth to one-fifth as a result of the bypass block and the collateral network was the major supply source of blood flow from the distal side.

P4-1

LEFT ATRIAL FUNCTIONAL EVALUATION FOLLOWING SURGICAL ABLATION OF ATRIAL FIBRILLATION: A PROSPECTIVE PILOT STUDY USING DUAL-SOURCE CARDIAC CT

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Background: Little is known about the extent of functional recovery in the left atrium (LA) following successful sinus rhythm conversion by the Maze procedure. This study aimed to evaluate postoperative LA function in patients with valvular atrial fibrillation (AF) undergoing the Maze procedure.

Methods: From March to May 2012, we prospectively enrolled 12 patients (aged 52.5 ± 10.1 years, 1 female) with valvular AF undergoing mitral valve surgery combined with the Maze procedure. These patients were randomly assigned to receive LA appendage (LAA) resection or preservation (6 vs. 6), and the parameters of LA function were evaluated using ECG-gated dual-source cardiac CT for those who restored sinus rhythm at 1 month and 6 months after surgery.

Results: There was no operative mortality or morbidity. At 1 month, 10 patients showed sinus rhythm restoration. Postoperatively, ejection fraction and emptying volume of the LA were 16.8±6.3% and 24.5±9.7mL, respectively, and they were not significantly different between LAA preservation and resection groups (P=0.92 and 0.60, respectively). These two values were significantly lower than normal reference values (P<0.001 for both values). Functional contributions of anterior, posterior and appendage compartments of LA were 74.6±23.7%, 3.9±8.3% and 21.5±16.1% for those with LAA preservation and 102.1±9.5%, -2.1±9.5% and 0% for those with LAA resection (P<0.05). At six months after surgery, all LA functional parameters showed similar results as for those at one month including low booster functions and similar functional contributions of each LA compartment.

Conclusion: Contractile functions of the LA were significantly decreased after successful sinus rhythm conversion by the Maze procedure, which persisted throughout late postoperative period. The influence of LAA preservation on postoperative LA functions needs to be evaluated through studies on larger populations.

P4-2

WITHDRAWN

P4-3

LONG-TERM RESULTS OF MAZE PROCEDURES WITH CONCOMITANT LEFT ATRIAL POSTERIOR WALL ISOLATION FOR CHRONIC ATRIAL FIBRILLATION

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OBJECTIVE: We have investigated the operative and long term results of Maze procedures by reviewing our institutional experience in patients (pts) with chronic atrial fibrillation (Af) who underwent radiofrequency ablation with or without isolating the left atrial posterior wall (Box lesion ablation).

METHODS: Between August 2004 and August 2012, 61 pts (65.8±8.9 years old; male/female: 36/25) underwent a Radial procedure with radiofrequency ablation, who were divided into two groups according to presence or absence of Box lesion (BL) ablation (Group BL, 28 pts; Group NB, 33 pts, respectively). Follow-up period was 36.8±23.3 months.

RESULTS: There was no operative or in-hospital death. The defibrillation rate was not significantly different between the two groups at a discharge (70.0% and 81.8% in Group BL and Group NB, respectively, P=0.32) or during the follow-up period (70.0% and 69.7% in Group BL and Group NB, respectively, P=0.74). The risk factors of Af recurrence in the follow-up period were the left atrium diameter (SR:50.9±7.8mm, Af:55.4±20.4mm, P<0.01) in Group BL, preoperative Af duration (SR:38.5±49.2 months, Af:125.2±110.3 months, P<0.01) in Group NB and f wave amplitude in lead V1 (SR:0.22±0.10mV, Af:0.15±0.05mV, P<0.03) in Group NB. Postoperative cardioversion for SR restoration tended to be more required in Group NB than Group BL (8 pts [40.0%] and 2 pts [15.4%], respectively, P=0.10).

CONCLUSIONS: "Box lesion" ablation in Radial procedure did not influence the long-term results, but had a tendency of less incidence of cardioversion for SR restoration in the early postoperative period. Box lesion ablation was not fully effective for pts with dilated left atrium.

P4-4

EFFECTIVENESS OF CARDIAC RESYNCHRONIZATION THERAPY WITH CARDIAC SURGERY IN SEVERE HEART FAILURE

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[OBJECTIVE]

Cardiac resynchronization therapy (CRT) is one of the therapeutic strategy for severe heart failure with dyssynchrony. Cardiac function and dyssynchrony evaluations are important for CRT, but it has not been reported about CRT with cardiac surgery. The purpose of this study was to evaluate effectiveness of CRT with cardiac surgery for cardiac function and dyssynchrony in patients with severe heart failure.

[METHODS]

Between July 2010 and October 2012, 10 severe heart failure patients who underwent CRT with cardiac surgery were experienced. Right and left ventricular and atrial epicardial leads were implanted after completion of intra-cardiac maneuver. In patients with chronic atrial fibrillation (AF) , Maze procedure was performed in order to eliminate AF. Atrio-biventricular sequential pacing on DDD was performed in all patients. To evaluate the improvement of cardiac function and dyssynchrony, the echocardiographic assessment was repeated on admission and 1 month after the CRT implantation.

[RESULTS]

There was no operative death. One patient of ischemic cardiomyopathy died of sustained ventricular tachycardia 2 month after the operation. All patients except 1 discharged on foot with improved NYHA class. Postoperative course was uneventful without any cardiovascular events. Echocardiographic parameters of dyssynchrony tended to improve. Cardiac function parameters were improved with statistical significance.

[CONCLUTIONS]

CRT with cardiac surgery is considered to be useful for cardiac function and dyssynchrony in patients with severe heart failure.

P4-5

PERMANENT EPICARDIAL PACING IN PEDIATRIC PATIENTS

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Background: The transvenous approach is used for cardiac pacing in adult, but in child the approach has to be designed with age, physical frame, growth and cardiac disorders.

Methods: We reviewed the findings obtained in our patients who underwent epicardial pacing during childhood.

Results: Epicardial pacing systems were implanted 29 times in 24 children from 1976 to 2012. 10 patients had congenital complete atrioventricular block (CAVB), one had second degree atrioventricular block, two had sick sinus syndrome (SSS), and 4 and 7 had CAVB and SSS after cardiac surgery for congenital heart disease, respectively.

Age at first pacemaker implantation ranged from 3 days to 15 years (median 3 years), and body weight ranged from 2.0 kg to 43 kg (median 15kg). Pacing mode was VVI in 14, DDD in 9 patients and CRT in 3 patients. 14 Screw-in leads were used in 11 patients and 27 steroid eluting leads were used in 13 patients since 1999. Approachs for lead implantation were median sternotomy in 7 patients, lateral thoracotomy in 6 patients and partial sternotomy in 11 patients. Most of generators were planted in left lateroabdominal subfascial space. Follow-up duration was 7 months to 25 years, and 8 patients were observed for over 10 years. There were no deaths related to the pacing system. One patient who had RV pacing for congenital CAVB developed dilated cardiomyopathy and underwent transplantation of the heart. Lead troubles occurred in 9 screw-in leads but not in steroid eluting leads. Two patients were transferred to the transvenous pacing system after the growth period. Dehiscences and infection of generator pockets were in three neonates.

Conclusion: It is reasonable to perform epicardial pacing, especially using steroid eluting lead, as long as possible in children in order to save their veins and endocardial space for use later in life.

P4-6

A RARE CASE OF INTRAOPERATIVE ELECTROANATOMICAL MAPPING-ASSISTED CARDIAC SURGERY IN INFANT: COMBINED SURGICAL RESECTION AND CRYOABLATION FOR THE VENTRICULAR TACHYCARDIA ASSOCIATED WITH GIANT FIBROMA

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Background: Pediastric patients with cardiac tumor have been reported manifesting ventricular tachycardia (VT). Tumor resection is primary treatment for VT. However, it has technical difficulty involved in extensive cardiac resections in some cases. We experienced a rare case of electrical-anatomical assisted surgical treatment of VT associated with cardiac tumor in infant.

Method: Chest was via opened median sternotomy. Cardiopulmonary bypass was instituted with bicaval and aortic cannulation. Electroanatomical mapping system was used to collect the local electrocardiogram on the surface of left ventricle including the tumor. Preoperative 3D-computed tomography imaging was imported on the mapping data to reconstruct the ventricular anatomy.

Results: Tumor occupied the lateral left ventricle and distorted circumflex coronary artery. The tumor was visually covered with muscular tissue, stretched out laterally toward atrioventricle gloove. Voltage mapping showed that left lateral tumor surface has a low voltage with fractionated potential, while the other surface has high voltage. Under cardiac arrested, the tumor was resected partially including low voltage area, then cryoablated circumferentially around resection line. The patient was fully recovered postoperatively with no VT. Pathological findings revealed a fibroma surrounded by myocardium.

Conclusion: Electroanatomical mapping system was useful to determine the appropriate resection line in the tumor in the treatment of VT.

P4-7

WITHDRAWN

P4-8

CLINICAL EVALUATION OF SAFETY AND EFFECTIVENESS OF BEPRIDIL FOR PERIOPERATIVE ATRIAL FIBRILLATION AFTER MAZE PROCEDURE WITH MITRAL VALVE SURGERY

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OBJECTIVE: Although perioperative atrial fibrillation (AF) is common even after Maze procedure, its treatment is poorly elucidated. Bepridil was shown effective for converting AF to sinus rhythm (SR), however, QT prolongation and life-threatening ventricular arrhythmia are major concerns. We analyzed the safety and effectiveness of low-dose bepridil after Maze procedure with mitral valve surgery. **METHODS:** Sixty-five patients (age: 66±9 years, AF duration: 6.8±6.8years, left atrial diameter: 59±9 mm) who underwent Maze procedure with mitral valve surgery via superior septal approach since March 2005 were studied. In 48 patients bepridil was administered (100-200 mg/day) after postoperative AF occurred (group B), and 10 did not (group N). In remaining 7 patients, AF did not occur. We studied AF conversion rate and adverse events in the two groups. **RESULTS:** There were no operative and hospital deaths. In group B, 32 patients (67%) pharmacologically converted to SR and 5 of remaining 16 patients (31%) converted to SR by direct-current cardioversion (DC). In group N, though 6 patients (60%) converted to SR, none of remaining 4 patients (40%) did not convert to SR by DC. Adverse events occurred in 7 patients in group B [bradycardia 4 (8%), liver dysfunction 1 (2%), ventricular tachycardia 1 (2%), and torsade de pointes 1 (2%)]. **CONCLUSION:** Although low-dose bepridil seems to be effective, caution remains regarding life-threatening ventricular arrhythmia with bepridil after Maze procedure with mitral valve surgery via superior septal approach.

P4-9

SURGICAL STRATEGIES AND THE OUTCOME FOR ATRIAL FIBRILLATION ASSOCIATED WITH ATRIAL SEPTAL DEFECT

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Objective: Surgical treatment of atrial fibrillation (AF) associated with atrial septal defect (ASD) as well as the ASD closure is essential in terms of cardiac function and in providing a better quality of life. Development of ablation devices promoted simplification in Maze procedure. However, little is known about the efficacy related to surgical strategies.

Method: A total of 24 patients with ASD (mean age, 53±10 years; 37% women) underwent full maze procedure (N=13) or simplified surgical procedure (N=11, right atrial incision plus pulmonary vein isolation) for the various types of AF (chronic AF in 13, paroxysmal AF in 11) as a concomitant procedure. Postoperative outcome related to the surgical strategies and a risk factor of the AF recurrences was examined retrospectively.

Result: Sinus rhythm was restored and maintained in 19 patients (79%) after a mean follow-up time of 85±58 months. There was no recurrence of AF in the patients with paroxysmal AF. Five patients (21%) required pacemaker implantation postoperatively. There was no significant difference in the sinus rhythm restoration rate between full maze group and simplified procedure groups (84% vs 72%). Logistic regression analysis showed that age was the only significant risk factor associated with recurrence of AF (OR=1.148 95%CI 1.005-1.229).

Conclusion: Simplified procedure using ablation devices provided acceptable outcome in the treatment of AF associated with ASD, while it had high incidences of sinus rhythm dysfunction postoperatively.

P4-10

EARLY EXPERIENCE OF THE SURGICAL REMOVAL OF INFECTED ENDOCARDIAL LEADS USING THE EXCIMER LASER SHEATH EXTRACTION SYSTEM

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Introduction: With the growing number of cardiac pacemaker (PM) and internal cardioverter defibrillator (ICD) implantation, endocardial lead infections have been increasing. The Excimer Laser Sheath Extraction System (ELSES) has been recognized as being highly useful for removing chronic infected leads; however, serious bleeding complications are a concern. Here we report our early experience of the surgical infected leads removal combined with ELSES.

Patients and Methods: Retrospective study of 4 patients who underwent the surgical removal of infected endocardial leads between 2009 and 2012. All 4 patients were male and an average age was 67.3±1.5 years.

Results: The mean duration from implantation to removal was 11.3±3.4 years. The first case was attempted with using ELSES in angiography room, though this was abandoned due to severe adhesion of the SVC and potential risk of perforation. Surgical leads removal was performed without using cardiopulmonary bypass. During surgery, we found a silent perforation of the innominate vein brought about by ELSES. About 2 cases of lead endocarditis with tricuspid valve regurgitation, infected leads were dissected from pocket to SVC using ELSES prior to surgery. Tricuspid valve replacement/plasty and lead removal were performed under cardiopulmonary bypass and proximal leads were removed smoothly. The 4th case was complicated with cardiac tamponade during the lead removal with ELSES. PCPS was emergently administered and perforation of the right atrium was repaired at operation room. There was no hospital death and infection was well controlled in all patients after leads removal.

Conclusions: ELSES was effective to remove infected endocardial leads, although the possibility for serious complications still exists. Understanding about the potential risk of perforation based on cardiac anatomy is important. This procedure should be performed in a properly equipped room for emergent bleeding complications and closed backup by cardiac surgeons is essential for performing this procedure safely.

P5-1

COMPARISON OF THE SHORT TERM OUTCOME OF OPEN SURGERY FOR TRUE ANEURYSM AND CHRONIC DISSECTION: CONTEMPORARY OUTCOME OF 225 DESCENDING AORTIC REPAIR

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OBJECTIVE:

The number of thoracic aortic endovascular repair (TEVAR) is increasing rapidly, and the clinical outcome largely depends on the underlying aortic pathology. So, careful assessment of the safety and efficacy of these alternative approaches will require comparison with standard open surgical repair. The purpose of this report is to compare the operative result of chronic dissection with that of true aneurysm.

METHODS:

We retrospectively reviewed and analyzed data collected from January 2007 to December 2011 regarding 225 consecutive patients who underwent open aortic repair electively with left thoracotomy for distal arch and descending aortic aneurysm in our institution.

RESULTS:

Of 225 patients, 104 patients(46.2%) had true aneurysm, and 121 patients(53.8%) chronic dissection. Chrnonic dissection patients were younger than true aneurysm patients. True aneurysm patients had significantly more comorbidities including chronic kidney disease, chrnonic obstructive pulmonary disease, coronary arterial disease. Marfans syndrome patients were more common in chronic dissection patients(3.3%) than in true aneurysm patients(0.96%). Previous aortic surgery was more common in chronic dissection patients(35.5%) than true aneurysm patients(26.9%). Overall operative mortality was 1.3%, and true aneurysm and chrnonic dissection patients were 0.96% and 1.6%.

CONCLUSIONS:

Our data suggests that open aortic repair for distal arch and descending aortic aneurysm can be performed with acceptable early outcomes, regardless of true aneurysm and chronic disseciton. TEVAR should not supersede the conventional open aortic repair in any aortic pathology.

P5-2

TRANSAPICAL AORTIC CANNULATION FOR ACUTE TYPE-A AORTIC DISSECTION

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Objective: There is still debate as to the optimal site of arterial cannulation for the repair of acute type-A aortic dissection. The most popular femoral cannulation with retrograde perfusion is known to have a potential risk of atheroembolism and organ malperfusion. Right axillary artery cannulation, although increasingly applied, requires more time, can be difficult if the artery is small or dissected. On the other hand, central cannulation site such as transapical is emerging alternative with excellent results.

Methods: Transapical aortic cannulation was performed in 57 patients (31 men and 26 women: mean age 63.5 years; 43 ascending, 7 hemiarch, 5 total arch, 2 aortic root repair) with acute type-A dissection in our medical center. After bicaval cannulation is established for venous drainage, a small incision is made in the apex of the left ventricle without a purse-string suture. A 24Fr wire-reinforced venous cannula is inserted through the incision of left ventricle and across the aortic valve to the ascending aorta under guidance of transesophageal echocardiography. For cerebral protection, hypothermic circulatory arrest with retrograde cerebral perfusion is performed.

Results: Transapical cannulation was successful in all patients. In two cases, femoral cannulation was added to improve the existing malperfusion. There were 3 in-hospital mortalities (5.3%) and 2 patients had strokes (3.5%). There was no complication related to transapical cannulation.

Conclusions: Transapical aortic cannulation is an excellent procedure to establishing extracorporeal circulation quickly, provides sufficient antegrade aortic flow. However, this procedure cannot correct the existing malperfusion, complementary femoral cannulation should be considered in some cases.

P5-3

A NEW GUIDELINE-BASED DETECTION FOR ACUTE AORTIC DISSECTION AT EMERGENCY ROOM

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Background : Acute aortic dissection is a rare and a life-threatening disease, mandating immediate evaluation and treatment. In 2010, American college of cardiology/American heart association suggested a new risk score system for detection of acute aortic dissection. In this present study, the authors evaluated the effect of the guideline in the detection for acute aortic dissection.

Methods : We examined 155 patients with acute aortic dissection regardless of types from January 2000 to June 2012. We compared the known risk factors and 12 newly proposed risk, based on the new guideline, after dividing them into delayed diagnosis (DD) group and early diagnosis(ED) group. We assessed the impact of an aortic dissection detection risk score on diagnostic process.

Results : Abrupt onset of pain was the most frequent symptom (65.2%) and only had an impact on early diagnosis (P=0.021). 83 patients (53.5%) demonstrated a widened mediastinum in the chest X-rays. The diagnosis was delayed in 21 patients (13.8%). Acute coronary syndrome was the most common delayed diagnosis (42.8%). By the new guideline, 6 patients (3.8%) were grouped under the low risk, 88 patients (56.8%) under the intermediate risk, and 61 patients (39.3%) under the high risk. 3 patients showed a mediastinal widening among 6 patients with low risk.

Conclusion : Acute aortic dissection presents various manifestations, which may lead to a delayed diagnosis. Thus, in addition to applying the new guideline, having high suspicion in diagnosis enables the early diagnosis to be more accurate.

P5-4

CLINICAL OUTCOME OF SURGICAL TREATMENT OF ACUTE TYPE A INTRAMURAL HEMATOMA

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OBJECTIVE

The optimal treatment of acute type A aortic intramural hematoma (IMH) remains elusive. According to several investigators, medical treatment is recommended for patients with uncomplicated type A IMH. However, medically treated acute type A IMH had a highly unpredictable course with no reliable anatomical predictors, and adverse clinical events were not uncommon. In our institution, the general principals of the treatment of acute type A IMH is same as those for classic aortic dissection (AD). In the present study, clinical outcome of surgically treated acute IMH was evaluated by comparing outcome of patients with classical AD.

METHODS

A retrospective study was carried out in 175 patients who were surgically treated for type A acute aortic syndrome between April 2007 and August 2012. Of these patients, there were 53 patients with type A IMH and 122 patients with type A classic AD. Mean age was 69 years (range 42-89), with 18 female patients. Findings of computed tomographic scan and in-hospital mortality were analyzed retrospectively.

RESULTS

Maximum diameter of the aorta in patients ranged from 35 to 67 mm, and in 29 patients, aortic diameter exceeded 50 mm. Maximum hematoma thickness ranged from 5 to 37 mm, and in 23 patients, it was more than 11 mm. During surgery, an intimal tear was identified in 21 patients. Only one patient died of rupture of descending aorta after operation (1.9%). Operative mortality rate of the patients with type A classic AD was 2.5%.

CONCLUSION

We conclude that emergent surgical treatment of aortic type A IMH resulted in low mortality, and emergent surgery should be the treatment of choice for all patients with acute type A IMH.

P5-5

ACUTE TYPE A AORTIC DISSECTION-WESTERN EUROPE VS JAPAN-

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OBJECTIVES

The purpose of this study was to evaluate differences between a Western European and Japanese patient cohort with acute type A aortic dissection.

METHODS

In 487 patients (297 male patients, mean age 61.9 ± 12.2 y) who underwent surgery for acute type A aortic dissection, baseline preoperative and intraoperative data were collected. Western European patients (n=237) were compared to Japanese patients (n=250). Clinical data included patient demographics, history, status at presentation, imaging study results and intraoperative findings.

RESULTS

The Japanese cohort had significantly more women (48.8% vs. 28.7%, p<0.0001), lower BMI (24.2 vs. 26.4, p<0.0001) and lower prevalence of hypertension (49.2% vs. 65.8%, p=0.0002). More DeBakey type I dissections and less type III dissections with retrograde extension were reported in Europe than in Japan (77.2% vs. 48.4%, p<0.0001, 3.4% vs. 38.7%, p<0.0001, respectively). More entries were found in the ascending aorta (78.5% vs. 58.5%, p<0.0001) and aortic arch (24.9% vs. 13.7%, p=0.0018) in European patients than in Japanese patients, who had more entries in the descending aorta or undetected entries.

CONCLUSIONS

In acute type A aortic dissection, Western European patients reveal striking differences from Japanese patients regarding gender distribution, entry tear location and type of dissection. Japanese women are more likely to develop acute type A aortic dissection than Western European women.

P5-6

FAMILIAL AORTIC DISECTIONS

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Objective:Inherited connective tissue disease are associated with aortic aneurysms and dissections. In this report, we present two brother patients who operated for chronic type I aortic dissections.

Methods:A 37 year- old male was admitted to our clinic with complaints of chest pain, dyspnea. In transthoracic echocardiography type I aortic dissection, ascending aort aneurysm (90 mm) and severe aortic valve insufficiency were identified. When we investigated patient's family history we found that two family members (father and sister) were lost due to aortic dissection.The patient also had eye, bone and craniofacial abnormalities. The patient's brother who was accompanying him also had cranio-facial and bone deformities (pectus carinatum).We decided to investigate him too. Both patients did not have signs of Marfan's syndrome. In transthoracic echocardiography, chronic type I aortic dissection, ascending aortic aneurysm (70 mm) and severe aortic valve insufficiency were identified. On thoracic computed tomography ascending aortic aneurysm and type I aortic dissection were identified. Both patients were operated with an interval of one week. Chronic type I aortic dissection was seen on both patients. Bentall procedure was performed on both patients.

Results:Both patients were discharged without any complication on post operative seventh day. We investigated also the children of the two patients. The older brother's daughter who is 21 years old has got the same bone deformities with her father. Her brother who is 18 years old has got pectus carinatum same as his father. His ascending aorta was measured 3.8 cm in diameter on transthoracic echocardiography which is close to limits of surgical indications. The younger brother's children also have the same bone deformities.

Conclusions:What is interesting about our patients is almost all the members of the family have the similar disease, and skeletal deformities. The patients are currently being investigated genetically by Dr. Bart Loeys.

P5-7

RISK FACTORS OF RUPTURE FOR TYPE A ACUTE AORTIC DISSECTION : CAN WE PREDICT RUPTURE FROM PREOPERATIVE COMPUTED TOMOGRAPIC FINDINGS?

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[OBJECTIVE]

The influence of preoperative anatomical features in type A acute aortic dissection(AAD) on rupture is less well known. So we evaluated risk factors of rupture of type A dissection retrospectively from preoperative computed tomographic(CT) findings.

[METHODS]

133 patients of type A AAD underwent emergent operations in our groups from January 2009 to November 2012.

Risk factors for rupture of type A acute aortic dissection were examined including gender, age, length of dissection , classification of DeBakey , and preoperative CT findings ; blood flow in false lumen, diameter of ascending aorta , ratio of ascending and arch aortic diameter , thickness of false lumen , percentage of false lumen area.

[RESULTS]

Mean age was 65.7±12.4 years(range 33 to 90) , 75(56%) were male. Rupture defined as free blood in a pericardial space was present in 70 patients (52.3%).

Classification of DeBakey($p<0.001$), diameter of ascending aorta($p<0.001$), ratio of ascending and arch aortic diameter ($p=0.009$) , age($p=0.016$) were significant risk factors in an univariate analysis for rupture.

Multivariate analysis for rupture revealed only classification of DeBakey 2($p=0.012$).

Because no significant differences are seen in the other CT findings like thrombose, we guess it is hard to predict rupture preoperatively except for cardiac tamponade. So we recommend urgent operation if any dissection is type A.

[CONCLUSIONS]

Classification of DeBakey 2 was only independent risk factor for rupture of type A AAD. When patients are older or the diameter of ascending aorta and ratio of ascending and arch aortic diameter are bigger, the more AAD tended to rupture.

P5-8

LATE REOPERATIONS AFTER SURGERY FOR ACUTE TYPE A AORTIC DISSECTION

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Objectives: To evaluate the incidence and risk factors after repair of type A acute aortic dissection.

Methods: From 2000 to December 2012,101 patients underwent emergency surgery for acute type A aortic dissection. 6 patients(aged 37-86 years)who had late complications related to previous aortic surgery for acute type A dissection underwent redo surgery for aortic type A dissection underwent redo surgery.

Results: The average time interval from the initial repair to the redo procedure was mean 5.7 years, ranging from 3 to 8 years. Initial surgery included ascending aorta and aortic arch replacement. The previous operative methods were ascending aorta replacement in 4 cases, aortic arch replacement in 2 cases. The resons for reoperation after type A dissection were dilatation of the aortic root and progress of aortic regurgitation in 2 cases, pseudoaneurysm formation at the anastomosis in 2 cases, aortic arch aneurysm in 1 case, re-dissection 1 case. The methods of reoperation after type A dissection were aortic root replacement in 4 cases, aortic arch replacement in 1 case, re-ascending aorta replacement in 1 case. The mean duration of operation was 12.6 hours and the mean cardiopulmonary bypass was 332 minutes, the mean intraoperative bleeding was 7928ml. There were 2 hospital deaths, one patient who performed emergency operation died from multiple organ failure and the other patient(86 years old) from mediastinitis. Remaining 4 patients recoverd well and left a hospital.

Conclusion: Even if it was a re-operation, early ambulation was possible in young patient, and prognosis was bad in an elderly patient and the emergent case.

P6-1

TOTAL ARCH REPLACEMENT VERSUS ASCENDING AORTA REPLACEMENT FOR ACUTE TYPE A AORTIC DISSECTION WITH ENTRY ONLY IN ASCENDING AORTA

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Objective: Patients treated with an extensive approach including total arch replacement for acute type A aortic dissection (AAAD) may improve long-term outcome. But it is still controversial whether to perform extended aortic replacement or to ascending replacement under life-threatening condition. We investigated whether total arch replacement could be justified for patients with AAAD with entry only in ascending aorta with acceptable surgical results.

Methods: From April 2009 and November 2012, 62 patients underwent emergent operation for AAAD with entry only in ascending aorta. These patients were divided in 2 group, Total arch replacement (25 patients) and Ascending aorta replacement (37 patients) and were compared surgical outcomes of these groups. Preoperative characteristics of two groups (Total arch group vs. Ascending group) were as follows: mean age (66±13 vs. 67±14 years),cardiogenic shock (4 vs. 11 cases) , cardiac tamponade(6 vs. 12 cases), cerebral ischemia (3 vs. 6 cases), previous cardiac surgery (2 vs. 0 cases). Concomitant procedures included CABG (1 vs.2cases), Aortic root replacement (1 vs.4 cases), Femoral-Femoral bypass (0 vs.3 cases).

Results: There was no difference in 30-day mortality (Total arch group vs. Ascending group 8.0% vs. 8.1%), hospital stay (33±27, 26±18days), postoperative stroke (0 vs. 4 cases), operation time (309±88 vs. 277±74minutes), and cardiopulmonary bypass time (153±37 vs. 134±40minutes) . Circulatory arrest time (41±10 with selective antegrade cerebral perfusion vs. 29±7 with retrograde cerebral perfusion; P<0.001) were significantly shorter in Ascending replacement. Mean lowest bladder temperature (26.7±1.5 vs. 24.5±2.8°C; P=0.0003) was significantly higher in Total arch.

Conclusions: Aggressive approach such as total aortic arch replacement for patients with AAAD with entry only in ascending aorta can be performed with an acceptable operative risk comparable to replacement of the ascending aorta.

P6-2

THE OUTCOME OF HEMIARCH REPLACEMENT FOR TYPE A ACUTE AORTIC DISSECTION IN ELDERLY PATIENTS

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OBJECTIVE

Type A acute aortic dissection is a critical disease that should be immediately treated surgically.There are some arguments against operation for acute type A aortic dissection in elderly patients. So we must dispute legality of operation for acute type A aortic dissection in elderly patients.

METHODS

Between January 1 2004 to June 30 2012,77 patients were treated with hemiarch replacement.We divided into those 70 years of age or more but less than 80 years of age (group A,40patients, 74.2±2.7years old) and those 80 years or older (group B,37patients, 84.3±4.0years old)to compare the results of surgical treatment. The results are calculated using t test or square test($p<0.05$) and described mean±standard deviation.

RESULTS

The preoperative characteristics were similar in the two groups.The surgical items (Operation time,Circulation time,Aorta clamp time,Circulation arrest time) were also no significant difference in the two groups. There was no significant difference between group A and group B in perioperative death (5% vs 10.8%,P=0.34),in hospital death(10% vs 8.1% P=0.76),and late death(2.5% vs 2.7% P=0.94). The surviving rate in the late period was 85.0% in group A and 81.1% in group B.The 3 year survival rate was 80.9% in group A and 80.3% in group B(P=0.6).

CONCLUSIONS

In our study,we have a positive result. Elderly people have a high risk for perioperative complications.It is important to select a simple operative strategy.

P6-3

SURGICAL TREATMENT FOR TYPE A ACUTE AORTIC DISSECTON IN OCTOGENARIANS

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[OBJECTIVE] Management of octogenarian patients with acute type A aortic dissection is controversial. Our study aimed to evaluate the outcomes of surgery for acute type A aortic dissection in patients over the age of 80 years.

[METHODS] Between April 2007 and March 2012, twenty octogenarians of 99 consecutive patients underwent emergent surgery for acute type A aortic dissection in our institute. The median age was 82 years (80 to 91 years); the patients were 5 men and 15 women. On admission 2 patients (10%) had preoperative shock, 2 (10%) had a neurological deficit, and 2 (10%) had malperfusion of the lower half of the body. All surgeries were performed surgery under moderate hypothermia with selective antegrade cerebral perfusion; the procedures were 17 ascending aortic replacements and 4 total arch replacements.

[RESULTS] In-hospital mortality was 5% (1 of 20 patients), without statistical significance compared with 7.6% in patients younger than 80 years. This patient presented mesenteric malperfusion after the surgery. 3 years survival was 87.1%, without statistical significance compared with 7.6% and 87.5% in the other patients.

[Conclusion] Surgical treatment for type A acute aortic dissection in octogenarians shows satisfactory early and midterm results.

P6-4

CONVENTIONAL ELEPHANT TRUNK PROCEDURE AND TOTAL AORTIC ARCH REPAIR FOR ACUTE TYPE A DISSECTION

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Objective:

The purpose of this study is to evaluate surgical results and patency of false lumen after total aortic arch repair with elephant trunk procedure for acute type A aortic dissection.

Methods:

Between 2004 and 2012, 46 patients underwent total arch repair with elephant trunk procedure for acute type A dissection in our institution. Thirty-eight patients had postoperative enhanced computed tomography evaluation and these patients were enrolled in this study. Cerebral protection was achieved by selective cerebral perfusion and hypothermic circulatory arrest in all cases. Patent false lumen was evaluated by computed tomography before discharge and classified into four subsets such as, I: no patent false lumen, II: patent only at abdominal aorta, III: patent at abdominal and part of thoracic aorta, IV: patent at abdominal and thoracic aorta, and V:patent only at thoracic aorta.

Results:

The mean patients age was 63 ± 10 year-old. Seven (18.4%) patient had a shock status preoperatively. Malperfusion of the distal organs occurred in seven patients (18.4%). Total arch replacement and elephant trunk procedure was performed for all cases. Mean length and diameter of elephant trunk was 10.1 ± 1.6 and 22.7 ± 2.5 cm. Concomitant procedure was aortic root replacement in 6 and coronary artery bypass in 4.

One patient died during hospitalization. Perioperative morbidity included 3 (7.9%) with stroke and 1 (2.6%) in paraplegia. Postoperative computed tomography showed the findings of distal aorta was as follows; I:11(28.9%), II:13(34.2%), III:10(26.3%), IV:3(7.9%), V:1(2.6%). The number of arteries which were originated from false lumen was the celiac artery 3 (7.9%), the superior mesenteric artery 2 (5.3%), the right renal artery 3 (7.9%), and the left renal artery 14 (36.8%).

Conclusions:

Elephant trunk procedure was safe and effective for acute aortic type A dissection.

P6-5

THE SURGICAL STRATEGY WITH "ADVENTITIAL OVERLAY METHOD" FOR THE ANEURYSM/DISSECTION OF THORACIC AORTA

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Among higher aging society, we are currently facing some difficulties to evaluate risks and also to choose criteria of surgery with more beneficial treatment.

According to our surgical series, Kansai Medical University, Osaka, Japan, related on the aneurysm of thoracic aorta, there was high ratio of patients over-75s in 27 (29%), which included urgent cases in 14, compared to overall 92 patients from May 2009 to October 2012.

There are itemized our cases in two groups as part of replacement as below. The elective cases in 49: ascending-root 5, ascending 4, hemi arch 6, total arch 27, descending 5, thoraco-abd 7, other 1. The urgent cases in 28: ascending-root 2, ascending 18, hemi arch 2, total arch 9, descending 1, thoraco-abd 1 and the repair of ruptured ascending 1. Elephant trunk repair for total arch replacement was performed in 23 of all. As a concomitant surgery was required, CABG 15, AVR 5, MVP 1 and PV isolation 2. We lost one patient in the urgent group due to ischemic enteritis, however the others were alive until now.

Regarding to our surgical cases with 'the autologous adventitial overlay/inversion technique', it seems more beneficial points to precede less bleeding procedure.

There are several knacks for these inversion techniques not only for using soft and feasible tissue but also for making less oozing from suture lines and needle holes even if presumed beating over high blood pressure.

It is considerable to be valuable for treating aged patients with poor organ function by using these techniques as above. We would like to share the outcome of our series with some bibliographical considerations.

P6-6

SURGICAL REPAIR AS EMERGENCY FOR TYPE A AORTIC DISSECTION: OUR 5 YEARS EXPERIENCE

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Objective: The optimal surgical repairs for patient with type A Aortic dissection as emergency is controversial. We retrospectively reviewed our 5 years experience of surgical repair as emergent operation for type A dissection.

Methods: Between January 2008 and October 2012,124 consecutive patients with type A Aortic dissection underwent surgical procedure as below. Basically, for almost cases (N=108:86%), we performed hemi-arch repair with deep hypothermic circulatory arrest and retrograde cerebral perfusion on LV apex perfusion for CPB. Other 16 cases were performed total arch replacement with selective cerebral perfusion.

Results: The mean age of patients was 64.4+/- 14.9 years (28-93yo), 62% were male. As preoperative condition, patients had shock state (N=42:33%), cardiac tamponade (N=32:25%), impending rupture or ruptured (N=14:11%), and organic mal-perfusion included stroke (N=24:19%). We found intimal tear on ascending Aorta in 60 (48%) cases, on arch in 24 (19%). Complete resection rate of intimal tear was 56%. Cardiopulmonary bypass (CPB) time, cross-clamp time and systemic circulatory arrest time were 251.9+/-64.5min, 170.5+/-46.6min and 61.6+/-17.5 min prospectively. 5-year actual survival rate was 86,4%. In-hospital mortality was 7.7% (N=12). The cause of hospital death in 30 days of operation was MOF (N=2), intestinal mal-perfusion (N=2), severe infection (N=2), low cardiac output (N=2), uncontrollable bleeding (N=2), cerebral infarction (N=1), and rupture of residual aneurysm (N=1). CPB time is significant factor for mortality as hospital death (AL:248.9+/-5.9min, D:295.5+/-18.2, p=0.01). Morbidity related with operation were severe cerebral infarction (N=13:10%), respiratory distress (N=25:20%). temporally renal failure (N=14:11%), and PMI (N=5:4%). Although late death was 6 cases, no patients were dead cause by cardiac and aortic rerated disease in follow-up period.

Conclusions: Our strategy for emergent surgical repair might be acceptable to patients with acute type A dissection. However, more attention should be paid to time of CPB.

P6-7

PERIOPERATIVE FACTORS ASSOCIATED WITH 30 DAY ALL-CAUSE MORTALITY IN ACUTE AORTIC DISSECTION TYPE A

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(OBJECTIVE) Operative mortality of acute aortic dissection (AAD) type A is still high in spite of progress of operative devises and procedure. We performed an analysis of single center retrospective study of perioperative factors associated with 30 day all-cause mortality in patients with acute aortic dissection type A.

(METHODS) We performed 108 emergency operations for AAD type A between January 2006 and December 2009. We statistically compared perioperative factors between patients with 30 day survivors (Group S) and patients who did not survive 30 day after operation (Group D). Preoperative factors were age, sex, fibrin degradation products (FDP), D-dimer, antithrombin 3, blood glucose, creatine kinase, creatine kinase MB, body mass index (BMI), and existence of shock / cardiopulmonary arrest / aortic rupture. Intraoperative factors are operative time, cardiac arrest time, cardiopulmonary bypass time, circulatory arrest time, operative procedure (ascending aortic replacement or total arch replacement), and total amount of bleeding/ blood ransfusion. Statistical analysis was conducted by student T test and chi square test. We performed multivariate analysis to the significant factors in univariate analysis.

(RESULTS) 30 day mortality was 28.7% including 8 patients who had been already cardiopulmonary arrest before operation. In univariate analysis, there were significant difference in preoperative CK-MB (Group S: Group D) ; (25±27 IU/l : 19.5±11.7 IU/l) ($p<0.001$), operative time(421.3±124.9min : 527±196.2min) ($p<0.001$), cardiac arrest time (130.1±35.5min : 161.6±92.7min) ($p=0.02$), cardiopulmonary pump time (229.1±59.9min : 310.1±157.1min) ($p=0.001$), circulatory arrest time (49.6±13.9min : 62.1±48.4min) ($p=0.01$), total amount of bleeding (3410.1±2029.5ml : 6939.8±8416ml) ($p=0.04$), the amount of intraoperative transfusion of RCC (1253±869.4ml : 1428±820.4ml) ($p<0.001$). Multivariate analysis demonstrated that each above mentioned factor was significant.

(CONCLUSIONS) Perioperative factors associated with 30 day mortality was preoperative CK-MB, operative time, cardiac arrest time, cardiopulmonary bypass time, circulatory arrest time, total amount of bleeding, the amount of intraoperative blood transfusion.

P6-8

FAVORABLE LONG-TERM OUTCOME OF OUR SURGICAL REPAIR FOR STANFORD TYPE A ACUTE AORTIC DISSECTION WITH PRIMARY TEAR-ORIENTED STRATEGY

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OBJECTIVE

We present our early and long term outcome of surgical repair for acute type A aortic dissection to clarify the value of conservative approach.

METHODS

From 1985 to 2007, consecutive 131 patients with acute Stanford type A aortic dissection underwent surgical repair by a single operator (M. S.) in our hospital. There were 79 men and 52 women with a mean age of 60.5±13.3 (27 to 83) years-old, and 13 patients had Marfan syndrome. Aortic repair was primarily oriented to exclusion of entry tear. Bentall, ascending aortic or hemiarch replacement, and partial or total arch replacement were performed in 8, 110, and 13 patients, respectively.

RESULTS

One operative death caused by intractable bleeding in Bentall procedure.30-day mortality and in-hospital mortality were 8.4% and 11.5%, respectively. Malperfusion (p=0.002) was a significant risk factor for in-hospital mortality. Only one deaths among 12 type II patients was due to transfusion-related graft versus host disease in very early period. Long term outcome were followed in 105 patients from 116 survivors with a mean follow up period of 137 ± 71 months (8 to 329). At 5, 10, 15 years, overall survival were 97.3%, 82.8%, and 47.9%, aortic death-free rate were 97.2%, 90.1%, and 81.6%, and, thoracic aortic reoperation-free rate were 89.9%, 80.4%, and 60.0%, respectively. 40 thoracic aortic reoperation were performed in 34 patients (29.3%) with 30-day mortality of 7.7% and in-hospital mortality of 12.8% with no stroke or paraplegia. Cox regression analysis revealed limited procedure was risk for arch reoperation (p=0.032), but it does not influence aortic death or overall survival. Marfan syndrome (p=0.01) and proximal location of primary tear (p=0.024) were risk for reoperation distal to descending aorta.

CONCLUSIONS

Our strategy composed of primary tear-oriented conservative acute repair and suitable secondary reoperations can support these high risk patients group.

P7-1

CEREBRAL BLOOD FLOW AFTER HYBRID DISTAL HEMI-ARCH REPAIR USING A T-SHAPED SYNTHETIC GRAFT

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PURPOSE: Aortic arch disease can be treated with hybrid repair (extra-anatomic bypass plus placement of aortic endoprostheses), but there is controversy about whether a bypass from one relatively small vessel will provide adequate blood flow to the entire brachiocephalic system. We therefore compared flow volumes before and after hybrid repair.

METHODS: We reviewed the records of 16 patients who underwent a hybrid distal hemi-arch repair between 2010 and 2012. The procedure consisted of debranching of the left subclavian and left common carotid arteries, creation of a bypass to these vessels from the right subclavian artery by using a T-shaped synthetic graft, and placement of a stent graft. Measurements of blood flow volume in common carotid arteries, internal carotid arteries, and vertebral arteries were done postoperatively in 13 patients and preoperatively in 11 of those 13 by using Doppler sonography. Measurements of regional cerebral blood flow were done postoperatively in 13 patients and preoperatively in 12 by means of single-photon emission computed tomography (SPECT).

RESULTS: Perioperative complications were one fatal acute aortic dissection and two minor strokes. No major endoleaks occurred. Postoperatively, mean flow volumes in the right and left common carotid arteries, the right and left internal carotid arteries, and the right and left vertebral arteries were 423 and 393, 271 and 189, and 87 and 80 mL/minute, respectively. Regional cerebral blood flow in the territories of the anterior, middle, and posterior cerebral arteries was not significantly different from preoperative levels, as assessed both with and without administration of acetazolamide.

CONCLUSIONS: Hybrid distal hemi-arch repair preserved regional cerebral blood flow and vasoreactivity, although flow in the common carotid artery and the internal carotid artery were right-side dominant postoperatively.

P7-2

THE TREATMENT OF AORTIC ARCH ANEURYSMS IN THE SAME SESSION WITH HYBRID METHODS

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Background: Management of thoracic aorta aneurysms -especially the ones including aortic arch- is highly complicated. Isolated or non-isolated aortic arch aneurysms can be repaired by hybrid procedure especially in patients with comorbidities as well as by conventional open methods.

Methods: Eleven patients who underwent total arch debranching and endovascular stent implantation on antegrade route in the same session between November 2006 and October 2009 were retrospectively evaluated using clinical and perioperative criteria.

Results: The mean age was 65±6.2 and 9 of the patients were male. Primary technical success rate was 100%. Mortality, stroke or transient paraplegia/paraparesia was not seen during in-hospital follow-up. Average follow-up period was 36±13 months and no late-term aortic pathology was seen. In only one of patients, endovascular re-intervention was required for type 1B endoleak. No mortality or neurological pathology was seen in long term postoperative follow-up.

Conclusion: Hybrid procedures could be performed safely with lower complication and higher success rates in the same session via antegrade route and zone 0 graft deployment for high-risk cases with isolated or non-isolated aortic arch aneurysms.

P7-3

LONG TERM RESULTS OF CONVENTIONAL AORTIC ARCH REPLACEMENT

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Objective: Although the surgical results of conventional aortic arch replacement has been improved with the development of surgical technique, the long term results remains unclear. Meanwhile, the development of TEVER emerges the discussion about the feasibility and applicability of TEVER to aortic arch. The aim of this study is to elucidate the long term durability of conventional aortic arch replacement.

Methods: Between April 1990 and November 2012, 203 patients underwent total aortic arch replacement with branched graft using antegrade selective cerebral perfusion (SCP). In all, 43 patients (21%) were operated on for acute dissection, 24 (12%) for chronic aortic dissection, 136 (67%) for degenerative aneurysm. Concomitant operations were performed in 65 (32%) patients.

Results: The operative mortality (within 30 days) was 12/203 (5.9%), and in-hospital mortality was 16/203 (7.9%). Four (2%) out of 203 patients had a perioperative stroke. Fifty two patients (25.6%) were died in the long term period and aneurysm-related death was occurred in 7 patients: abdominal aneurysm (AAA) rupture in 6, descending thoracic aneurysm (TAA) rupture in 1. Fifty nine procedures were performed in 51 patients during the follow-up period included aortic root replacement in 3 patients, total arch re-replacement in 3, TAA in 26, thoracoabdominal aneurysm in 6, AAA in 21. Overall survival rate in 5 and 10 years were 75.6±0.04%, 51.1±0.05% respectively. Freedom from aneurysm-related death in 5 and 10 years were 96.7±0.01%, 90.9±0.03% respectively. Risk factors have an impact on late death due to aortic events (95% confidence interval, p) were chronic renal failure; RR (risk ratio): 2.57 (1.24-5.34, 0.01), increasing age (over 75 years old) ; RR: 5.51 (1.33-22.8, 0.02).

Conclusion: Conventional total arch replacement with branched graft using SCP is reliable and durable operation. Further evaluation is mandatory as to whether TEVER is feasible alternative to the conventional arch operation.

P7-4

AORTIC ARCH REPLACEMENT USING ANTEGRADE CEREBRAL PERFUSION: THE EFFECTS ON END-ORGAN FUNCTION

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Objectives:
Antegrade cerebral perfusion has been increasingly used in aortic arch surgery, however, little is known about the clinical effects of this technique on end-organ function.

Methods:
Between 2001 and 2011, 89 patients (aged 61.8±12.7 years, 50 females) underwent elective arch replacement using antegrade cerebral perfusion. End-organ dysfunction was defined as one of followings: neurologic injury (permanent or temporary), renal dysfunction (decline in GFR > 50% of baseline) and hepatic injury (elevation of both AST and ALT > twice the reference values). Logistic regression analysis was performed to determine the factors predictive of the end-organ dysfunction.

Results:
The surgery involved Hemiarch (n=65) or total arch (n=25) replacement. Mean antegrade cerebral perfusion time was 38.2±29.1 min. There were 5 in-hospital deaths (5.6%) and 10 neurologic injuries (11.2%). Thirty-one patients (34.8%) experienced renal dysfunction, and of them 11 (12.4%) required hemodialysis. Hepatic injury was observed in 17 patients (19.1%). On logistic regression analysis, body ischemic time (HR 1.36, 95% CI 1.02-1.82, P=0.037) and cardiopulmonary bypass time (HR 1.08, 95% CI 1.01-1.45, P=0.035) were independent predictors of end-organ dysfunction. Body temperature during circulatory arrest, however, did not affect organ dysfunction (P=0.96), but lower temperature (< 21°C) resulted in delayed mental recovery (P=0.006) and prolonged ventilator support (P=0.057).

Conclusions:
Antegrade cerebral perfusion for aortic arch surgery offered acceptable cerebral and visceral organ protection. However, significant proportion of patients exhibited clinical findings of visceral organ injury. Study results suggest the use of moderate hypothermia rather than deep hypothermia with the efforts to minimize circulatory arrest and cardiopulmonary bypass times.

P7-5

TOTAL ARCH REPLACEMENT FOR KOMMERELL'S DIVERTICULUM

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OBJECTIVE

Kommerell's diverticulum is a rare congenital aortic arch anomaly. Various surgical techniques have been reported, however, surgical strategy is still controversial. In our institute, total arch replacement (TAR) has been selected for treatment of Kommerell's diverticulum because it enables to release vascular ring completely for resolving symptoms including dysphagia and dyspnea and to decrease the risk of future dissection or rupture. This study evaluated the effectiveness and safety of this technique.

METHODS

Between 2000 and 2012, 4 patients (100% male, age: 38-72 years old) underwent TAR for Kommerell's diverticulum. All patients had right aortic arch with aberrant left subclavian artery (ALSCA). Indications for surgery were dysphagia and dilatation of Kommerell's diverticulum. A median sternotomy and a right thoracotomy at 3, 4 or 5 intercostal space were made on left oblique position. Cardiopulmonary bypass was established by femoral artery and/or ascending aorta cannulation and bicaval drainage with pulmonary artery vent. Under deep hypothermia, circulatory arrest with retrograde cerebral perfusion was induced. Currently, aortic arch was reconstructed using arch first technique. Kommerell's diverticulum was approached via right thoracotomy. Descending aorta was transsected at the level of azygos vein, and anastomosed to distal end of the graft. ALSCA was anastomosed to the graft and the graft was anastomosed to ascending aorta.

RESULTS

There was no hospital death, or major complications, but a 72-year old patient required prolonged hospitalization because of respiratory failure. All patients discharged from hospital and are doing well.

CONCLUSIONS

TAR is a reasonable surgical technique for Kommerell's diverticulum because it enables complete anatomical repair without major complications and decreases the risk of future dissection or rupture.

P7-6

RECENT OUTCOME OF TOTAL ARCH REPLACEMENT IN MORE THAN SEVENTY-FIVE YEAR-OLD PATIENT

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BACK GROUND

Since 2008, debranched TEVAR has been opted for arch aneurysm repair in over 75 year-old patient. Some patients, however, had conventional total arch replacement because of anatomical incompatibility.

METHODS

Between January 2008 and April 2012, 103 patients more than 75 year-old (mean age 79.0±3.2, range 75 to 87, male 70) underwent conventional total arch replacement. There were 22 emergent operations (acute aortic dissection type A in 18 patients, rupture of arch aneurysm in 4). Perioperative risk factor were stroke in 35 patients, coronary artery disease in 37, chronic obstructive pulmonary disease in 13 and chronic kidney disease in 14.

RESULTS

Mean follow-up time was 18±12 months. Mean cardiopulmonary bypass (CPB) time was 246±62 minutes, mean cardiac arrest time was 149±47 minutes, mean circulatory arrest time was 62±14 minutes. Mean lowest nasopharyngeal temperature was 23.6±2.0 degrees.

Hospital mortality rate was 6.7% in all cases and was 6.1% in elective cases. Concomitant procedures were CABG in 20 patients, aortic valve replacement in 7, Bentall operation in 1. Postoperative complications were major stroke in 3 patients (2.9%), minor stroke in 8 (7.7%), respiratory disorder in 17 (16.5%). No patients had spinal cord complications. The 1- and 3-year survival rate were 89.1% and 79.5%, respectively. Univariate analysis demonstrated that the risk factor for early mortality were ruptured aneurysm (P=0.004), long time CPB (P=0.031), much transfusion(P=0.001) and perioperative urine volume less than 1000cc (P=0.001).

CONCLUSION

The surgical outcome of the conventional arch replacement was acceptable, even in the patients of advanced age. The conventional open replacement could be one of the realistic options for treatment of arch aneurysm of advanced age in the TEVAR era.

P7-7

EXAMINATION OF THE TREATMENT RESULTS OF PARTIAL ARCH REPLACEMENT IN OUR HOSPITAL

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Objective: We did partial arch replacement (only brachiocephalic artery, or brachiocephalic artery and left common carotid artery) for ascending aortic aneurysm and aortic arch aneurysm, and analyze our performances.

Methods: Between February 2004 and September 2012, 48 patients underwent partial arch replacement (63±13.6 years old, 29 men and 19 women). Types of disease were 37 true aneurysm (from base to arch: 6, ascending aorta: 1 , only aortic arch: 1 , from ascending aorta to aortic arch: 29), 9 aortic dissection (Type I: 4, Type II: 5, brachiocephalic: 1), and 2 false aneurysm (from ascending aorta to arch and left common carotid artery). 42 cases were elective operation, 7 cases were emergency. Postoperative complications were 1 cardiac tamponade (2%), 5 coronary artery disease (11%), 2 COPD (4%), 1 hemoptysis (2%), 2 chronic renal failure on HD (4%), 3 cerebral infarction (6%). All operations were performed by antegrade brain separation extracorporeal circulation method, and 19 cases ware replaced only brachiocephalic artery, 29 cases were brachiocephalic and left common carotid artery. Simultaneous operations were 8 mBentall, 1 Reimplantation (David), 8 AVR, 1 AV repair, 4 CABG. We had 12 cases of bicuspid AV cases.

Result: Operation time was 375±97 minutes, intubation period was 1.2±0.7 days, and 0 inhospital death. Postoperative complications were 2 advanced AV block, 1 acute renal failure, and 2 mediastinitis. There was no cerebral infarction. Duration of hospitalization was 26±13 days, 1 case transfered to a different hospital for rehabilitation and others were discharge. 1 year survival rate was 97%, and 5 year survival rate was 82%.

Conclusions: Partial arch replacement was safe and useful procedure. The benefits were to replace proximal arch completely, to avoid injury of left recurrent laryngeal nerve, and to avoid resternotomy for distal arch aneurysm by performing hybrid operation in the future.

P7-8

AN ADULT SURGICAL CASE FOR INTERRUPTED AORTIC ARCH WITH A HUGE SACCULAR THORACIC ANEURYSM ACCOMPANIED BY RENAL INSUFFICIENCY

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Objective:
Interrupted aortic arch (IAA) in adulthood is very rare congenital disorder.
Besides, surgical interventions have been rarely reported.
Therefore, we present an adult surgical case diagnosed IAA with a huge saccular thoracic aneurysm accompanied by multiple abdominal aneurysms and renal insufficiency.
Methods:
A 49-year-old man who had done rehabilitation for sequela of cerebral hemorrhage was indicated hypertension in upper extremities and hypotension in lower limbs. Computed tomography confirmed IAA (Type A) with a huge saccular thoracic aneurysm (50 mm in diameter) and multiple abdominal aneurysms. Multiple antihypertensive drugs were prescribed to prevent from cerebral hemorrhage and thoracic aneurysm rapture.
Then, he was referred to our hospital for a detailed investigation. Although his blood pressure in upper extremities had been controlled around 120 mm Hg at admission, renal insufficiency (serum creatinine = 3.8 mg/dl) was developed due to hypotension in abdominal organ.
Selective angiography for a huge thoracic aneurysm revealed an inflow vessel from suprascapular artery and an outflow vessel to descending aorta.
Surgical intervention was recommended for thoracic aneurysm and abnormality of blood pressure.
Results:
Surgery was performed via the left fourth intercostal posterolateral thoracotomy. Thoracic aneurysm was realized to adhere firmly to descending aorta. It was incised after clamping aneurysm partially on the side of descending aorta. Then, inflow and outflow vessels were sutured from aneurysm inside. A bypass from left subclavian artery to descending aorta was performed using 18 mm straight J Graft SHIELD NEO (Japan Lifeline Co. Ltd. Tokyo, Japan) without cardiopulmonary bypass.
Postoperative course was uneventful. Pressure gradient between upper and lower extremities and serum creatinine were respectively improved.
Conclusion:
This is very rare adult surgical case of IAA as simultaneous thoracic aneurysm resection and postoperative normalization of renal function.
Careful monitoring is required for remaining multiple abdominal aneurysms.

P7-9

AORTIC ARCH ANEURYSM: SHORT, MEDIUM AND LONG TERM RESULTS COMPARING OPEN ARCH SURGERY AND HYBRID PROCEDURE

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OBJECTIVE:
Open arch surgery carries high risk of post-operative mobi-mortality although it is the technique of reference in aortic arch aneurism treatment. In this context, hybrid arch procedures have emerged but only few data are available about their long terms results compared to open surgery.

METHODS:
From January 2000 to January 2012, 27 open arch surgeries including 1 emergency and 17 hybrid arch procedures including 3 emergencies were performed at our institution. All these cases concern arch aneurysm involving at least one carotid artery (Zone 0 & 1). Distal arch and descending thoracic aneurysms were excluded (Zone 2 and beyond).

RESULTS:
There wasn't any significant difference in pre-operative comorbidities between the two groups. The incidence of in hospital mortality was similar at 18.5% (5/27) for open surgery and 17.6% (3/17) for hybrid procedure (p=1) and the incidence of permanent cerebral neurologic deficit was equivalent at 16% (4/25) for open surgery and 26.7% (4/15) for hybrid procedure (p=0.444). For medium and long term results, median survival was 115 months for open surgery and 67.7 months for hybrid procedure. At one, three, five and seven years of follow-up, survival rates [73% vs. 69%; 68% vs. 60%; 68% vs. 60% and 62% vs. 32% (p=0.325)] and incidence of MACCE [42% vs. 33%; 42% vs. 33%; 42% vs. 33% and 42% vs. 64% (p=0.813)] between open surgery and hybrid procedure respectively weren't statistically different. But incidence of reintervention [0% vs. 11%; 0% vs. 19%; 0% vs. 27% and 5% vs. 27% (p=0.028)] was in favor of open surgery.

CONCLUSION:
Although technically seducing, the results of hybrid arch procedure do not demonstrate any benefit on morbi-mortality and increase the risk of reintervention. Only contraindicated or high risk patients should benefit from this technique and open surgery must still be considered as the technique of choice.

P8-1

LATE PRESENTATION OF NEAR TOTAL ATRESIA OF THE DESCENDING AORTA AT THE ISTHMUS AND ITS SUCCESSFUL TREATMENT WITH A BYPASS GRAFT: A CASE REPORT

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Congenital aortic atresia is a common malformation accounting for 71-86 %of all left ventricular outflow tract (LVOT)obstructive lesions in children. Left ventricular outflow obstruction (LVOTO) due to atresia is most commonly present at the aortic valve but rarely has atresia been identified in the descending aorta.

We report a case of a 25-year old girl, who was evaluated for headaches and uncontrolled hypertension. CT scan chest showed a short atretic segment in the descending aorta at the level of the isthmus. She underwent surgery; a jump graft was placed between the arch of the aorta and the descending aorta using partial occlusion clamps.

P8-2

AORTIC ROOT REPLACEMENT FOR AN 11-CM ASCENDING AORTIC ANEURYSM IN A PATIENT WITH MARFANOID FEATURES: A CASE REPORT

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Marfan syndrome (MFS) is an inherited connective tissue disorder with an autosomal dominant transmission pattern. Patients categorized as marfanoid, those failing to meet the major criteria of MFS, possess features such as increased arm-span, arachnodactyly, joint hyperlaxity, lens subluxation and scoliosis.

The case we present is of a 30-year old tall man with marfanoid features who presented with shortness of breath. On evaluation with echocardiography, he was found to have severe aortic regurgitation with a large 11-cm ascending aortic aneurysm. CT angiography showed the ascending aortic aneurysm extension up to the innominate artery with dissection in the proximal portion of the ascending aorta.

Medical management is targeted towards strict blood pressure control. Endovascular stent grafts (EVSG) are being employed with increasing frequency in the repair of distal aortic aneurysms in patients with MFS. With the advent of surgical intervention, the prognosis of patients with MFS has markedly improved.

P8-3

ROOT RECONSTRUCTION WITH TOTAL ASCENDING AORTIC REPLACEMENT USING HYPOTHERMIC CIRCULATORY ARREST AND SELECTIVE CEREBRAL PERFUSION FOR MODERATELY DILATED DISTAL ASCENDING AORTA

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[Objective]
There are some cases whose distal ascending aorta has been moderately dilated, when we performed reconstruction of aortic root. Usually, distal anastomosis of ascending aorta was performed under aortic clamping. In such situation, dilated distal ascending aorta would be remaining. We describe extended root and ascending aortic reconstruction using our current strategy.
[Patients and methods]
Between March 2011 and May 2012, 12 (9 men; mean age, of 69.0 ± 7.6 years) patients underwent root reconstruction with total replacement of the ascending aorta under hypothermic circulatory arrest with antegrade selective cerebral perfusion for complete resection of dilated ascending aorta just below innominate artery. All patients were diagnosed annulo aortic ectasia with aortic regurgitation preoperatively by computed tomography, angiography and ultrasound cardiogragraphy. Maximum aortic root diameter was 52.5 ± 4.4 mm. Distal ascending aorta just below innominate artery was moderately dilated as 41.7 ± 1.4 mm in diameter. Root procedures were performed as; modified Bentall procedure in 8, David procedure in 4.
[Results]
Operative outcomes excluding in diameter of distal ascending aorta (41.7 ± 1.4 mm vs. 35.0 ± 3.2 mm) were not significant difference compared with who had been performed root reconstruction under distal ascending aortic clamping during same period. Postoperative computed tomography revealed the complete resection of dilated ascending aorta. Neurological dysfunction and postoperative stroke did not arise in this series. All patients remained in hospital after surgery for 26.2 ± 5.9 days.
[Conclusion]
Hypothermic circulatory arrest and selective cerebral perfusion were established safe and common procedure in aortic arch surgery. Postoperative computed tomography revealed the complete resection of dilated ascending aorta. We considered that complete resection of dilated ascending aorta under hypothermic circulatory arrest and selective cerebral perfusion might be preventing re-operation for dilatation of distal ascending aorta including arch aorta at long-term period.

P8-4

HEMOSTATIC MODIFICATION OF PROXIMAL ANASTOMOSIS IN THE BENTALL PROCEDURE

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OBJECTIVE

Since the bleeding from proximal suture line could represent one of the most devastating complications in the Bentall procedure, several preventive techniques have been suggested to avoid it. We present our technical modifications for reinforcement of proximal anastomosis adopted in two cases of acute type A aortic dissection with aortic root aneurysm.

METHODS

First case was a 63-year-old woman with Marfan syndrome who had considerably enlarged aortic sinuses (65mm in diameter), with the intimal tear located in one of the sinuses. Second case was a 69-year-old male with enlarged aortic sinuses (60mm) accompanied with extensive dissection of the sinuses extending around the coronary ostia.

In our modification of the Bentall procedure, proximal aorta was dissected down to the basal ring and Teflon felt strip was placed around the aortic annulus. 2-0 interrupted polyester mattress sutures were passed from outside of the aortic root through the annulus to the sewing cuff of the composite graft, in relatively flat plane fashion.

Then the proximal suture line is reinforced with a running 4-0 monofilament suture incorporation aortic wall remnants and the sewing cuff. Following completion of coronary ostia reimplantation, open distal anastomosis was undertaken during a hypothermic circulatory arrest.

RESULTS

No excessive bleeding from the proximal anasitomosis site was recognized after declamping of the aorta and no postoperative re-exploration was required. Post operative course in both case were uneventful.

CONCLUSIONS

The acute type A aortic dissection with aortic root aneurysm can be successfully treated by the Bentall operation using this modifid procedure. Although larger number of cases and long-term results are required for confirmation, we consider this modification of proximal 2 rows of suture lines provide a secure and reproducible anastomosis in Bentall procedure, even in the case of aortic dissection.

P8-5

MODIFIED CABROL SHUNT AFTER COMPLEX REDO- AORTIC ROOT SURGERY

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Objective

Bleeding after redo-aortic root replacement may be impossible to control in a certain situation.Perigraft to right atrial shunt for hemorrhage control after aortic surgery was first described by Cabrol and colleagues. We report another modification of Cabrol shunt.

Method

45 years old male patient with Behcet disease had history of aortic valve replacment with mechanical valve at 8 years ago and then he had replacced aortic root with aortic homograft due to severe aortic regurgitation and aortic prosthetic valve annular dehiscence at 7 years ago. He presented severe aortic regurgitation and severe homograft calcification due to aortic homograft failure(Fig 1). Patient was replaced with aortic root using button Bentall technique with St. Jude composite graft(St. Jude Medical, MN, USA). On-going bleeding from many operative sites occurred, including bleeding from aortic annular and both coronary button anastomosis sites. Bleeding continued despite of conventional maneuvers, including application of sutures, topical hemostatic agents, and recombinant factor VII. .

As a result, a bovine pericardial patch(approximately 8 x 10cm) was tailored to isolate the area of bleeding from aortic root . Suturing the patch proceeded from the superior vena cava laterally on the patient's right side along the right atrium inferiorly, and the border of the heart and pulmonary artery on the patient's left side. After aortic root exclusion with bovine pericardial aptch, bovine patch was bulging due to bleeding and hypotension was noticed, so we decided to connect the cavity covered by bovine pericaridial patch to superior vena caval cannualtion sites using Goretex tube graft 6mm(Fig. 2). Bleeding was controlled, as blood from aortic root was redirected to superior vena cava creating autotransfusion of shed bloods as described originally by Cabrol and coleagues.

Conclusion

Modified Cabrol shunt allows an option for dealing with severe bleeding in redo complex aortic root surgery.

P8-6

EFFICACY OF MOTOR EVOKED POTENTIAL MONITORING IN THORACIC AND THORACOABDOMINAL AORTIC REPAIR

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This study aims to evaluate the efficacy of motor evoked potential (MEP) monitoring during thoracic endovascular aortic repair (TEVAR) compared with open surgery.

Method

From 2005 to 2012, there were 53 cases of thoracic and thoracoabdominal aortic surgery performed both preoperative multi-slice computed tomography to visualize the Adamkiewicz artery (AKA) and intraoperative MEP monitoring. Open surgery and TEVAR were performed in 23 cases (Group O) and 30 cases (Group T). Neurologic MEP was measured in group O and myogenic MEP was measured in group T.

Results

Preoperative CT depicted AKA in all cases. One case in group O died postoperatively due to thromboembolism with paraplegia. In group T, paraplegia occurred in 1 case and 2 cases suffered from paraparesis, which appeared at 2 and 7 days after the operation and both of them recovered. Paraparesis may be related to hypotension.

In group O, MEP decreased in 6 of 13 cases in which AKA was occluded and 2 cases showed spinal cord damage. MEP did not change in 10 cases in which AKA was not occluded and all these cases did not show neurological deficit. In group T, MEP decreased in 5 of 9 cases in which AKA was occluded and 1 case showed paraplegia and 2 cases showed transient and delayed paraparesis. MEP decreased in 8 of 21cases in which AKA was not occluded and all these cases did not show any neurological deficit. Incidence of MEP decrease without AKA occlusion decreased in the latter half of Group T, which may be related to blood pressure control.

Conclusion

MEP monitoring is effective to detect spinal cord injury in both of open surgery and TEVAR. In TEVAR, MEP change may result from hypotension during and MEP change needed careful observation. Blood pressure should be controlled restrictively.

P8-7

THORACOABDOMINAL AORTA REPLACEMENT WITH INTERVENTIONAL BALLOON OCCLUSION OF STENTED ELEPHANT TRUNK FOR PATIENTS FOLLOWING SUN'S PROCEDURE

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Objective: To summarize our preliminary experience of thoracoabdominal aorta replacement with interventional balloon occlusion of stented elephant trunk for patients following Sun's procedure.

Methods: Thoracoabdominal aorta replacement was performed in 2 patients following Sun's procedure in Beijing Anzhen Hospital. The operations were conducted without CPB and the proximal anastomosis was performed after stented elephant trunk was occluded by an interventional balloon.

Results: 2 patients were discharged without any complication.

Conclusions: Interventional balloon occlusion of stented elephant trunk enlarge the indication of thoracoabdominal aorta replacement without CPB for patients following Sun's procedure and makes the operation more easy and convenient.

P8-8

OCTREOTIDE TREATMENT OF INTRACTABLE CHYLOTHORAX AFTER DESCENDING AORTA REPLACEMENT

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[OBJECTIVE] Chylothorax after vascular procedures is uncommon. The management of chylothorax can be difficult because this complication is not well established. In order to avoid surgical approach to the thoracic duct, somatostatin and the long-acting somatostatin analogue octreotide (Sandostatin, Novartis, Switzerland) have been recently suggested as the alternative modalities for the treatment of chylothorax. The objective of this study is to regard octreotide treatment as the alternative choice.

[METHODS]cases reports.

[RESULTS]We report two cases of chylothorax successfully treated with octreotide 300μg/day subcutaneously injected. «Case 1» A-58-year-old male was referred to our hospital for dyspnea. Computed tomography (CT) showed chronic dissected aneurysm of the descending aorta (the maximum diameter 80mm) and giant bulla of both lungs. Descending aorta replacement as well as the left upper lobe partial lobectomy was performed. After surgery, pleural chyle effusion was drainaged tremendously. Although conventional conservative treatment was not effective, drainage of chyle significantly decreased after subcutaneous injection of octreotide for a week. «Case 2» A-74-year old female was referred to our hospital for back pain. CT revealed acute aortic dissection Type B. Although conservative treatment began, the diameter of the aneurysm increased from 45mm to 55mm during two months. We operated her to replace the dissected aneurismal descending aorta with a prosthetic vessel. Following surgery, her pleural effusion was chylothorax. Because conservative management was intractable, furthermore her poor condition, octreotide 300μg/day subcutaneously administered to her for a week. Her pleural effusion was gradually diminished.

[CONCLUSIONS]However the mechanism of octreotide has not been elucidated, octreotide treatment was effective and noninvasive for postoperative chylothorax.

P8-9

EFFECTIVENESS OF TEMPORARY PERICARDIAL HOOD FOR DIFFICULT HEMOSTASIS IN AORTIC SURGERY

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Background : Hemostasis remains a serious problem in aortic surgery. This study aimed to investigate the clinical efficiency of temorary pericardial hood in the management of bleeding problem.

Methods : Thirty patients were identified who underwent packing of surgical gauzes around the prosthetic graft (group G, n=13, period 2007-2010) or pericardial hood formation (group H, n=17, 2011-July 2012) as the temporary means for hemostasis after replacement of the ascending aorta +/- the aortic root +/- the arch. The pericardial hood was made by suturing bovine pericardial patch along SVC, RA appendage, RV outflow tract, main pulmonary artery, and thymic tissue. Early outcomes were compared with those of the patients who recovered without bleeding problem (group N, n=15, 2010-July 2012).

Results : Procedural time parameters (duration of CPB and entire surgery) were longer in group G and H than in group N. The time consumed for hemostasis (interval from CPB off through skin closure) was shorter by 16 min in group H (mean 102.4 min) compared with group G (mean 118.5 min). Hastened reoperation due to anastomotic bleeding before scheduled second look was required in 2 of group G and 1 of group H patients. The two patients of group G died of sequelae to cardiac arrest that occurred while preparing for the reoperation. All other patients underwent successful delayed closure within 36 hours after the initial procedure. The average amount of postoperative red cell transfusion was significantly different among groups (G 7.5, H 4.3, N 1.7 units). There was no incidence of wound infection in any group.

Conclusion : Temporary pericardial hood was effective in managing difficult hemostais after aortic surgery by avoiding undue prolongation of surgery and maintaining hemodynamic status without massive transfusion. It is considered safer and more effective than simply packing surgical gauzes around the prosthetic graft.

P8-10

ANGIOPOIETIN-LIKE PROTEIN2 (ANGPTL2) CONTRIBUTES TO THE DEVELOPMENT OF AORTIC ANEURYSMS THROUGH INCREASING THE CHRONIC INFLAMMATION IN AORTIC WALLS

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Abdominal aortic aneurysm (AAA) is characterized by atherosclerotic changes with chronic inflammation of aortic walls. However, the molecular mechanism underlying chronic inflammation in the development of AAA has not been elucidated well. We recently reported that adipocyte-derived Angiopoietin-like protein2 (Angptl2) is a key mediator linking obesity to adipose tissue inflammation and systemic insulin resistance. And we also reported that Angptl2 is an important inflammatory mediator of other chronic diseases, such as rheumatoid arthritis, and breast cancer and dermatomyositis. Since Angptl2 is expressed in macrophages as well as adipocytes, we investigated whether Angptl2 is involved in AAA formation. Firstly we found that Angptl2 was expressed in macrophages in medial layer of aortic aneurysmal lesion, but not in non-dilating lesion. RT-PCR analysis revealed that the proinflammatory markers and matrix metalloproteinase 9 (MMP-9) mRNA expression in aortic aneurysmal lesions was significantly increased compared with that seen in non-dilating aorta surrounding lesions. And Angptl2 mRNA expression in aortic aneurysmal lesions was also significantly increased compared with that seen in non-dilating lesions. Thus, Angptl2 may be a mediator causing vascular chronic inflammation in the pathogenesis of aortic aneurysm.

P9-1

USEFULNESS OF FENESTRATED STENT GRAFT FOR TYPE B AORTIC DISSECTIONS

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[Objective]
The introduction of thoracic endovascular aortic repair (TEVAR) technology has ushered in a new era in the therapy for disease of the distal aortic arch and the descending thoracic aorta.
Thoracic endovascular aortic repair (TEVAR) for Type B aortic dissections has come into wide use, despite it is still controversial.
In addition, many dissections have entries in distal arch. Therefore, in order to cover distal arch entries, stent grafts needs to be placed in aortic arch.
[Methods]
From 2006, we introduced the TEVAR of the aortic arch with fenestrations strategically placed for each arch branch without the use of extra anatomical bypass.
In this year, we performed 2cases fenestrated stent grafting for complicated Type B sub acute dissection. The proximal ends of devices were placed at Zone 0 in all cases.
[Result]
The technical success rate was 100%. Average operation time is 169.5 ± 64.4 minute.
Operative blood loss of each cases were within 50ml.
There were no operative death and no cerebrospinal events. there are no migrations and device-related complications requiring additional endovascular or open procedures.
[Conclusion]
Endovascular repair of the Type B dissection with a fenestrated SG can be easily performed, and it seems less invasive than other procedures.
However, mid and long term results of this procedure are unknown.
Therefore, we believe that the accurate follow up is needed in order to ensure the patient's long term safety.

P9-2

STAGAED HYBRID ENDOVASCULAR STENT-GRAFTING COMBINED WITH AORTIC ARCH REPLACEMENT FOR EXTENSIVE AORTIC ARCH AND DESCENDING AORTIC PATHOLOGIES

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(OBJECTIVE)

Conventional aortic replacement for extensive arch and desncending aortic aneurysm is technically challenging. Hybrid arch procedures with open arch replacement followed by stent grafting (TEVAR) have emerged as a choice of the treatment. This study evaluated clinical outcomes of single institutional cases with staged hybrid procedures for the extensive aortic pathologies.

(METHODS)

From February 2008 to March 2012, 2-staged hybrid procedures were performed in 16 patients (72±5 years) with extensive aortic arch and descending aortic pathologies. In the 1st-stage open surgery, the ascending aorta and proximal arch were replaced using 4-branch aortic graft and short elephant trunk (5cm) was inserted into the distal aortic arch in order to secure the landing zone for 2nd- stage TEVAR. After full recovery of the patients (median: 33 days), TEVAR was performed. Spinal drainage was used for spinal protection in 8 cases.

(RESULTS)

In the 1st arch replacement, in-hospital mortality was 0% and stroke rate was 6.2% (1 case). Stent-grafts were successfully deployed in all cases. The levels of the distal end of stent-grafts were Th7-8 in 7 cases, Th9-10 in 2 cases, Th11-12 in 4 cases, and L1-2 in 3 cases. There was type 1a minor endoleak in 1 case. In the 2nd -stage TEVAR, there was neither in-hospital mortality nor stroke. Reversible spinal cord ischemia occurred in 1 patient. During the follow-up, there was no death and no aortic event.

(CONCLUSIONS)

Staged hybrid procedure for extensive arch and descending aortic pathologies was a safe alternative to conventional open surgery and advantageous for neurological complications.

P9-3

THE EFFICIENCY OF ENDOVASCULAR TREATMENT OF AORTIC TYPE B DISSECTION

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[Background and Objectives] In the uncomplicated case of aortic type B dissection, the maximum diameters at the time of the onset exceed 4cm and the false lumen patency case causes the expansion of the aorta diameter over time, and suggested that great vessels connection death and complications become higher. Therefore, we performed entry closing (TEVAR-EC) using the stent graft. We divided the time of early phase (EC-E) and chronic phase (EC-C) .We revealed the validity of this treatment strategy. [Methods] Analyzed the change of those volume and the maximum diameter of aorta after the TEVAR-EC by t-test in EC-E group and EC-C group, and compared with medical treatment group. In the EC-E group, 18 cases in total, EC-C group were 8 cases other than 2 cases and emergency of the explosion emergency. The medical treatment group was 7 cases. [Results] We accepted the expansion of the true lumen in 13 of 16 cases (81.2%) and 5 of 7 cases (71.4%) in the EC-C group, and 8 of 9 cases (88.8%) in the EC-E group.Whichever of aorta diameter and the true lumen diameter and the false lumen diameter recognized expansion in all cases in the medical treatment group. The volume increase in the true lumen and the volume reduction of the false lumen was recognized in 13 of 16 cases (93.8%)in TEVAR-EC group. In addition, we accepted the increase of the true lumen and the reduction of the false lumen in 6 of 7 cases (85.7%) in the EC-C group and in all cases (100%) in the EC-E group. We recognized the increase of the volume in all cases in the medical treatment group. [Conclusions]Entry closing TEVAR results in the expansion of the true lumen, and in the reduction of the false lumen, and the possibility being useful treatment was suggested.

P9-4

ENDOVASCULAR REPAIR OF DISTAL AORTIC DISSECTIONS

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All cases of TEVAR for type 3 AD at our institution between 2009 and 2012 were retrospectively reviewed.

In total, TEVAR was performed in 57 cases.

We compared the false lumen open type (31cases) with the close type (26cases).

Baseline and demographic characteristics were evenly distributed.

The indication of TEVAR was aneurysm, malperfusion, rupture, ULP, re-dissection.

In open group, aneurysm were 15cases, malperfusion 11cases, rupture 2cases, ULP 1 case, re-dissection 2cases, another, in close group, aneurysm were 3 cases, malperfusion 2 cases, rupture 4cases, ULP 17cases, re-dissection no cases.

We sorted false lumen into three groups: all thrombosis, only stent part thrombosis, non thrombosis after TEVAR.

In open group, all thrombosis was 9 cases, only stent part 5 cases, non 16 cases. In close group, all was 25cases, stent no cases, non 1cases.

Post operative aortic diameter enlargement was 12/31 cases in open group. Close group was 9/26 cases.

Hospital death was 1 case in close type.

P9-5

HYBRID REPAIR OF ABERRANT LEFT SUBCLAVIAN ARTERY WITH KOMMERELL'S DIVERTICULUM

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Objective:Aneurysms involving a right-sided aortic arch and descending thoracic aorta with aberrant left subclavian artery (Kommerell diverticulum) are rare. We present the successful hybrid repair of this vascular anomaly by the combined use of total arch replacement followed by TEVAR to exclude the aortic aneurysm.

Case: 65-year old male patient. His chest CT showed 65mm aneurysmal Kommerell diverticulum from descending aorta in a right aortic arch. He had a pat medical history of hypertension and hyperlipidemia, and undertook PCI for angina pectoris. We planned to repair this aneurysm with hybrid procedure. First, aortic arch replacement and total debranching were performed with cardiopulmonary bypass via median sternotomy. Moderate hypothermic circulatory arrest with antegrade selective cerebral perfusion was applied for the open distal anastomosis of the proximal aortic arch with elephant trunk using 4-branched 22/10/8/8mm Gelweave graft. 51 days after this operation because of protracted wound healing, TEVAR was performed via right common femoral artery to exclude the aneurysm following coil embolization against the root of the aberrant left subclavian artery. He had no other postoperative complications and was discharged home on postoperative day 8. The patient had no complications at 60 months after completion of this procedure.

Conclusion: Various surgical techniques for Kommerell's diverticulum were documented, but a specific strategy has not been established. This approach may help reduce complications and mortality in cases of Kommerell diverticulum.

P9-6

OPERATIVE STRATEGY FOR ARCH ANEURYSMS: EFFECTIVENESS OF TEVAR WITH ASCENDING AORTA LANDING

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Objectives: Total arch repair (TAR) is the gold standard therapy for arch aneurysm; however, there is room for improvements. We present the outcome of our endovascular strategy for arch aneurysms.Methods: During the last 6 years, 404 patients were treated by thoracic endovascular aneurysm repair (TEVAR) for thoracic aortic aneurysm (TAA) except of rupture and dissection cases. reconstruction of cerebral branches was necessary in 93 patients with arch aneurysms all of whom were considered to be high risk for TAR. Untill 2009, we performed common carotid artery (CCA) - CCA bypass (25 cases), carotid branch debranching from ascending aorta (11 cases), and TAR with elephant trunk (6 cases) to build a proper proximal neck. Since 2009, we have performed chimney technique (39 cases), and the Retrograde In-situ Branched Stent grafting (RIBS, 7 cases). The chimney technique involves a uni or bi-lateral common carotid artery exposure and insertion of a small diameter covered stent to preserve cerebral flow in conjunction with the deployment of the main endograft in the ascending aorta. The RIBS procedure is performed by puncturing the main endograft in a retrograde manner and followed by balloon dilatation and covered stent deployment. Results: Debranching TEVAR leads higher mortality (6.3%), and higher stroke rate (12.7%) than chimney technique and RIBS. Mortality in chimney technique was 2.5%, and stroke rate was 5.1%. In RIBS, the mortality and stroke rate was 0%. Endoleak was encountered in 3 (7.9%) cases and all were among the chimney patients as a result of gutter EL. There were no cases with endoleak among the RIBS patients.Conclusions: Both the Chimney technique and the RIBS procedure are safe and effective for the patients with arch aneurysm those were needed ascending aorta landing. RIBS appear to be advantageous in further eliminating gutter endoleak.

P9-7

HYBRID TEVAR OF ASCENDING AORTIC ANEURYSM

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Thoracic endovascular aortic repair (TEVAR) has recently been recognized as an alternative to open surgery for treatment of thoracic aortic aneurysm. Combined with supra-aortic bypass or chimney-grafts, this minimally invasive technique has also been used in the treatment of aortic arch aneurysm. We describe four cases of a successful repair of an ascending aortic aneurysm contained dissecting aneurysm, infective aneurysm, and pseudoaneurysm. There were a case of impending rupture, and two cases of rupture. Two cases restored perfusion of supra-aortic vessels from the left subclavian artery, one case restored from the right femoral artery, and the double chimney-graft technique was performed in one case. In all cases, all supra-aortic vessels had to be covered with aortic stent-graft to receive a sufficient landing and sealing zone. The patient with infective aneurysm died due to septic shock on day 171, the others survived. We detected two minor endoleaks. The use of hybrid TEVAR is possible in high-risk patients where the proximal landing zone of endograft would be in zone 0.

P9-8

COST EFFECTIVENESS OF HYBRID ENDOVASCULAR AORTIC ARCH REPAIR WITH DE-BRANCHING VERSUS CONVENTIONAL AORTIC ARCH REPLACEMENT

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Objective

Aortic arch debranching with endovascular graft placement, the hybrid arch procedure, has emerged as a surgical option in aortic arch aneurysm.

The aim of the study was to assess if compared with operative repair, the hybrid arch procedure was associated with a cost benefit in management of disease affecting the aortic arch.

Methods

From July 2011 to June 2012, 11 consecutive patients were treated with the hybrid procedure. During the period, after exclusion of emergent and concomitant cardiac operation cases, 22 patients underwent elective conventional total aortic arch replacement. Clinical characteristics, outcomes and hospitalization costs of these patients were reviewed retrospectively.

Results

Preoperative characteristics were similar between two groups. Hospital mortality was one patient in open surgical group. There was no statistical difference in stroke, paraparesis, sepsis, or renal failure postoperatively. Operation time and in hospital stay were shorter in TEVAR group than open surgical group (238±43min versus 415±97 min, $p<0.01$, 14.5±4.9 days versus 26.9±12.9days, $p<0.01$). The total hospitalization costs remained greater for Open repair versus TEVAR (5,168,680±1,374,320 yen versus 3,922,659±974,584 yen, $p=0.01$). Operation costs were similar in both groups (3,506,430±899,602 yen for TEVAR group, 3,940,966±755,309 yen for open repair group, $p=0.12$). Among TEVAR group, the total hospitalization costs for patients implanted 2 stent grafts (n=6) has no significant difference compaired to Open repair group (4,677,492±803,808 yen, $p=0.43$).

Conclusion

Overall hospital costs are greater for open repair comparing with hybrid TEVAR. Assessment of in-hospital costs reveals hybrid TEVAR to be a cost-effective treatment alternative in the short term. Further investigation of hybrid TEVAR long-term costs is imperative because TEVAR patients require lifelong monitoring similar to patients having endovascular repair of abdominal aneurysms (EVAR).

P9-9

EARLY RESULTS OF DEBRANCHING TEVAR FOR DISTAL ARCH AORTIC ANEURYSMS

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OBJECTIVE : Total arch replacement has been the first line treatment for arch aortic aneurysm. However, debranching thoracic endovascular aortic repair (TEVAR) was selected recently for the patients with considerable risk for the conventional surgery. We report our early results of debranching TEVAR for the selected patients with the arch aortic aneurysms.

METHODS : We retrospectively investigated the patients who underwent debranching TEVAR for atherosclerotic arch aortic aneurysms in our hospital from January in 2009 to December in 2012. The patients who had aortic dissections were excluded. We used commercially-available stent grafts in japan, such as GORE TAG, TALENT, and Zenith TX2. For the proximal landing to zone 0, total debranching TEVAR with mediansternotomy or two-debranching TEVAR with chimney graft were used. For the proximal landing to zone 1, other two-debranching TEVAR were used. For the proximal landing to zone 2, one-debranching TEVAR were used. EuroSCORE and Japan SCORE were used to evaluate the surgical risk. The major complication rates including cerebral infarction were examined. The early survival rate was calculated by Kaplan-Meier method.

RESULTS : Twelve patients underwent debranching TEVAR: 4 patients underwent total debranching TEVAR, 4 patients underwent two-debranching TEVAR with chimney graft, 3 patients underwent two-debranching TEVAR without chimney graft, 1 patient underwent one-debranching TEVAR. EuroSCORE was 22.5 ± 15.9 points and Japan SCORE 30day mortality rate was 12.8 ± 15.3 %. Two patients (17 %) had cerebral infarctions. Type1a endoleak without aneurysm dilatation was pointed out for two patients. Type2 endoleak was detected for other two patients, who were treated later by coil embolization at the left subclavian artery. The survival rate at the three years after the operation was 87.5%.

CONCLUSIONS : Debranching TEVAR for arch aortic aneurysm is feasible for the selected patients in our series. Further investigation with long follow-up are required.

P9-10

TREATMENT STRATEGY OF ZONE 0 LANDING CASES WITH HYBRID THORACIC ENDOVASCULAR ARCH REPAIR

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Objective: Aortic arch aneurysms are extremely burdensome for the surgical treatment due to complicated anatomies. The hybrid endovascular arch repair is still challenging, especially for zone 0 landing (ascending aortic landing) cases. The aim of this study was to elucidate the early and mid-term results hybrid arch TEVAR for zone 0 landing cases.

Methods: From 2008 to 2012, we performed hybrid arch TEVAR for zone 0 landing cases in 46 out of 180 hybrid arch TEVAR. Among them, this study, we reviewed 26 cases of degenerative arch aneurysms (mean age; 74 years, men; 85%, logistic EuroSCORE; 17.6%). The maximum diameter of aneurysms and ascending aorta were 62.8mm and 37.3mm. Regarding procedures, simple total cervical debranching from ascending aorta in 9 cases, ascending aortic banding with debranching in 9, and graft replacement with cervical bypasses in 8. We used TAG in 23, and Valiant in 3.

Results: Procedural success rate was 96.2% (25/26, one type I endoleak). Mean operation time was 319 minutes. The rate of ventilation period within 72 hours was 92.3% (24/26). We had no operative death, no stroke, nor spinal cord injury. We had in-hospital death in only one case (3.8%), and 21 patients (80.8%) discharged home. The aorta-related survival rate was 100% at 4 years. For the next step, I would like to show you the video of TEVAR using the new double side-branch device for arch aneurysms.

Conclusions: We achieved satisfactory early and mid-term results of hybrid arch TEVAR for zone 0 landing cases. Hybrid arch TEVAR with zone 0 landing was one of alternative procedure for degenerative arch aneurysms.

P10-1

THORACIC ENDOVASCULAR AORTIC REPAIR IN THE MANAGEMENT OF DISTAL ARCH ANEURYSMS

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OBJECTIVE: Conventional repair of aortic arch pathology is associated with significant mortality in high-risk patients. Because endografting has produced excellent results for descending thoracic aortic disease, extension of thoracic endovascular aortic repair (TEVAR) to the arch is being considered.

METHODS: We studied 14 patients [11 men/3 women; mean age, 77.5 ± 5.8 (67-87) years] with distal arch aneurysms treated with TEVAR into the aortic arch (zone 0-2) between May 2010 and October 2012. Branch vessels were covered without revascularization, surgically bypassed (debranching), or stented (stenting or stent grafting [Chimney]). Success was defined as accurate endograft deployment with aneurysm exclusion and target vessel revascularization. Postoperative outcomes and complications were analyzed.

RESULTS: Stent grafts were deployed into zone 2 of the arch in 8 cases, zone 1 in 4 cases, and zone 0 in 2 cases. In zone 2 TEVAR, the left subclavian artery (LSA) was covered without revascularization in 5 cases and bypassed in 1. In zone 1, 2 debranchings (1 each for the left common carotid artery (LCCA) and the LSA) were performed in 3 cases, and 1 debranching for LSA and 1 stenting for LCCA in 1 case. In zone 0, total debranching was performed in 1 case and double-chimney technique in 1 case. There were 2 hospital deaths (14.2%) due to hypertensive encephalopathy from the zone 2 group and multiple thromboembolisms in 1 patient from the zone 1 group. One patient needed hemodialysis postoperatively and 1 needed redo bypass for LCCA due to graft infection. After TEVAR, Type Ia endoleak was noted in 1 case with subsequent aneurysm shrinkage. No cerebral infarction was noted.

CONCLUSION: TEVAR for distal arch aneurysms was associated with high mortality in our study. Although TEVAR can effectively treat distal arch aneurysms in high-risk patients, careful patient selection is required.

P10-2

CHALLENGING THORACIC ENDOVASCULAR AORTIC REPAIR FOR HIGHLY ATHEROMATOUS AORTIC ANEURYSM

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OBJECTIVE:The aim of this study is to explore whether thoracic endovascular aortic repair (TEVAR) for aortic arch aneurysm with severe atheroma is an acceptable treatment.

METHOD:Until 2011, 26 patients (75+/-8 years) with aortic arch aneurysm treated with TEVAR were analyzed retrospectively. Shaggy aorta was detected in 10 patients by CT scan preoperatively. A stentgraft was deployed through femoral artery (n=16) or ascending aorta with debranching cerebral arteries and lateral clamping (n=9). These patients were recognized as high-risk patients for conventional procedure.

RESULT:Procedural success rate was 100%. Endoleak was occurred in 3 patients without shaggy aorta, following surgical conversion in 1 but 0% in those with shaggy aorta. Six cases with shaggy aorta encountered multiple embolic complications as follows: stroke in 2, paraplegia/paraparesis in 3, newly required dialysis in 4, and ischemic bowel syndrome in 2. Hospital death in the patients with shaggy aorta was 11% due to multiple organ failure from embolisms and 36% from the other causes. No mortality was occurred in the patients without shaggy aorta.

CONCLUSION:TEVAR for patients without shaggy aorta was feasible. Although the indication of TEVAR to high-risk group is still acceptable under only adequate informed consent.

P10-3

HEALTH-RELATED QUALITY OF LIFE EVALUATED BY THE 8-ITEM SHORT FORM AFTER ABDOMINAL AORTIC AND ILIAC ANEURYSMS: THE COMPARISON OF OPEN VS ENDOVASCULAR REPAIR

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OBJECTIVE: Open surgery (OS) for abdominal aortic and iliac artery aneurysms (AAAs) is a robust treatment with good clinical outcomes in Japan. Recently, the use of endovascular aneurysm repair (EVAR) has been widespread because of its less-invasiveness. However, patients with EVAR require postoperative frequent radiographic examinations and may be anxious about their endoleak. We prospectively evaluated Health-related Quality of Life of the patients with these 2 fashions by using the 8-item Short Form (SF-8).

METHODS: From October 2011 to October 2012, the SF-8 questionnaire was completed through interviews for 27 consecutive elective cases (OS group (O): 13, EVAR group (E): 14). Excluding criteria was as follows; perioperative status for another surgery, infectious aneurysms, and severe dementia. Two patients were lost to follow-up. The SF-8 was evaluated preoperatively and at 3 months after treatment with statistical significance ($p<0.05$).

RESULTS: In E, physical component summary score (PCS) and mental component summary score (MCS) were at 45.7±10.2, 40.52±11.4 preoperatively, and increased gradually at 49.5±4.9, 49.8±3.4 at 3 months, respectively ($p<0.01$). In O, these 2 parameters increased as well ($p<0.01$).

Although PCS and MCS of E preoperatively were worse than those of O (PCS of E vs O;45.7±10.7 vs 45.8±10.2, MCS; 40.5±11.4 vs 47.7±10.0, $p<0.05$), those of E were better than those of O at 3 months (PCS of E vs O;49.5±4.9 vs 48.1±3.0. MCS; 49.7±3.4 vs 48.5±6.7, $p<0.01$).

CONCLUSION: Although more friable patients underwent EVAR, they showed more improvement physically and mentally than patients with open surgery at short term.

P10-4

SIMULTANEOUS HYBRID PERIPHERAL REVASCULARIZATION: EARLY RESULTS

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Objectives: Endovascular and open surgical interventions may be combined in treatment of peripheral arterial disease. These interventions may be performed simultaneously if an angiography device is available within the operating room. In this study, we presented our simultaneous hybrid peripheral interventions under the light of current literature data.

Materials and Methods: Eleven patients that were operated between June 2008 and November 2010 at our hybrid operating room were investigated retrospectively. All of the patients were evaluated by radiologists and vascular surgeons preoperatively with their peripheral angiographies. Generally, endovascular intervention was performed initially, and then followed by surgery. After hybrid interventions, control angiograms were held during the same session.

Demographic data and clinical parameters of the patients and procedures performed were investigated retrospectively and recorded.

Results: None of the patients experienced either stent or graft occlusion during postoperative period. Primary patency rate was found to be 100% for the postoperative first 6 months. Ankle-brachial indices (ABI) increased significantly during postoperative period and clinical symptoms were relieved in all patients.

Conclusion: Peripheral hybrid interventions may be performed both in separate sessions and also simultaneously by experienced teams if an angiography device is available within the operating room.

P10-5

MID-TERM RESULTS OF EVAR FOR AAA USING GORE EXCLUDER DEVICE

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OBJECTIVE

We report the mid-term results of endovascular aortic repair (EVAR) for abdominal aortic aneurysm (AAA) using Gore excluder device in our department.

METHODS

From January 2007 to October 2012, EVAR for AAA using Gore excluder device (including Main body) was applied in 78 cases (male/female 70/8, age 48-92 years old, mean 74, max diameter 37-82mm, mean 49).We treated in operation rooms under general anesthesia in all cases.

RESULTS

Initial results: We succeeded to implant the stentgraft (SG) in all cases. Additional procedures in operation were stent placement (13 cases, 16.7%), scheduled coil embolization of internal iliac artery (16 cases, 20.5%) and F-F bypass (1 case, 1.3%). Complications occurred in 2 cases (cerebral infarction and limb occlusion), but there was no hospital death. Endoleaks (EL) was found in 11 cases (type I EL 2 cases [Ia 1/Ib 1], 2.6%, type II EL 9 cases, 11.5%).

Mid-term results (follow up time 1-67 months, mean 31): Dilatation of aneurysm diameter (> 5mm) in 3 cases (3.6%), reduction (< 5mm) in 38 cases (48.7%).

We needed re-intervention in 6 cases (7.7%), proximal extension for type Ia EL (1 case, 1.3%), distal extension for type Ib EL (2 cases, 2.5%), coil embolization for type II EL from inferior mesenteric artery (1 case, 1.3%), stent placement for limb occlusion (1 case, 1.3%), and open conversion to remove infected SG (1 case, 1.3%).

We experienced 3 latter death (3.8%), one due to pneumonia, 2 aneurysm-related (MOF after removal of infected SG caused coil embolization for type II EL and rupture of closure site in abdominal aorta after removal of infected SG caused aorto-enteric fistula 17 months after operation).

CONCLUSIONS

Mid-term results of our department were no different from other published results. We believe continuous careful observation, including those of peculiar complications of EVAR is necessary.

P10-6

SUCCESSFUL EVAR CASE WITH "SNORKEL" TECHNIQUE OF ADJUNCTIVE RENAL ARTERY STENTING

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Objective; AAA with the length of infrarenal proximal neck less than 10 mm was treated by not usual EVAR but conventional grafting. However, if EVAR technique is definitely able to preserve renal perfusion, it must be less invasive to high-risk patients with those AAAs. EVAR with "snorkel" technique of adjunctive renal artery stenting was successfully performed to three patients with pararenal AAA.

Case1; A 89-year-old man had pararenal AAA (φ56mm) with angina on effort and massive calcification of the aortic arch. He underwent EVAR and adjunctive renal artery stenting by "snorkel" technique for both renal artery perfusions (Bare Metal stent (BMS)). Although he suffered from a slight cerebral infraction with left hemiparesis on postoperative day 3, he was discharged with almost recovery of motor function after rehabilitation on postoperative day 21.

Case2 ; A 89-year-old woman had pararenal AAA (φ60mm) with angina pectoris and previous coronary catheter intervention. She underwent EVAR and adjunctive renal artery stenting (BMS) for both renal artery perfusions. Postoperative 3D-CT showed the patency of both renal arteries and no endoleakage of EVAR. She was discharged on postoperative day 9 without any complications.

Case3 ; A 73-year-old man had pararenal AAA (φ67mm) with past history of abdomen incision. He underwent EVAR with snorkel technique. In this case, left renal artery was observed from AAA, so we used cover stent for left side and BMS for right side. He was discharged on postoperative day 7 without complications.

Conclusion; EVAR with adjunctive renal artery stenting by "snorkel" technique was very less invasive and useful for high-risk patients with pararenal AAA. Atherosclerotic lesion of the aortic arch and the head vessels as an access route of "snorkel" technique was problematic factor. Further careful follow-up will be needed to determine the durability of this technique.

P10-7

EVALUATION OF THE CAUSE AND PREVENTION OF SEROUS RETENTION OCCURING AROUND PTFE GRAFT AFTER ABDOMINAL AORTIC REPLACEMENT

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Serous retention (SR) around vascular graft is occasionally observed a while after abdominal aortic replacement. At our institute, PTFE grafts have been used for abdominal aortic aneurysms (AAA) for some time. Among these, a case with a huge encapsulated SR required reoperation, and its serous substance mainly consisted of fibrin monomer complexes. This result inspired this study.

OBJECTIVE:
In the operative procedure for AAA, the replaced grafts are often wrapped with the remnant aneurysmal wall. We built a hypothesis in which, if the grafts were left unwrapped, SR may not occur late after surgery. So, our aim was to prove that the resection and removal of the remnant aneurysm tissue could be a preventive measure against late SR.

METHODS:
Between January 2005 and February 2012, 124 cases of AAA were replaced with ePTFE grafts. The remnant aneurysmal tissue was wrapped around the grafts until the end of the 2006. Since 2007, the remnants were resected and removed in all cases. After discharge, both series were followed-up by CT scan comparing the occurrence of late SR.

RESULTS:
SR was observed in 31.1% (14 cases out of 45 patients) in the wrapped group, while only 5 %(2 cases out of 40 patients) developed SR in the resected group. SR development was significantly lower in the resected group (p=0.0001).

CONCLUSIONS:
PTFE grafts may permeate the blood fibrinoid fraction and accompany serous retention fairly frequently. Wrapping the PTFE graft with the native aneurysmal aorta might trap the fibrin analog inside the remnant aneurysmal tissue and interfere it being absorbed into the peritoneal space. It was clear that removing the resected aneurysm contributes to the SR-free PTFE graft long after surgery.

P10-8

PRESERVATION OF INTERNAL ILIAC ARTERY, IS IT IMPORTANT IN EVAR? TAIPEI VETERANS GENERAL HOSPITAL EXPERIENCE IN ILIAC BIFURCATION DEVICE PLACEMENT

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According to previous literature, 43% abdominal aortic aneurysm (AAA)patients have unilateral common iliac (CIA) aneurysms while 11% have bilateral CIA aneurysms. And 18-25% CIA aneurysms concomitant with AAA. Traditionally, embolization of IIA and extension of the stent graft limb into the external iliac artery(EIA), were applied to manage CIA aneurysms. Internal iliac artery (IIA) bypass had also been introduced. However, pelvic ischemic symptoms and long term durability of the bypass grafts were the limitations of CIA aneurysm surgical treatment. Buttock claudication occurred in 3% of unilateral IIA embolization while 35% in bilateral IIA occlusion. In our study, the patients received CIA aneurysm exclusion with iliac bifurcation device (IBD, William A Cook Australia, Brisbane, Australia) in the past 3 years. Between Feb 2010 and December 2012, 14 patients received IBD. The average patient age was 78.56±5.29 year old. All the IBD implantations were combined with AAA endovascular repair. The mean abdominal aortic aneurysm was 52mm(45-63mm) Mean common iliac artery aneurysm was 39mm(32-63mm). The median follow-up was 8 months (range 1-23). All IBDs were with CIA length 45mm, one with the EIA length 58mm while the others were with 41mm stent graft.AAA stent graft size was 27.6±4.8mm. The mean operation time was 240 ±49.5 min. The mean ICU stay was 23.4 ±1.72 hours. The IIA was preserved with either balloon expandable stent grafts or nitinol self-expandable stent graft. The configuration and patency rate were both followed up with CT scan.The standard follow up protocol should be established, some parameter(ex: penile-brachial pressure index) should be used in addition to description of the symptoms and signs.Preservation of pelvic circulation in patients treated for bilateral or unilateral common iliac aneurysms combined with AAA is feasible and secure by endovascular repair. However, further study should be carried out and cost-effectiveness should be evaluated.

P10-9

THERAPEUTIC STRATEGY OF BLUNT TRAUMATIC THORACIC AORTIC INJURY

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OBJECTIVE : Majority of patients who sustain blunt traumatic aortic injury (BTAI) die at scene. Only 13-15% of patients arrive at hospital. Untreated BTAI mortality is 50% at 24 hours. In most cases, such patients suffered another multiple organ injuries, so systematic strategy for management of trauma and rapid decision-making is necessary.

METHODS : This is prospective review of case of BTAI between January 1, 1983 and November 30, 2012 in our institute. We excluded patient who died without surgical intervention at emergency department.

RESULTS : There were 51 cases studied over 29 years, of which 84% were caused by automobile crashes and men was 75%. Age of the patients was from 12-year-old to 86-year-old. All of the cases accompanied another organ injury. Angiography was often used as diagnostic tool before 2005, but MDCT was used recently and made it possible to diagnose rapidly and precisely. Forty-six (90%) patients underwent emergency thracotomy and repair. Three cases treated conservative, and endovascular repair is performed 2 cases. Overall mortality rate was 9.8%. Bypass technique with PCPS was used in 33 cases (65%) to prevent more bleeding in brain, pelvis and so on. Seventeen cases (33%) were underwent treatment to stop active bleeding like TAE or laparotomy prior to thoracotomy. Endovascular repair was performed elderly patient who suffered severe traumatic brain injury.

CONCLUSIONS : Diagnostically, MDCT is very beneficial. Most case of BTAI has concomitant life threatening injury; so thoracic surgeon must need skilled about trauma management and treatment priority. About the procedure for BTAI, our first choice of treatment is open repair because BTAI tend to suffer from young patient. However, long-term prognosis is unclear in Endovascular repair, it must be more effective in some case.

P10-10

MORPHOLOGIC REMODELING OF DISTAL ARCH PATHOLOGY AFTER TEVAR WITH ZENITH "PRO-FORM" TX2 THORACIC ENDOGRAFT

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Background- Structural changes and incomplete endograft apposition to the aortic arch (bird-beak configuration) after thoracic endovascular aortic repair are poorly understood. We studied and analyzed morphologic changes and factors in patients who underwent stainless stent-graft repair of thoracic aortic pathology.

Methods- From March 2011 to April 2012, 19 patients with Zone 2 or 3 thoracic aortic lesions underwent stent-graft repair using the Zenith ProForm TX2 stent-grafts. For comparison, 19 patients received Zenith Z-Trak Plus stent-grafts were also included. Chest CT scan was analyzed at 1, 6, and 12 months. Arch angles and bird-beak configuration were evaluated according to zones of attachment and by Aquarius iNtuition software (TeraRecon, San Mateo, Calif).

Results- The treated diseases included dissection (n=17), and degenerative aneurysm (n=21). Significant angle changes were noted at zone 3 (-7.4°, p=0.020) and left subclavian artery (-4.2°, p=0.042) during one year follow-up. Birdbeak was detected in 6 (31.6%) patients of ProForm and 12 (63.2%) of Z-Trak Plus (p=0.051). Mean birdbeak angle was significant smaller in patients of Proform (at one month, 5.08° vs.15.02°, p=0.019; at one year, 5.81° vs. 17.76°, p=0.033). In dissection group, preoperative zone 2 angle correlated with birdbeak formation(φ=0.789; p=0.001). Preoperative zone 2 angle sharper than 155° with higher incidence of postoperative birdbeak had been detected. The statistic is significant with an area under the ROC curve of 0.89, a sensitivity of 100%, a specificity of 78%, a positive predictive value of 80%, a negative predictive value of 100%, and a likelihood ratio of 4.5.

Conclusions- Arch remodeling after stainless stent-graft repair of thoracic aorta is a continuous process. Significant arch angle changes were noted at zone 3 and left subclavian artery. ProForm stent graft improves conformation to the arch. In patients of dissection, preoperative angle of zone 2 pathology seems to be predictive to postoperative birdbeak formation.

P11-1

A NEED FOR CANNULATION INTO THREE ARCH BRANCHES UNDER THE LACK OF INTRACRANIAL ARTERIAL COMMUNICATION: A CASE REPORT

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[BACKGROUND]
Recently, antegrade selective cerebral perfusion (ASCP) is widely used by cannulating into innominate and left common carotid arteries. However, optimal cannulation site is still controversial. We report a case that has postoperative cerebral infarction with insufficient intracranial perfusion.

[CASE]
A 63-year-old man was diagnosed with stanford type A acute aortic dissection. Computed tomography (CT) identified an entry located distal to a left subclavian artery. The operation was performed through median sternotomy under the cardiopulmonary bypass established by right axillary and right femoral artery for arterial inflow, and the right atrium using a single two-stage cannula for venous drainage. Moderate hypothermia and ASCP were used. According to our strategy, innominate, left common carotid and left subclavian arteries were perfused at a rate of 10 mL/min/kg at a rectal temperature of 25°C by two pumps separate from the systemic circulation. However, a cannula in the left subclavian artery couldn't keep proper position. Therefore, the left subclavian artery was cross-clamped and the intracurcuit pressure was adjusted to around 100 mmHg during ASCP. Regional saturation of oxygen (rSO_2) was monitored to assess cerebral perfusion. The maximum variations from base line of right-rSO_2 and left-rSO_2 were 14 and 5, respectively. The patient weaned successfully from cardiopulmonary bypass and admitted to an intensive care unit with stable hemodynamics. Postoperative day (POD) 1, there was spontaneous activity of limbs. POD 4, CT was performed for delay in awakening and confirmed acute cerebral infarction in the occipital lobe. Hypoplastic right vertebral artery and lack of efficient intracranial arterial communication were revealed by magnetic resonance imaging.

[CONCLUSIONS]
We experienced a case of postoperative cerebral infarction with insufficient intracranial perfusion. It is necessary to cannulate into all three arch branches in case we have no preoperative intracranial arterial communication imaging data.

P11-2

DEVISED TO MAINTAIN LONG-TERM EXTRACORPOREAL MEMBRANE OXYGENATOR FUNCTION DURING ECMO

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[INTRODUCTION]

Gas exchange capacity of membrane oxygenator decreases with time during ECMO. One reason is due to the condensation that occurs within the hollow fiber membrane oxygenator. We devised measures to prevent this cause.

[METHODS]

ECMO cases numbered 12 adult patients. Patients who had to have the oxygenator replaced within 24 hours were excluded. The MERA EXCELANHPO-23WC™ (Senkouikakougyou.Corp.Japan) oxygenator was used is made of a polypropylene membrane coated with silicone. As a method to prevent condensation oxygenator was covered with a plastic bag, we used the WarmTouch™5300A warming Unit of 40 ℃ to blow hot air near the gas outlet of the oxygenator. For patients who use this system, I have investigated the gas exchange capacity and the need for high-flow oxygen through condensation circulation.

[RESULTS]

The mean ECMO support time was 218 hr (78-315). Previously, the measure to prevent condensation was appropriate release (15L/min, 30 seconds) of high-flow oxygen. However, there was no case for which this measure needed to be carried out.

The value of the gas at the outlet of the oxygenator blood was stable.

(PaO_2:150-200 mmHg, F_IO_2:0.5-0.7, V/Q:0.5-0.7)

[CONCLUSIONS]

It is possible to prevent condensation by blowing oxygen mixed with carbon dioxide at high flow rates. However, care must be taken because the amount of water discharged from the oxygenator is affected by the gas flow. To prevent condensation, it has been suggested that the oxygenator ventilation should be kept of low relative humidity by eliminating the temperature difference of the oxygen gas through the supply of warm air.

P11-3

TRAINING OF TROUBLESHOOTING TECHNIQUES DURING CPB
人工心肺トラブルシューティングの院内トレーニングの確立

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[はじめに] 本邦にて人工心肺を用いた開心術が施行された当初の人工心肺操作は心臓外科医が行っていた。その後、時代とともに操作者は心臓外科医から技術者へ移り始め、現在では国家資格である臨床工学技士（CE）が行っている。当院ではこれまで人工心肺中のトラブルシューティングのトレーニングは CE4 名のみで、トレーニング用回路を使用して人工肺の交換や空気誤送時の対応等を行っていた。今回、日本心臓外科学会での人工心肺の安全対策の報告にともない、CE のみでなく、医師（心臓外科医、麻酔科医）、看護師を含めたチームでのトレーニングを行ったので報告する。[対象・方法] 通常の手術と同様のポジショニングにてトレーニング用回路を用いて体外循環を確立した後、医師よりトラブルケースの提示を受けそれぞれの対処を行った。[結果] 今回、トレーニングを行ったことで、医師、看護師、CE 個々のトラブル時の役割が明確にされていない点やコミュニケーション不足が露呈され、チーム力の重要性を再認識することができた。
[まとめ] 当院は心臓外科を開設して６年目ということもあり、このトレーニングを通じ、チーム全体のコミュニケーション不足等が問題提起されたことは非常に有用であった。今回の試みで心臓外科トラブルシューティングトレーニングの新たな形を確立できた。今後もトレーニングの継続、マニュアルの改訂をおこないチーム力の向上につなげたい。

P11-4

CPB RESULTS OF THE SURVEY IN TROUBLESHOOTING
各職種における CPB トラブルシューティングアンケート調査結果

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当院では、医療安全の目的で年に 1,2 回程度、心臓外科医、麻酔科医、看護師に対し CPB トラブルシューティングを行っている。実際の現場では執刀医と perfusion での会話に主語がなく、周りでは何が起こっているのかが分からないスタッフもいる。トラブルの怖さをハートチームとして実感してもらえればと思い、トラブルが起こる時の講義を行った後で実際に操作を体感してもらい、臨床の現場の安全確保を目的として活動している。今回、トラブルシューティングに参加したすべての職種にアンケート調査を行い、トラブルに対する職種ごとの認識の違いや、参加した後の手術に対する意気込み等を調査した。調査結果に対し考察を踏まえて報告する。

P11-5

CURRENT STATUS OF CARDIOVASCULAR PERFUSIONIST IN OUR HOSPITAL
当院における体外循環技士の現状

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[はじめに] 当院では、臨床工学技士 3 名が人工心肺業務を行っている。経験年数の浅い臨床工学技士も多く技術習得には時間と経験が必要である。そこで人工心肺業務についてどのように技術習得に取り組んできたのか、この 1 年を振り返り報告したい。[対象･方法] 現在の体制になった 2011 年 10 月から 2012 年 12 月までの 14 ヶ月間の心臓血管外科手術を対象とした。3 名のうち 2 名は人工心肺業務の経験がなかったため、人工心肺業務に必要な物品や薬剤、Priming を約 1 ヶ月、手術の流れ、体外循環記録・体外循環操作方法を約 3 ヶ月、約 5 ヶ月目からは実際に体外循環操作を行うという短期間で教育し実行した。[結果] 心臓血管外科手術件数は、2011 年 10 月～ 2012 年 12 月までの 14 か月間で、OnPump 114 例・OPCAB 76 例であった。2 名とも予定通り 5 ヶ月目から実際に体外循環操作を始めることができ、2012 年 12 月末現在では 2 名とも約 25 例の体外循環操作を経験することが出来た。[考察] 人工心肺業務に関して当院では幸いにも年間約 100 例も経験することができ、技術習得も得やすい環境である。術式によって体外循環方法も確立されており一連の流れや体外循環操作を覚えることができた。[結語] 緊急時にも対応できるようマニュアルまた新人教育のための教育マニュアルも随時更新していかなければならないと考えている。

P11-6

AN ACTION OF EXTRA-CORPOREAL CIRCULATION FOR INFECTIVE ENDOCARDITIS WHICH MERGED HEPATIC CIRRHOSIS, CHRONIC KIDNEY DISEASE FOR HEPARIN-INDUCED THROMBOCYTOPENIA ANTIBODY POSITIVE

HIT 抗体陽性で肝硬変、慢性腎不全を合併した感染性心内膜炎に対する体外循環の取り組み

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[はじめに]HIT 抗体陽性で感染性心内膜炎の手術を想定した ECC の取り組みに関して報告する。[症例]61 歳、女性。肝硬変、慢性腎不全の既往あり、発熱による入院加療中に大動脈弁の感染性心内膜炎（Enterococcus）を発症し、HIT 抗体陽性の診断を得た。その後の再検査にて HIT 抗体は陰性であり、1 回目の結果は擬陽性との診断を得た。[HIT 抗体陽性時の対応] 緊急手術に備え、ECC や体内留置物品において全てノンコートを準備し、血液凝固における回路交換に対応できるシステム構成を検討した。また、維持透析にてアルガトロバンの感受性を評価した。[手術]ECC、体内留置物品は通常通りヘパリンコートを使用した。抗凝固薬はヘパリンを使用し、使用量はヘプコン（メドトロニック社製）にて算出した。手術は問題なく遂行されたが、終了後に静脈貯血槽流出部付近に大量の血栓を認めた。[考察]HIT 抗体陽性の心臓手術においては、抗凝固薬が確立されていない事や出血の助長が文献等より散見される。我々は血液凝固による回路の部分、全交換を念頭に入れたシステム構成で対応しようとした。また、本症例は肝硬変と維持透析を合併しており、出血は容易に想像できたため、アルガトロバンの拮抗目的に血液浄化、MUF による対応を考えた。[結語]HIT 抗体陽性の心臓手術を想定し、予測される状況に対応できるよう取り組みを行った。

P11-7

METHOD OF CARDIOPULMONARY BYPASS CORRESPONDING TO VARIETY OF SURGICAL PROCEDURES OF MITRAL REGURGITATION
僧帽弁閉鎖不全症の様々な術式に対する人工心肺方法

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[はじめに] 僧帽弁閉鎖不全症 (MR) の外科治療には現在様々な術式があり、術式に対応した人工心肺の操作が必要である。我々の施設で経験した MR の各術式における人工心肺方法を報告する。

[方法] 術式は僧帽弁置換術 (MVR)、心停止下僧帽弁形成術 (AP)、心拍動大動脈非遮断下僧帽弁形成術 (BP)、心拍動大動脈遮断下僧帽弁形成術 (CBP)、AP 後心拍動下での僧帽弁の逆流を評価 (ABP)、小切開僧房弁形成手術 (MICS) であった。BP,CB,ABP は心拍動下で僧帽弁の逆流評価を行うために、大動脈ルートカニューレを 2 本挿入し、1 本は冠灌流専用、1 本は圧測定とベント用とした。左心室心尖部より圧測定可能なベントチューブを挿入し、左室ベント回路に設置したチャンバー内の血液量を調節することで左室内圧をコントロールした。僧帽弁の逆流評価は左室圧が大動脈基部圧を越えないように、冠灌流量を調節した。MICS は大腿静脈より QuickDraw カニューレを挿入し、カニューレの先端を SVC に留置し吸引圧を高めてコントロールした。

[結果]2009年1月から2012年12月までの僧帽弁閉鎖不全手術でMVR39例、AP43例、BP15 例、CBP3 例、ABP6 例、MICS4 例を行い、人工心肺のトラブルなく安全に手術を施行できた。

[結語] 人工心肺方法を工夫することで、MR の様々な術式に対応し安全に手術を行うことができた。

P12-1

TREATMENT OF HYPERKALEMIA USING CONTINUOUS HEMODIALYSIS DURING VENO-VENOUS BYPASS IN COMBINED LIVER-KIDNEY TRANSPLANTATION
VENO-VENOUS BYPASS 中に高カリウム血症の是正を目的として CHD を使用した脳死肝腎移植術の 1 症例

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[緒言] 脳死肝腎移植術 (LKT) 中の血清カリウム (K) 値を是正するため Veno-venous bypass(VVB) 中に持続血液透析 (CHD) を施行したので報告する。

[症例] 患者は 51 歳の女性で 2000 年 11 月に生体肝移植を施行した。2010 年 4 月に移植肝の拒絶反応が出現し、同年 8 月より慢性腎不全に対し血液透析を導入した。2012 年 9 月に LKT を施行した。

[方法]CHD は内頸静脈へカテーテルを挿入し血液流量 150ml/min、透析液流量 3500ml/hr で開始した。透析膜は旭化成社製エクセルフロー (膜面積 1.0m^2)、透析液は扶桑薬品工業社製サブラッド BS を使用した。VVB は肝下部静脈から脱血し、腋窩静脈へ送血した。VVB の灌流量は 1.2L/min/m^2とした。

[結果] 術中 K 値の最大値は 3.8mmol/L、最小値は 3.2mmol/L であった。出血量は 22970ml、照射赤血球濃厚液 (RCC) 投与量は 8960ml、水分出納は +3500ml であった。

[考察]LKT は慢性肝腎不全によって出血量の増加や電解質異常を起こしやすく、術中の輸血や臓器保存液の再灌流によって高 K 血症を招来し不整脈や血圧低下を招くと報告がある。結果より出血に対し RCC を 8960ml 投与したが CHD を施行することで K 値の上昇を抑制できた。

[結語]LKT 中の高 K 血症の是正を目的に CHD を用いたことで安定した電解質管理が行えた。

P12-2

PERCUTANEOUS TRANSLUMINAL BALLOON AORTIC VALVULOPLASTY WITH CIRCULATORY ASSIST

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Aim: Percutaneous transluminal balloon aortic valvuloplasty was performed to severe aortic stenosis with severe heart failure.

Subject and method: Patient was 85 y/o female with max aortic valve pressure gradient of 95mmHg, and LMT stenosis of 75% with history of CABG with patent LITA-LAD graft. Left renal artery stenosis was also present with renal failure and creatinine of 2.74mg/dl. Since there was a risk of circulatory collapse with ballooning of the aortic valve, PCPS was prepared. After general anesthesia was introduced, circulatory collapse was observed, and 16Fr venous catheter and 12Fr arterial catheter was introduced through femoral vein and artery to support 1.5-1.8L/min flow. Bleeding from trachea was observed during circulatory support, and ACT control was lowered with use of Fusan with target ACT of 200sec. Amplatz extrastiff J wire 0.035 was introduced to the left ventricle and ballooning was performed with 20mm and 25mm balloon. Rapid pacing with 180bpm was performed during dilatation to avoid left ventricular contraction. With the increase of TAVI to be performed in the future, similar support of the circulation may be needed in high risk patients with severe heart failure.

Conclusion: We report a case of circulatory support during balloon valvuloplasty in patient with severe heart failure.

P12-3

SELECTIVE CEREBRAL PERFUSION FOR TOTAL AORTIC ARCH REPLACEMENT SURGERY
大動脈弓部全置換術に対する我々の選択的脳灌流法

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[対象]1999 年 10 月～ 2012 年 11 月まで胸部正中切開の大動脈弓部全置換術 (TAR) 症例 465 例中、選択的脳灌流法（SCP）を施行した 406 例（うち急性 A 型大動脈解離 87 例）を対象とした

[方法] 無侵襲脳内酸素飽和度（rSO2）は入室時を基準値とした。体外循環確立し、鼓膜温 23 度・直腸温 30 度未満で循環停止し脳灌流用カニューレを用い頚部 3 分枝 SCP 確立し大動脈末梢吻合終了後、体循環再開し復温を開始した。大動脈中枢吻合に移行し復温に伴い SCP 流量を調整した。大動脈中枢吻合終了後、頸部分枝を再建し体外循環を離脱した。急性 A 型大動脈解離は左右鼓膜温、左右橈骨動脈圧、下肢圧、rSO2 を測定し大動脈遮断を行った。大動脈遮断後、各測定値に変化なければ上行大動脈切開し中枢断端形成に移行する。測定値が変化すれば大動脈遮断を解除し複数送血路を確保し中心冷却を続行して循環停止とする

[結果] 各平均は体外循環 190 分、心虚血 91 分、循環停止 42 分、SCP97 分、年齢 74 歳、最低鼓膜温 21.4 度、最低直腸温 25.7 度、術後脳梗塞 14 例 4.1%、一過性脳神経障害 21 例 6.2%、30 日死亡 8 例 2.3%であった

[結語]TAR に対する SCP で血圧・Hb・rSO2・温度等を厳重に管理し良好な成績を得ている

P12-4

BRAIN PROTECTION STRATEGY IN AORTIC ANEURYSM SURGERY
大動脈瘤手術における脳保護戦略

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当院では、超低体温循環停止下での脳保護法として、選択的脳灌流法（SCP）の他に、逆行性脳灌流法（RCP）の脳保護効果増大を図る間歇的静脈圧増強逆行性脳灌流法（IPA-RCP）や左開胸下逆行性脳循環法（髙本法）を用いている。脳保護法の選択基準は、動脈瘤の位置や性状、置換範囲、アプローチ方法など術前によく検討し総合的に判断している。大血管手術における体外循環法は施設によって考え方が異なるため、方法や手技は多種多様であり、各脳保護法には利点欠点が存在する。SCP に比べ RCP の利点として、回路構成が通常の体外循環で使用する回路で行えること、手技が煩雑ではないことなどが挙げられる。しかし、時間的制約や、実際の脳還流がどの程度流れているか、最適な圧や温度、送血方法は未だ議論の余地が残されている。

脳保護効果の評価は、術中の脳内局所酸素飽和度（ｒ SO2）モニタの推移、術後の脳神経学的所見とし、SCP と RCP で比較したところ、RCP はｒ SO2 の軽度低下を認めたが、術後の脳合併症など有意差はなかった。

今後、より最適な脳保護を安全に行うため、各脳保護法に対応できる回路構成の簡素化や、圧・流量の管理の工夫が必要であると考える。

P12-5

EXTRACORPOREAL CIRCULATION STRATEGY IN THE THORACIC AORTA ANEURYSM SURGERY
胸部大動脈瘤手術における体外循環戦略

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[緒言] 当院における胸部大動脈瘤手術に対する体外循環戦略について報告する。[対象]2010 年 1 月から 2012 年 12 月の期間で緊急症例を含めた大動脈解離症例、真性大動脈瘤症例全 39 例を対象とした。[方法] 体外循環法は SVC、IVC の 2 本脱血、送血は central cannulation を基本とし、epi aortic echo にて最適な箇所を選択。解離症例のみ経心尖部大動脈送血としている。基本手術方針として、鼓膜温 20℃での循環停止 (CA) までは aorta non touch とし、Core cooling による VF に対して LV vent に注意し、積極的に CPZ を使用する。脳保護法は上田法による逆行性脳灌流法 (RCP) もしくは、1 ポンプ 3 分枝送血による選択的順行性脳灌流法 (SCP) を併用。心筋保護法は全例に逆行性持続的心筋保護法 (RC-CBCP) を用いている。また、遮断解除時や循環再開時には DUF を適時行う。[考察] 胸部大動脈瘤手術では、その病態、手術手技などにより送血方法、温度管理、心筋保護法や脳保護法が異なる。当院では順行性流量を優位とした送血法と、低体温、確実な脳分離体外循環を併用することで high risk で長時間の手術に対応し、合併症の発生を抑えられるよう最大限努めている。[結語] 当院の胸部大動脈手術における体外循環戦略を報告した。今後も検討を重ね、より安全で安定した体外循環を目指したい。

P12-6

COMPARISON OF PULSATILE AND NON-PULSATILE PERFUSION DURING OPEN HEART SURGERY IN PATIENTS WITH RENAL FAILURE

開心術における腎機能低下症例を対象とした拍動流と非拍動流体外循環の比較

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はじめに

腎機能低下症例に対する開心術の体外循環において、拍動流体外循環が非拍動流に比し腎保護に有用かを昇圧剤投与量、術後血清クレアチニン（CRE）上昇の点にて比較した。

対象と方法

2008 年 10 月から 2012 年 8 月までの遠心ポンプを用いた体外循環（CPB）症例のうち e-GFR60ml/min 以上の腎機能症例、維持透析、循環停止を除く CPB3 時間以上の症例を対象とした。拍動流 11 例を P 群、非拍動流 44 症例を NP 群とした。塩酸フェニレフリン・ノルエピネフリン投与量、投与率、術前 e-GFR、ICU 帰室・手術 1 日目・2 日目の CRE、尿量、ICU 滞在日数等を比較検討した。

結果と考察

ノルエピネフリン平均投与量と投与率は P 群 0mg·0%、NP 群は 0.4mg·50%であった。術前から手術 2 日目までの CRE 上昇は P 群 0.2、NP 群 0.6mg/dL（P=0.03）で有意に NP 群が高値であり、その他の項目に有意差を認めなかった。低腎機能症例に対する拍動流は、ノルエピネフリン投与の機会を減らし術後腎傷害を回避しうることが示唆された。非拍動流時に低灌流圧を認めた際、拍動流に切り替えれば昇圧剤投与量が減少し腎保護に有用であると考えられる。

結語

遠心ポンプを併用した拍動流体外循環は、昇圧剤投与を回避することで、腎機能低下症例に対してさらなる腎傷害発症リスクを回避できる安全な手法である。

P12-7

PRE-OPERATIVE PREDICTION OF URINE OUTPUT DURING CARDIOPULMONARY BYPASS

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OBJECTIVE

It is important to monitor the volume of urine output during cardiopulmonary bypass (CPB) because it is not only a direct indicator of renal blood flow, but also an indirect indicator of systemic organ perfusion. However, it is difficult to predict the amount of urine output during CPB. In this report, we retrospectively investigated whether estimated Glomerular Filtration Rate (eGFR) and creatinine level (Cr) were associated with volume of urine output during CPB. Furthermore, we designed a new formula to calculate the predicted amount of urine output during CPB.

METHODS

This study included 28 patients who underwent single-valve replacement surgery from April to November 2012 at our institution. We investigated the correlation of eGRF and Cr with intraoperative urine volume output (mL/h/kg) using Pearson correlation analysis. Additionally, we performed multiple regression analysis to calculate the predicted amount of urine output. The threshold for correlation coefficient was set as $r = 0.5$, and $p<0.05$ indicated statistical significance.

RESULTS

Average extracorporeal circulation time, urine volume, eGFR, and Cr level were 160 ± 50 minutes, 16.4 ± 10.3 mL/h/kg, 67.8 ± 18.9 (mL/min/1.73m^2), and 0.8 ± 0.2 mg/dL, respectively. There were significant correlations between intraoperative urine volume and eGRF, and Cr, $r = 0.5$ ($p<0.05$), and $r = 0.6$ ($p<0.05$) respectively. In addition, predicted urine volume was $40.5 + 0.03 \times$ eGFR-$26.6 \times$ Cr, calculated from the linear regression.

CONCLUSIONS

We verified the correlation of eGRF and Cr with CPB intraoperative urine volume output. Moreover, we confirmed that predicting the amount of urine output during CPB using a formula was possible. However, further refinement of the formula is required to increase its accuracy.

P13-1

DOBUTAMINE INDUCED CARDIOGENIC SHOCK DUE TO SYSTOLIC ANTERIOR MOTION AFTER MITRAL VALVE REPAIR: CASE REPORT

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Reports of systolic anterior motion (SAM) after mitral valve repair are not infrequent, with an incidence of 4-10%. However, most cases of SAM show a mild or moderate pressure gradient across the left ventricular outflow tract (LVOT), and it is well tolerated.

Catecholamine (dobutamine) is frequently administered for postoperative support of unstable hemodynamics. However, in some mitral valve repair patients, catecholamine induces significant LVOT obstruction and can cause cardiogenic shock in patients with basal septal hypertrophy by inducing a hyperdynamic state.

In this report, we present a case of dobutamine induced SAM after mitral valve repair resulting in sudden cardiogenic shock with systolic murmur. After cessation of dobutamine therapy and parenteral administration of a large volume of fluids, the patient showed immediate recovery from the shock.

P13-2

USE OF DOUBLE-PLICATED POSTERIOR LEAFLET AS THE ANCHOR OF MITRAL VALVE REPLACEMENT IN CASES OF MITRAL ANNULAR CALCIFICATION

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OBJECTIVE:

Mitral regurgitation (MR) with severe mitral annular calcification (MAC) forces the surgeons to difficult situations. The objective of this study is to evaluate long-term durability of a modified method against MAC.

METHODS:

The method is targeted for severe MAC of the posterior leaflet with extensive degeneration which needs mitral valve replacement (MVR). MVR is performed by anchoring the cuff on double-plicated posterior leaflet, and by reinforcement with an equine pericardium.

Anterior leaflet is resected, leaving posterior leaflet preserved. Pledgeted mattress sutures are placed on the posterior leaflet itself in the manner as to plicate it twice. The sutures are then passed through an equine pericardium, and then through the cuff of a prosthetic valve. The equine pericardium is sutured to the left atrial wall with running stitches as to cover the MAC. The anterior side of the artificial valve is sutured to the annulus with usual everting mattress stitches.

RESULTS:

The method was applied to a 62-year-old man. Post-operative course was without major problems. After discharge, he is being followed-up for thirteen years. The results of his recent echocardiogram were without perivalvular leakage, and without any problems around the pericardial patch. The advantages of this method are to fold the posterior leaflet twice in order to create a new annulus above MAC; to use equine pericardium as a reinforcement of suture and as a preventive sheet of perivalvular leakage.

CONCLUSIONS:

With the use of double-plicated posterior leaflet as the anchor of MVR and equine pericardium as reinforcement, long-term excellent results can be obtained in MR with MAC.

P13-3

BI-LEAFLET MECHANICAL PROSTHESES ARE SUITABLE FOR A MAJORITY OF RHEUMATIC MITRAL VALVE PATIENTS IN A DEVELOPING COUNTRY

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Background: In developing countries rheumatic heart disease in a young and uneducated population poses a challenge in the choice of valve prostheses. Our study correlated the degree of INR compliance with outcome, to justify using mechanical mitral valve prostheses in our patients with less than optimal compliance with anticoagulation.

Patients and Methods: Between 2000 & 2010, 246 consecutive single mitral valve replacements with bileaflet mechanical prostheses were performed in adult patients with rheumatic valve disease.

Partition modeling was used to identify a cut point of INR control to separate patients with better and poorer outcome respectively.

Results: Follow-up was 96% complete (n=246) & ranged from 0 months to 120 months [Mean 48+−34.2] There was no difference between the patients with traceable & non-traceable INRs regarding outcome, but significantly more females & younger patients were found in the non-traceable group.

Partition modeling: Where INR data was available, an INR cut point of 34% (based on % of tests falling within the therapeutic range for each patient) allowed the formation of two mechanical valve recipient subgroups (<34%; n=110 and >=34%; n=54)

Time to death or redo was 80.5±4.3% vs 93.6±3.6% at 5 years and 43.0±20.1% vs 93.6±3.6% at 10 years for the <34% and >=34% groups respectively (p=0.010).

Conclusion: Modern bileaflet prostheses perform well in the mitral position, particularly if >34% of INR values are within the therapeutic range. However, even our patients with poorly controlled INRs, 5-year freedom from valve related death was higher than in previous reports from developing countries. Thus, a majority of patients in a developing country qualify for a mechanical mitral valve with modern bi-leaflet design.

P13-4

AGGRESSIVE ATRIAL VOLUME REDUCTION FOR BILATERAL GIANT ATRIA IMPROVES RESPIRATORY FUNCTION

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A giant left atrium can cause respiratory dysfunction and hemodynamic disturbance postoperatively. Here, we describe a rare case of giant left and right atria combined with reduced vital capacity (VC) of the lungs.

CASE: A 79-year-old woman was referred to our institution for dyspnea on effort. An echocardiogram showed severe mitral and tricuspid regurgitation. The left atrial diameter was 71.8 mm. Computed tomography (CT) revealed that the left and right atrial volumes were 1400 and 760 ml, respectively. The VC was only 1080 ml (54%).

METHDS: We chose a circular left atrial reduction and resection of the intra-atrial septum and right atrial free wall. During surgery, the left-side left atrial wall was incised 5 mm above the pulmonary vein orifices, and the heart was divided from the bottom of the left atrium. The enlarged left atrial wall was then resected with the left atrial appendage in a circular shape. As the mitral valve pathology was annular dilatation, a Physio II Annuloplasty Ring 26 was implanted. The upper and lower cut lines were then sutured together. The right atrial volume was reduced. The tricuspid valve pathology was annular dilatation, so an MC3 Annuloplasty Tricuspid Ring 26 was implanted. The patient was extubated 1 day postoperatively, and discharged 26 days postoperatively.

RESULTS: One year postoperatively, the patient was classified as NYHA functional class 1. An echocardiogram showed no mitral regurgitation and mild tricuspid regurgitation. CT revealed markedly reduced left and right atria, with volumes reduced to 300 and 250 ml, respectively, and well-expanded lungs. The VC was 1370 ml (27% increase).

CONCLUSIONS: We report the effect of reducing two giant atria on respiratory function. Our surgical tips for performing atrial reduction are to resect as much volume as possible and to make the left atrial resection line circular.

P13-5

MYECTOMY FOR VENTRICULAR OUTFLOW TRACT OBSTRACTION ASSOCIATED WITH MITRAL REGURGITATION CAUSED BY SYSTOLIC ANTERIOR MOTION

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OBJECTIVE
Systolic anterior motion (SAM) of the mitral valve is typically observed in patients with hypertrophic obstructive cardiomyopathy (HOCM) or following mitral valve repair. SAM can sometimes result in severe left ventricular outflow tract (LVOT) obstruction or mitral regurgitation (MR). Septal myectomy has been reported to be effective for relieving SAM in patients with HOCM, however, surgical experiences were limited. Furthermore, there are very few case reports of myectomy for patient with SAM after mitral valve repair. This paper presented a review of septal myectomy in three patients with severe LVOT obstruction associated with MR.

METHODS
This study is a retrospective clinical chart review of three patients who underwent septal myectomy for LVOT and concomitant MR caused by SAM. Two patients had HOCM. Interventricular septal thickness and LVOT peak gradient were 16 mm, 129.5 mmHg and 19 mm, 101 mmHg, respectively. One patient had a mitral posterior leaflet prolapse with ruptured chordae and mild hypertrophic septum without obstruction of the LVOT. SAM and the resulting LVOT obstruction (LVOT peak gradient was 143.5 mmHg) and MR occurred after a posterior leaflet quadrangular resection with annuloplasty ring. The main cause of SAM was considered to be a hypertrophic septum and transaortic septal myectomy was performed.

RESULTS
Predischarge transthoracic echocardiogram showed no findings of SAM and improvement in MR in all three cases. Interventricular septal thickness and LVOT peak gradient in two patients with HOCM were 16 mm, 14.3 mmHg and 18 mm, 36.7 mmHg respectively. It was 10 mm and 2.6 mmHg in the patient following mitral valve repair. Postoperatively patients were uneventful.

CONCLUSION
Three patients with LVOT obstruction associated with severe MR caused by SAM, could be treated by septal myectomy without mitral valve replacement, and obstruction and MR were significantly reduced in all three cases.

P13-6

PERIOPERATIVE DIASTOLIC FUNCTION AND ITS IMPACT ON SURVIVAL AND CARDIAC EVENTS OF PATIENTS AFTER SURGICAL VENTRICULAR RESTORATION

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Objective: The impact of surgical ventricular restoration (SVR) remains debated particularly with regard to a potential negative effect on diastolic function.
Methods: Between 1999.2 and 2012.6, 71 patients with ischemic cardiomyopathy and/or LV aneurysm who underwent SVR are included in this study. Mean follow up period was 61±43month(100%). Perioperative echocardiographic parameters were compared, clinical follow-up and risk factor analyses for deaths and cardiac events (cardiac death, hospitalization with heart failure, intractable arrhythmia and LVAD) were performed with Cox proportional hazards model. The actuarial freedom from death and cardiac events were computed using the Kaplan-Meier technique, and p value<0.005 is considered significant.
Results: Mean age was 64±9 (56 male).Preoperatively, NYHA class was 2.5±1.1, renal insufficiency(CCR<40) was present in 21 (28%), DM in 20 (28.1%) and IABP with 4 patients(5.6%). Preoperative echocardiographic data were; LVESVI=77±40ml/m2,LVEF=33±11%,MRgrade=1.3±1.1,deceleration time(DT)=198±54 msec and E/E'=15.9±9.6. Mode of SVR was Dor in 47, SAVE in 12, Linear closure in 6, and overlapping in 6, and CABG and MV procedure were performed concomitantly in 59 (83%) and 22(31%). Postoperatively, LV systolic function was significantly improved (LVESVI= 49±31ml/m2 and LVEF=42.1±11.7%) with symptomatic relief(NYHA class=1.3±0.7) with LVESVI reduction rate of 33.8±21.9%. Despite the significant improvement of LVEDP(19.7±8.5 to 15.5±7.3 mmHg; p=0.03), DT decreased (198±54 to 150±46msec; p<0.0001) and E/E' increased (16±10 to 21±17; p=0.04) significantly postoperatively. No patient showed improvement in TMI pattern. Freedom from death and cardiac events at 5 years were 78+5% and 64±6%. Univariate analyses revealed LVEF,LVEDVI, and LVESVI as non-significant, whereas DT,E/E' and TMI pattern significant for predicting cardiac events, both pre-and-postoperatively. Multivariate analyses revealed that age (p=0.004) is significant risk factor for death, and preoperative MR(p=0.0029) and postoperative TMI pattern (restrictive pattern) (p=0.01) for cardiac events.
Conclusion:Despite positive impact on systolic function, SVR have negative impact on diastolic function, which correlates more with cardiac events in follow-up.

P13-7

EXTRACORPOREAL MEMBRANE OXYGENATION FOR POSTOPERATIVE ARDS

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Background

Extracorporeal membrane oxygenation (ECMO) has been established as an important treatment modality to treat severe ARDS in various clinical settings; however, its outcomes in post-surgical settings have not been elucidated.

Methods

From January 2007 through December 2011, a total of 49 patients (aged 59.4±11.4 years, 15 females) who were supported with veno-venous ECMO to treat postoperative ARDS were reviewed.

Results

Surgery involved cardiac surgery in 4, lung resection in 7, esophageal reconstruction in 3, liver transplantation in 23, kidney transplantation in 3 and others in 9. Median interval between surgery and ECMO initiation was 10 days (0-371 days), and median duration of pre-ECMO ventilator support was 5 days (0-37 days). At the time of ECMO institution, mean PaO2/FiO2 was 61.1±22.7, mean Murray Lung Injury Score was 2.9±0.4, 19 patients (38.8%) showed shock and 35 (71.4%) required continuous renal replacement therapy (CRRT). 12 patients (24.5%) required conversion to veno-arterial ECMO due to refractory shock. 27 patients (55.1%) died during ECMO support and 22 patients (44.9%) were weaned off from ECMO successfully. Of the latter 22 patients, 14 patients eventually died in-hospital, resulting in 8 hospital survivors (16.3%). On multivariable analyses, pre-ECMO ventilation duration emerged as a significant and independent predictor of death (RR 1.05, 95% CI 1.01-1.08, P=0.006), whereas the use of CRRT was found to be associated with improved survival (RR 0.48, 95% CI 0.24-0.96, P=0.038). When the predictive value of pre-ECMO ventilation duration for death was assessed using the receiver operating characteristic curve, the greatest accuracy was obtained at the cutoff value of 5.5 days, with 62.3% sensitivity and 80.0% specificity.

Conclusions

Although overall survival following ECMO for postoperative ARDS was grave, ECMO offered an invaluable opportunity for survival in patients whose survival cannot be expected by conventional therapy.

P13-8

EXPERIENCE WITH INTRODUCING VENTRICULAR ASSIST DEVICE THERAPY TO A JAPANESE PUBLIC HOSPITAL

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In Japan, the national health insurance started covering implantable ventricular assist devices (VADs) for patients with severe heart failure in 2011.

At Saku Central Hospital, external VADs have been placed in 7 patients since 2010.

We also inserted 3 implantable VADs in 2012, enabling patients to wait for heart transplantation at home even in rural area at Nagano Prefecture. Promoting cooperation with transplantation facilities is a key factor for introducing VADs therapy.

P13-9

CLINICAL EXPERIENCE WITH THE JARVIK 2000 LEFT VENTRICULAR ASSIST SYSTEM AS DESTINATION THERAPY FOR THE ELDERLY

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OBJECTIVE

Left ventricular assist devices(LVADs) have been approved by the U.S. Food and Drug Administration(FDA) as a bridge to heart transplantation and destination therapy(DT). In January 2010, HeartMate II was approved by the FDA for destination therapy and LVADs are increasingly being used as DT in western nations. In Japan, the DuraHeart and EVAHEART obtained formal insurance reimbursement in April 2011. But they are limited to use as a bridge to transplantation for patients under the age of 60. In our aging society, we experience a number of elderly patients suffering from end-stage heart failure who need device support to live. Here we report a case of a 78-year-old man supported with an LVAD, the Jarvik 2000, as DT for end-stage heart failure.

METHODS

A 78-year-old man suffering from ischemic cardiomyopathy with a left ventricular ejection fraction below 20% underwent off-pump coronary artery bypass with intra-aortic balloon pump support. He could be extubated the day after surgery and started physical rehabilitation. But he couldn't recover from inotrope dependent heart failure(INTERMACS profile3) in New York Heart Association(NYHA) classIV. We decided to implant the Jarvik 2000 as DT.

RESULTS

The patient was extubated the day after implantation and inotropic support became unnecessary 4 days after implantation. He underwent physical rehabilitation and returned to NYHA classI. Anticoagulation therapy was given to maintain the international normalized ratio at 2.0 to 2.5. We had no device-related infections. He was discharged home 91 days after implantation on his own foot. But severe brain hemorrhage occurred at home and he died 108 days after implantation.

CONCLUSIONS

LVADs implantation for elderly patients is controversial. In our case, although it was short period, he could spend time with his family at home. The demand for implantable LVADs as DT will be high for this aged society in Japan.

P13-10

TEMPORARY RIGHT VENTRICULAR SUPPORT WITH A MONOPIVOT CENTRIFUGAL BLOOD PUMP AS A BRIDGE TO DECISION FOR PATIENTS WHO REQUIRE BIVENTRICULAR ASSIST

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Background: Right heart failure is a critical complication in patients with mechanical ventricular support. However, it is often difficult to apply an adequate right ventricular assist device (RVAD) in the acute phase. Extracorporeal centrifugal pump is a simple device to operate, but bleeding or thromboembolism can be a serious complication. In this study, we evaluate our strategy in which a monopivot centrifugal blood pump (MCBP) is used as an RVAD in the acute phase to treat severe biventricular failure.

Methods: Patient records were retrospectively reviewed. During left ventricular assist device (LVAD) implantation, an MCBP with or without an artificial lung was used if an RVAD is required. The system was established with the right atrial drainage and the pulmonary arterial perfusion with subcutaneous tunneling cannulae. After stabilizing the patient in the intensive care unit, the RVAD was discontinued or replaced with a pulsatile pump according to the result of discontinuation test.

Results: Three cases including dilated cardiomyopathy (case 1), acute myocardial infarction (case 2), and fulminant acute myocarditis (case 3) that required biventricular assist with an MCBP as an RVAD were identified. A paracorporeal pulsatile pump was used as an LVAD in all 3 cases. Case 1 underwent a discontinuation test 30 days after the operation which was unsuccessful. Therefore the MCBP was replaced with a pulsatile pump 5 days later. Case 2 underwent a discontinuation test 3 days postoperatively and was successfully separated from the RVAD. Case 3 is currently on MCBP support. There was no thromboembolism or excessive bleeding.

Conclusion: Use of an MCBP as an RVAD in the acute phase of severe biventricular failure was feasible, safe and very useful for bridge to bridge or bridge to decision, allowing physicians some time to think over.

P14-1

BENEFIT OF AORTIC VALVE REPLACEMENT FOR PATIENTS 80 YEARS OR OLDER WITH SEVERE AORTIC STENOSIS

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Background: Aortic stenosis (AS) becomes increasingly common in the aging population. We evaluated the surgical effect of aortic valve replacement (AVR) for elderly patients in Japan. **Methods and Results**: We prospectively followed 52 consecutive patients over 80 years of age with severe AS defined by aortic valve area < 0.9cm^2. During a median follow-up of 28 months, 26 patients underwent AVR (group S) and 26 were treated medically (group M). 5-year survival in group S was 76% compared with 66% in group M (p=0.8). The predictor of medium-term survival was left ventricular ejection fraction < 0.4 (OR4.8, p=0.04). Major adverse cardiac event free (MACE) survival at 5 year was 83% in group S compared with 22% in group M (p=0.01). AVR significantly reduced the incidence of MACE (OR 0.2, p=0.02). The predictors of MACE were age (OR 1.2, p=0.02) and coronary artery disease (OR3.8, p=0.03). **Conclusions**: The surgical intervention for octogenarians did not improve their survival, but obviously prevented MACE. AVR appears to improve quality of life of these patients.

P14-2

EARLY AND LATE OUTCOMES OF VALVE REPLACEMENT FOR OCTOGENARIANS WITH AORTIC STENOSIS IN THE LAST DECADE

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OBJECTIVE Octogenarians is considered the high risk group for aortic valve replacement (AVR). In Europe and the US, transcatheter aortic valve replacement has become the treatment of aortic stenosis in the patients who are at high surgical risk. The aim of this study was to clarify early and late outcomes for conventional AVR for octogenarians with AS in the last decade. **METHODS** 262 AS patients underwent conventional AVR in the last decade. Of these patients, 166 patients were equal or more than 70 years old and divided into the following two group (mean age, 76.0 years; 91 female), group O (n=38): octogenarians, group S (n=128) septuagenarians. Early surgical outcomes were compared between these two groups. **RESULTS** Preoperative characteristics were almost the same except for NYHA classification. The rate of the patients of NYHA class III or IV was greater in group O (34.2%, 18.3%, $p<0.05$). In-hospital mortality was 0% in group O, and 3.0% in group S ($p>0.05$). The rate of major postoperative complication was not different between two groups. The patients with any compromised status at discharge was more frequent in group O (23.7%, 4.8%, $p<0.01$). 5-year survival after AVR was 90.3 ± 6.8% in group O and 90.5±3.5 ($p>0.05$). 5-year survival of the patients with any compromised status at discharge was significantly lower in comparison with the patients not affected at discharge (59.2 ±16.9%, 95.9±2.1%). **CONCLUSIONS** Early and mid-term outcomes of conventional AVR for octogenarians was satisfactory, however, compromised patients at discharge were more frequent in octogenarians and the late survival of these patients was worse.

P14-3

AN INVESTIGATION INTO CASES IN WHICH AORTIC VALVE REPLACEMENT WAS CARRIED OUT TO TREAT AORTIC STENOSIS IN ELDERLY PATIENTS (AGED 75 YEARS OLDER)

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Objective:

An investigation was carried out regarding cases undergoing valve replacement for aortic stenosis in patients aged 75 older.

Methods: Subjects included 44 patients aged 75 older (average age: 79.6±3.8-years, 15 men, 29 women) (aged 75 to 92) among patients undergoing aortic valve replacement for aortic stenosis (April 2004 to November 2012). Preoperative NYHA functional classification - I: 7, II: 25, III: 9, and IV: 3 cases. The pressure gap between the left ventricle and aorta upon heart echo testing was 91.5±27.5mmHg. Complications included 13 coronary lesions and 6 cerebrovascular disease cases. The body surface area was 1.36±0.16cm^2 . Emergency surgery and semi-emergency valve replacement surgery were conducted on 2 aortic stenosis exacerbation cases following coronary artery bypass. The preoperative risk evaluation was: logistic Euro-SCORE 7.1±3.8% and Japan-SCORE 4.2±3.8%.

Results:

Valve cases in aortic valve replacement surgery: biological valve CEP: 19mm: 15, 21mm: 4, magna 19mm: 15, magna 21mm: 2, and Mosaic 19mm: 1 case. Mechanical valve cases: SJM regent: 17mm: 5, regent 19mm: 1, and HP 17mm: 1 case. Combination surgical cases: ascending aorta wrapping: 2, ascending aorta substitution: 2, coronary artery bypass: 9, mitral valve replacement: 2, mitral annuloplasty: 1, and tricuspid valve plasty: 2 cases. The EOA Index dividing the artificial valve effective valvular area with the body surface area was: 1.06±0.18cm^2 /BSA, with EOAI 0.8cm^2 /BSA or less not observed. There were 2 LOS cases (4.5%) of in-hospital death: one heart failure case from malnutrition and one declining ADL case from Parkinson's disease following esophageal cancer radiation. Major postoperative complications cases included: 1 case each of cerebral infarction, re-thoracotomy from hemorrhaging, and re-thoracotomy from pericardial fluid retention 10 days following surgery, regarding patients aged 80 older.

Conclusions:

More careful perioperative care is required regarding patients 80 years older.

P14-4

PERFORMANCE OF THE NEW EUROSCORE II IN PREDICTING EARLY MORTALITY IN PATIENTS UNDERGOING AORTIC VALVE REPLACEMENT

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Background: The original EuroSCORE has been widely used as a risk prediction model after adult cardiac operation. The aim of this study was to examine the ability and performance of a new version of the EuroSCORE, named EuroSCORE II, in patients undergoing aortic valve replacement (AVR).

Methods: We analyzed the data from 258 consecutive patients who underwent AVR for aortic stenosis (AS), with or without CABG, between 2002 and 2010. Patients were stratified into three groups according to risk prediction by the EuroSCORE II: low-risk (0-4.9%), moderate-risk (5-9.9%), high-risk (10% and over).

Results: There were 217 low-risk, 28 moderate-risk, and 13 high-risk patients. Actual operative mortality for low-risk, moderate-risk, and high-risk was 2.3%, 7.1%, and 30.7%, respectively. The mean EuroSCORE II for each respective group was 2.1%, 6.4%, 19.9%, and so the observed/expected (O/E) ratio for each group was 1.10, 1.09, and 1.54, respectively. Therefore, the calibration ability was better in low and moderate-risk patients than high-risk patients. In all patients, Hosmer-Lemeshow goodness-of-fit test indicated good accuracy for the prediction of mortality (p=0.59), but the area under the ROC curve was 0.69 (95% CI; 0.48 to 0.89), implying that the discrimination ability was suboptimal.

Conclusions: Good calibration ability of EuroSCORE II was seen in low and moderate-risk patients, but underestimation of the operative risk was observed in high-risk patients. Another concern is the suboptimal discrimination power. These results have implications for risk judgment by the EuroSCORE II in patients undergoing AVR for AS, but larger validation studies are necessary to confirm the above findings.

P14-5

THE PERFORMANCE OF NICKS OPERATION FOR AORTIC VALVE STENOSIS

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OBJECTIVE: The purpose of this study was to determine the safety of Nicks operation for aortic valve stenosis.

METHODS: Nicks operation was performed in 23 cases of aortic valve stenosis from 1997 to 2012. Mean age was 69±11years and body surface area 1.47±0.16m^2. This group included 5 men and 18 women. Perioperative analysis and long-term prognosis were carried out this group.

RESULTS: Details of groups A and B were as follows: duration of surgery 279±46 min, duration of extracorporeal circulation 155±34 min, duration of cardiac arrest 113±32 min, blood loss 383±167 ml, and postoperative hospital stay 30±21 days. Mechanical valve was used in 9cases and bioprosthetic valve in 14 cases. There was 1 case of allogeneic transfusion and 1 case of postoperative deaths.9 cases were bicuspid aortic valve. The ten year survival rate was 82%. One case experienced re-aortic valve replacement 8 years after initial operation.

CONCLUSION: Nicks operation of this hospital is a valid operation.

P14-6

A CASE OF AORTIC VALVE REPLACEMENT AND GRAFT REPLACEMENT OF ASCENDING AORTA FOR UNICUSPID AORTIC VALVE WITH DILATATION OF ASCENDING AORTA

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The patient, 57 y.o male, had been pointed out cardiac murmurs previously. He had seen doctor regularly for Hypertension and valvelar cardiac check by echocardiography. In progression he felt dyspnea on exertion and were referred to our hospital. Physicians revealed that surgical intervention was required for severe aortic stenosis(max LV-Ao PG 76 mmHg) and dilatation of ascending aorta(dia. 52 mm). We peformed aortic valve replacement and graft replacement of ascending aorta under deep hypothermic cardiac arrest and retrograde cerebral perfusion. Though preoperative echocardiography showed bicuspid or tricuspid aortic valve, aortic valve was Unicuspid valve indeed. I discussed unicupid aortic valve based previous repotrs.

P14-7

ST. JUDE MEDICAL TRIFECTA TM AORTIC BIOPROSTHESIS: THE TRAINING PERSPECTIVE

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OBJECTIVE: The St. Jude Medical Trifecta TM aortic supra-annular bioprosthesis provides exceptional haemodynamic performance, durability and implantability. The unique design of the valve, encompassing a contoured silicone insert within a unique cuff is specifically designed to conform to the native annulus shape for proper seating and minimal risk of paravalvular leak. The aim of this prospective study was to evaluate midterm haemodynamic performance of valves implanted by cardiothoracic trainees at a single UK centre.

METHODS: Fifteen consecutive patients undergoing aortic valve replacement using the Trifecta TM valve performed by trainees at a single UK centre over a 24-month period were included in this study. Patients undergoing concomitant cardiac procedures were included. Assessment of haemodynamic function was carried out using transthoracic echocardiography pre-operatively and at follow-up, as well as transoesophageal echocardiography intra-operatively.

RESULTS: The study population consisted of 15 patients (9 male, 6 female). Mean age was 71.7 ±7.6 years. Sizes of implanted valves included 19mm (n=1), 21mm (n=4), 23mm (n=7), 25mm (n=2) and 29mm (n=1). Overall mean post-operative pressure gradients were 6.91 ±1.59mmHg (mean) and 13.99 ±4.79mmHg (peak). Overall mean post-operative left ventricular ejection fraction was 51 ±0.12%. Overall mean effective orifice area was 1.68 ±0.5cm2. All valves were well-seated and only 1 exhibited trivial regurgitation.

CONCLUSIONS: Our experience demonstrates the excellent haemodynamic performance of the Trifecta TM bioprosthesis in implantations performed by surgical trainees, resulting from the innate superior haemodynamic properties of the Trifecta TM valve as well as the simple yet faultless implantability of the valve.

P14-8

ST. JUDE MEDICAL TRIFECTA TM AORTIC BIOPROSTHESIS: AN ASSESSMENT OF MIDTERM HAEMODYNAMIC FUNCTION

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OBJECTIVE:

The St. Jude Medical Trifecta TM valve represents the next generation of aortic supra annular bioprosthesis. No literature currently exists on the 'real-world' performance of this valve. The aim of this prospective observational study was to evaluate the haemodynamic performance over midterm follow-up.

METHODS:

Ninety-nine consecutive patients undergoing aortic valve replacement with St. Jude Medical TrifectaTM at a single UK centre were included in this study. Data was collected over a 24-month period. The subjects were evaluated pre-operatively, at end of operation (transoesophageal echo), and prior to discharge (transthoracic echo). During this experience with the St. Jude Medical TrifectaTM valve we have implanted 19, 21, 23, 25 and 27mm valves.

RESULTS:

The mean subject age was 73.2 ±5.7 years. The mean post-operative pressure gradients were 8.78 ±3.6 mmHg, 8.13 ±2.3 mmHg, 8.26 ±3.5 mmHg, 7.01 ±3.8 mmHg, 7.27 ±2.7 mmHg, respectively, for valves sized 19mm (n=6), 21mm (n=26), 23mm (n=47), 25mm (n=16) and 27mm (n=4). On echocardiography assessment all valves were well seated. Moderate-severe paravalvular leak was observed in one patient and mild-moderate leak in another. Otherwise there were only 14 patients with trivial regurgitation.

CONCLUSIONS:

The results of our early experience with this new valve indicate that it offers excellent haemodynamic performance in the 19, 21, 23, 25 and 27mm sizes. The mean gradients compared favourably to other supra-annular aortic bioprostheses currently available.

P14-9

WITHDRAWN

P14-10

ON-X AND CARDIAMED MECHANICAL VALVE PROSTHESES: RETROSPECTIVE ANALYSE

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Purpose: to evaluate and compare mid-term follow-up after mitral, aortic and double valve replacement using On-x and Cardiamed mechanical valve prosthesis.

Methods: Since 2003 till 2012 in our centre we perform 2213 mechanical valve replacements. Group 1 (Cardiamed): AVR 598 patients, MVR - 967, DVR -234. Group 2 (On-X): 133, 237 and 44 patients respectively. Both groups were comparable for anthropometric, echocardiographic, comorbid, and operative techniques characteristics.

Results: Mean follow up 7 years. Freedom from valve related events in Group1 and Group 2: from structural dysfunction 100% in both groups; from leakage 99,88% and 100%; from nonstructural dysfunction 99,88% and 99,36%; from thrombosis 99,55% and 99,04%; endocarditis 99,77% and 100%; LV rupture 99,95% and 99,68%; total freedom from re-operation 99,05% and 98,08% respectively.

Conclusions: Cardiamed and On-x mechanical valve prostheses show good mid-term results, which comparable with another modern bileaflet mechanical valves.

P14-11

MIDTERM CLINICAL OUTCOME OF THE STENTLESS BIOPROSTHESIS FOR AORTIC VALVE STENOSIS

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Background: The orifice area of the stentless valve is larger than the stented valve in the same annulus. It is expected that the stentless valve can improve hemodynamic performance. We have been actively using the stentless bioprosthesis (Freestyle) for the patients of aortic valve stenosis (AS) with poor cardiac function. The purpose of this study is to clarify the usefulness of the stentless bioprosthesis for the patients with low ejection fraction (EF).

Method: Between 1999 and 2010, 48 patients of AS 65 years of age or older are undertaken aortic valve replacement (AVR) with Freestyle in our hospital. In 5 patients, the ascending aorta was replaced. MAZE procedure was required in 3 patients. We investigate midterm clinical outcome of these 48 patients divided into two groups, 10 patients with low EF (EF<55%, group A) and the other 38 patients (EF >=55%, group B). The group A was larger left ventricular diastolic and systolic diameters (LVDd/Ds=47.0/34.1 vs 40.8/24.5) and left ventricular mass index (LVMI=158.5g/m2 vs 121.3g/m2). The peak velocity across the aortic valve was slower (4.5m/s vs 5.0m/s) and the peak pressure gradient across the aortic valve was lower in the group A (80.0mmHg vs 102.4mmHg). The group A was considered to be more severe AS.

Result: Between two groups, there was no difference in the incidence of cardiovascular events, survival rate, and the regression of LVMI at late follow-up period. There was no significant change of EF in the group B (from 67.6% to 66.8%) 5 years after the operation, but there was marked improvement of EF in the group A (from 45.4% to 65.6%).

Conclusions: In the low EF group, the stentless valve can improve EF at late follow-up period. The stentless valve is considered to be effective for patients with aortic valve stenosis associated with poor left ventricular function.

P14-12

ROTATION OF THE BIOPROSTHESIS STENT POST FOR AORTIC VALVE REPLACEMENT (AVR) ACCORDING TO THE LOCATION OF CORONARY ORIFICES TO AVOID CORONARY TROUBLES

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Purpose

Although the Carpentier-Edwards PERIMOUNT Magna (CEPM) valve is used for AVR in patients with extremely small aortic root, obstruction of coronary orifices by the stent post or sewing cuff has been reported in some cases. To avoid the development of coronary trouble in patients with small aortic root, we examined the locations of the coronary orifices to suggest the method for AVR in high-risk patients.

Methods

Coronary orifices were identified in 102 consecutive cases by using electrocardiogram-gated 64-column multidetector-row computed tomography (MDCT). The locations of the coronary orifices were plotted on a scatter plot in which the distance between the valve annulus and sinotubular junction (STJ) was equally divided into 10 parts and the distance between commissures was equally divided into 20. In addition, we examined the positional relationship between the coronary orifices and the stent post or sewing cuff.

Results

Left coronary artery orifices were located lower than the STJ in 90 cases (89%), and right coronary artery orifices were located lower than the STJ in 85 cases (83%). Nine cases (8.8%) were associated with the risk of coronary problems: a coronary orifice was found near the commissure in 8 cases (7.8%) and low takeoff was observed in 2 cases (2.0%). For AVR, one-stitch rotation of the stent post was used for the near-commissure cases and intraannular implantation was used for the low takeoff cases. All cases did not cause coronary or other problems.

Conclusion

Rotation of the stent post or intraannular implantation was performed in 8.8% of the cases of AVR using the CEPM valve. Preoperative identification of the coronary orifices by using MDCT could predict possible subsequent coronary problems after CEPM valve implantation in patients with small aortic roots. Contrivances such as one-stitch rotation or intraannular implantation were required in the above cases.

P15-1

A CASE OF THE SUPERIOR VENA CAVA SYNDROME CAUSED BY RUPTURED BRACHIOCEPHALIC ARTERY

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[OBJECTIVE]

Commonest cause of superior vena cava syndrome is a malignant tumor.

We experienced a rare case of SVC syndrome attributed to the hematoma of the ruptured brachiocephalic artery aneurysm.

[METHODS]

An 84-year-old man was transferred to the emergency department with shock vital. His head, neck, and bilateral upper extremities were swollen, with respiratory distress.

Enhanced CT revealed a ruptured brachiocephalic artery aneurysm of 9cm in diameter, resulting in a massive hematoma in the mediastinum, which compress and obstruct the SVC.

Open repair with removal of hematoma was considered the treatment of choice to relieve the symptoms related to the SVC obstruction, however, his multiple comorbidities prompted us more palliative, endovascular approach.

Stent graft was deployed from the brachiocephalic artery to the right common carotid artery, and the proximal right subclavian artery was embolized with coils.

[RESULTS]

Even after the operation, the edema of the upper body did not resolved promptly.

It took 5 days for the swollen neck and possible tracheal compression to be resolved, before the patient was extubated.

Once the dropsy gradually subsided, the recovery was uneventful, with duration of ICU stay and hospital stay of 11 days and 24days, respectively.

[CONCLUSIONS]

Because the patient's comorbidities precluded the open repair, hematoma was not removed by the operation.

Therefore the symptoms related to the SVC syndrome remained, resulting in a long intubation period. Prudent postoperative management was required.

P15-2

GIANT EXTERNAL ILIAC ARTERY PSEUDOANEURYSM FOLLOWING PERCUTANEOUS CORONARY INTERVENTION : A RARE CASE

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Objective: Invasive cardiac interventions have important role in development of lower extremity arterial pseudoaneurysms.

Methods:A 27-year-old male presented with the complaint of difficulty in walking following the discharge from the hospital after percutaneous transluminal coronary angioplasty and stent implantation for acute myocardial infarction in a cardiology clinic. Arterial Doppler ultrasonography showed a 90x50 mm of pseudoaneurysm in right external iliac artery. Closure of aneurysm by compression and thrombin injection under ultrasonographic guidance was planned, which failed. A surgical intervention was scheduled. Aorto-femoral by-pass was performed with a 6-mm polytetrafluoroethylene graft.

Results: Postoperative course was uneventful and patient was discharged on the eighth day without any complication.

Conclusion: Although endovascular techniques and procedures including compression and thrombin injection under ultrasonographic guidance which failed in our patient, are used in treatment of pseudoaneurysms, conventional surgical approach is still the best. The primary procedure in surgical approach should be aneurysmectomy and arterial reconstructive intervention. End-to-end anastomosis or primary repair with an appropriate graft should be chosen.

P15-3

EXTRACRANIAL INTERNAL CAROTID ARTERY STENOSIS ASSOCIATED WITH INTERNAL CAROTID ARTERY ANEURYSM: FIRST CASE IN THE LITERATURE

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Objective: Extracranial internal carotid artery aneurysms are rare, but can lead to life-threatening complications. Usually, a pulsatile mass in the neck can be detected on physical examination but in some cases they are asymptomatic and only identified with the help of further investigations.

Methods: In this case report we present a patient admitted with complaints of head and neck pain and obscuration of vision who also had a history of peripheral arterial disease. Carotid angiography showed stenosis of the internal carotid artery and aneurysm of the internal carotid artery after the beginning of the carotid bulb.

Results: The patient was operated under general anesthesia. Following aneurismectomy and endarterectomy, the artery was closed with saphenous vein patchplasty. Patient was discharged on the fifth day without any complication.

Conclusions: An important feature of our patient was the concurrence of an internal carotid artery stenosis and a saccular aneurysm. A review of the literature did not retrieve any report of concurrence of an arterial aneurysm and an internal carotid artery stenosis. However, intracranial carotid artery aneurysms and extracranial internal carotid artery stenoses in different localizations were published in the literature.

P15-4

A CASE OF INFERIOR MESENTERIC ARTERY ANEURYSM IN ASSOCIATION WITH ARTERIOSCLEROSIS OBLITERANCE

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Inferior mesenteric artery aneurysm (IMAA) is a rare disease in visceral aneurysms. We experienced an open repair of IMAA in association with arteriosclerosis obliterance (ASO). The case was 74-year-old man who had progressive intermittent claudication for 10 years. Preoperative enhanced CT demonstrated IMAA and ASO due to the occlusion of right common iliac artery, the coil embolization was initially considered for his therapeutic option. However, CT also revealed the occlusion of superior mesenteric artery, the open repair of aneurismal resection and subsequent IMA reconstruction was performed in order to avoid mesenteric necrosis. During the procedure, we confirmed bilateral arterial flow of lower extremities and the good color of small intestine before abdomen was closed. The patient was started on food intake on postoperative day (POD) 3, and CT showed intact arterial flow of the inferior mesentery. Postoperative course was uneventful and the patient was discharged on POD 16.

P15-5

EMERGENT SALVAGE CARDIOVASCULAR SURGERY AFTER CATHETER INTERVENTION: RARE AND IMPRESSIVE 2 CASE REPORTS

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OBJECTIVE

Surgical back up is really important for trouble shooting in interventional catheter procedure for cardiovascular diseases. We herein present 2 case reports of emergent salvage operations.

METHODS

<Case 1>
A 42 year-old woman diagnosed as having atrial septal defect ostium-secondum-type which was 17.7×19.3mm in size without an aortic rim and a superior rim presented short of breath on effort. Right ventricule was dilated and Qp/Qs was 2.6. Therefore she was indicated for closure of ASD with an umbrella device.
During the procedure, she developed hypotension due to cardiac tamponade. Even after pericardial drainage, persistent bleeding was observed. Emergent surgery was carried out, and a tiny hole was comfirmed at the top of the left atrium. The hole was closed successfully and the ASD was also closed using cardiopulmonary bypass. It was speculated that the delivery sheath or the device itself made the tear during the procedure. She was discharged home uneventfully 12th postoperative day.
<Case 2>
A 44-year-old woman who received chemoradiotherapy including bevacizumab for the skipped esophageal metastasis of progressed gastric cancer presented vomiting a large amount of blood with hemorrhagic shock. CT demonstrated that there was a ruptured pseudoaneurysm in the descending thoracic aorta, penetrating to the esophagus. Initially thoracic endovascular aneurysm repair using a TAG endoprosthesis was performed as a salvage procedure, and she resolved well.
In the following open surgery for fistula, the aortoplasty with a pericardial patch was initially planned, but eventually a tube graft replacement was required because the endoprosthesis was coming out from the fistula, and massive bleeding occurred. The postoperative course was stable, and following esophagectomy was performed uneventfully.

RESULTS

There are no specific results in this case reports.

CONCLUSIONS

Emergent salvage cardiovascular operations were performed successfully in 2 cases.

P15-6

GIANT LEFT ATRIAL MYXOMA IN A 20-YEAR OLD PRESENTING WITH PALPITATIONS AND NEAR-SYNCOPAL EPISODES: A CASE REPORT

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A young 20-year old boy presented with palpitations, dyspnea and near-syncopal episodes. Findings of trans-thoracic echocardiography (TTE) were suggestive of a giant left atrial (LA) myxoma causing obstruction of diastolic inflow from mitral valve. The left atrial myxoma was found to be very large approximately 6cms by 5cms by 4cms, which was fully excised by open heart surgery. Post-operative stay was unremarkable and patient remained well on follow-up.

P15-7

A RARE GIANT RIGHT ATRIAL MYXOMA ARISING FROM CRISTA TERMINALIS

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A case of giant right atrial myxoma arising from the crista terminalis in a 32-year-old woman with a history of palpitation and dyspnea on great exersion. There was a discrepancy between a large right atrial mass and less intensity of signs. Our patient underwent surgical treatment with excision in bloc with safety margin of atrial wall, and the right atrial wall was repaired by autologus pericardium after tricuspid valve repair by DEVEGA technique.

Keywords: myxoma ; right atrium; crista terminalis

P15-8

RESECTION OF RENAL CELL CARCINOMA COMPLICATED BY INFERIOR VENA CAVA TUMOR PROGRESSION, WITH AN AID OF SELECTIVE COUNTERSIDE RENAL VEIN DRAINAGE TECHNIQUE

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[OBJECTIVE]We have examined the cases with renal cell carcinoma with tumor progression into inferior vena cava, and underwent total resection of the tumor while performing the selectively blood drainage from renal vein of non resected side through a cardiopulmonary bypass. [METHODS]We identified 6 patients with a median age of 56 years, who underwent radical surgical treatment for renal cell carcinoma under cardiopulmonary bypass, and tumor thrombus of the inferior vena cava between 2004 and 2011. 2 patients was graft replacement, 4 patients tumor extirpation with excision and suture of inferior vena cava. [RESULTS]In previous cases we underwent intermittent blocking of renal vein, renal dysfunction was occasionally observed. However, after we have implemented a sustained renal blood drainage using a cardiopulmonary bypass, and the postoperative renal function passed satisfactory with the subsequent cases now. [CONCLUSIONS]Not only total resection of renal cell carcinoma with inferior vena cava tumor progression, but selective renal vein drainage procedures has been suggested to be useful. Here we report points devised in surgical operations in addition to the consideration.

P15-9

SURGICAL EXPERIENCE OF PRIMARY CARDIAC TUMORS

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OBJECTIVES:

Primary cardiac tumors are rare and its diagnosis is difficult because of asymptomatic. We reviewed our 4 year-experience with a primary cardiac tumor cases.

METHODS:

The patient database at Saiseikai Tobu Hospital was investigated twelve patients with primary cardiac tumors between 2004 and 2008. Eight were myxomas (mean age of 58.4 ± 12.4), and 2 were malignant primary cardiac liposarcomas (mean age of 63.5 ± 7.78). One was papillary fibroelastoma and the other was hemangioma. Complete resection of the tumors was achieved performed in all cases except in two liposarcomas.

In 8 myxoma patients, 4 patients were asymptomatic, but followed up by other symptoms in hospital such as hypertension, anemia, liver dysfunction or sleep apnea syndrome. Two had symptoms of cerebral infarction and one had shortness of breath and palpitation, respectively.

In 2 liposarcoma patients, one suffered from shortness of breath and the other was asymptomatic, who had been followed up for postoperative gastric cancer. Patient with papillary fibroelastoma had dizziness and patient with hemangioma was asymptomatic, who was followed up for postoperative rectal cancer.

RESULTS:

In-hospital mortality was 0% in eight myxomas, fibroelastoma and hemangioma patients. On the other hand, one of two patients with liposarcoma was dead 39 days postoperatively during hospitalization. All the tumors except two liposarcomas were resected completely under cardiopulmonary bypass. So far, no recurrence of tumor has occurred regarding myxoma, hemangioma and fibroelastoma.

CONCLUSIONS:

Primary cardiac tumors of 12 cases in our hospital were surgically treated with good short-term results. Mortality of malignant liposarcoma was still high. A meticulous follow-up is mandatory in order to detect the recurrence, which is rare but actually reported.

P15-10

GOOD RESULTS AFTER REMOVE CHRONIC EXPANDING HEMATOMA

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[OBJECTIVE]Chronic expanding hematoma(CEH) begins to expand chronically more than 1 month after bleeding such as surgery or trauma. CEH occurs at various locations for example, in the thoracic cavity or muscles, though rarely in the pericardial cavity. The mechanism of CEH is not still elucidated. The objective of this study is that it is useful to treat CEH in the pericardial cavity for heart failure.

[METHODS]cases reports.

[RESULTS]We report two cases of heart failure due to CEH. We operated them to remove CEH and performed pericardiotomy at the same time. «Case 1» A-64-year-old male, who had a history of coronary artery bypass grafting 18 years previously, was referred to our hospital for general fatigue. Computed tomography (CT) illustrated severe compression of the left ventricle by a large mass surrounded calcified epicardium. We diagnosed him intrapericardial CHE which brought about heart failure. We operated him through median re-strenotomy, removing CEH and pericardiotomy. After surgery, heart failure diminished, no pericardial effusion appeared one year later. «Case 2» A-72-year old female, who had no history of cardiac surgery or trauma or lung diseases, was referred to our hospital for dyspnea on effort. CT revealed large mass compressed the right ventricle. She was diagnosed with right heart failure due to CEH. We operated her through median sternotomy to remove CEH and to perform a waffle procedure of adhered epicardium. Following surgery, her symptoms gradually improved. No recurrence showed after three months. [CONCLUSIONS]CEH in the pericardial cavity probably causes heart failure. Surgery to remove CEH and pericardiotomy improved the symptoms of heart failure.[Key words] chronic expanding hematoma, heart failure

P16-1

TRANSCATHETER AORTIC VALVE IMPLANTATION VERSUS SURGICAL AORTIC VALVE REPLACEMENT FOR AORTIC VALVE STENOSIS: A META-ANALYSIS OF COMPARATIVE STUDIES

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Objectives: This study sought to perform a meta-analysis to investigate the clinical outcomes following transcatheter aortic valve implantation (TAVI) and surgical aortic valve implantation (SAVR) in published comparative studies.

Background: It is not known whether there are differences in clinical outcomes between the two most commonly used method to treat the aortic stenosis: SAVR and TAVI.

Methods: A meta-analysis of data on comparative studies which underwent TAVI and SAVR was conducted using predefined criteria. Bayesian meta-analytic methods were employed.

Results: One randomized controlled trials and eighteen retrospective comparative studies including 5865 patients met inclusion criteria and were included in the analysis. SAVR patients were associated with a better 30-day mortality (OR=1.52, 95%confident interval [CI]: 1.20-1.92, P=0.0005), a less vascular complication (OR=2.08, 95%CI 1.48-2.93, P<0.00001) and a less para-valvular leakage (OR=11.84, 95%CI 5.31-26.39, P<0.00001).

Conclusions: TAVI has a long way to go. TAVI cannot offer better 30-day mortality and fewer complications. Future well-designed RCTs are needed to confirm and update the findings of this analysis.

Key words: meta-analysis; comparative studies; transcatheter aortic valve implantation; surgical aortic valve replacement; TAVI; SAVR; clinical outcomes

P16-2

TRANSCATHETER AORTIC VALVE IMPLANTATION IN A PATIENT WITH SEVERE AORTIC INSUFFICIENCY AND MINIMAL AORTIC ANNULAR CALCIFICATION

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Severe aortic insufficiency with minimal aortic annular calcification has been considered a relative contraindication to transcatheter aortic valve implantation (TAVI) because of a lack of calcium for fluoroscopic visualization and radial stent fixation. We report a patient with severe aortic insufficiency after previous coronary artery bypass and aortic valve repair who underwent successful TAVI. The patient was a 62-year-old male who had previously undergone a three-vessel coronary artery bypass and attempted aortic valve repair 5 years earlier. At that time, the aortic valve was moderately insufficient. An aortic valve repair was performed by closing the sub-commissural triangles with 3 separate pledgetted mattress sutures. Over the subsequent years, the patient developed progressive dyspnea on exertion (NYHA class III). Cardiac catheterization confirmed severe AI and patency of 3 previous grafts. Conventional re-operation was considered; however, the consensus of the TAVI team was that TAVI would minimize the periprocedural risks with the most potential for a good outcome.

Intraoperative transesophageal echocardiography was critical to guide valve implantation and previous surgical pledgets were utilized to seat an oversized TAVI prosthesis within the aortic annulus. In early follow-up, the patient remained NYHA class I and echocardiography demonstrated a well-functioning TAVI prosthesis with no aortic insufficiency.

P16-3

LONG TERM CLINICAL EXPERIENCE WITH THE BENTALL PROCEDURE

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Objectives: The aim of study is topresent the early and long term clinical outcomes of our 31- year experience with Bentall operation, and to compare the coronary reimplanatation techniques for identifying the fate of coronary ostial anastomosis.

Methods: Between April 1981 and April 2012, 158 patients (mean age 45.6±14.6 years) underwent the Bentall operation using composite valved conduit. Preoperative diagnosis included annuloectasia(99), acute and chronic aortic dissection(47), prosthetic valve failure(5), root pseudoaneurysm(3), and endocarditis(1). There were 50 patients with Marfan syndrome. The operative procedures were button reimplantation technique in 101 patients and Cabrol modification in 57 patients.

Results: The early mortality and late death occurred in 5(3.2%) and 16(10.1%) patients, respectively. The mean follow up duration was 112.9months. 15 patients required reoperation due to anastomosis site leakage, progression of Behcet disease, endocarditis, and prosthetic valve failure, which were related to Bentall procedure. Moreover, 18 patients underwent thereoperation for various types ofremained aortic disease. Total 39 patients who underwent Cabrol technique performed CT angiogram during follow up periods.20 of them showed coronary graft problems and most of problems occurred in right coronary conduit while 6 of 45 patients who underwent Button reimplantation procedure showed minor coronary problems. In propensity score analylsis, coronary artery problems significantly increased in patients who underwent Cabrol technique (OR=5.5, 95%CI [1.6, 19.2], p=0.0069).Kaplan-Meier estimated survival rates at 1,5,10,20,30 years were 94.9%,89.5%,88.5%,80.7%,69.3%, respectively.

P16-4

MID-TERM OUTCOMES OF AORTIC ROOT REIMPLANTATION IN EXPANDED CLINICAL BACKGROUND: A SINGLE CENTER EXPERIENCE IN 155 PATIENTS

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Objective: The aim of this study is to examine the results of the David type valve-sparing operation in expanded, challenging clinical scenarios such as Marfan syndrome, emergent type A aortic dissection and the elderly.

Methods: From 2000 to 2012, 155 David type valve-sparing aortic root replacements (DVS) with and without cusp repair were performed in our group by a single surgeon. A total of 67 patients (43.2%) had undergone the DVS in challenging clinical settings (challenging group) including Marfan syndrome (n=35), emergent type A dissection (n=25) and 70 years or older (n=31). These patients were compared with a group of remaining 88 patients (control group) aged under 70 without connective tissue disorders, who underwent a DVS in a elective setting. Concomitant cusp repair was performed in 21 (31.3%) in challenging group and 63 (71.6%) in control group ($p<0.0001$). More bicuspid valves were included in the control group (32 in control group versus 1 in challenging group, $p<0.0001$).

Results: There were 2 in-hospital deaths (1.3%); the one in the challenging group had a multi-organ failure after salvage operation for acute type A dissection and the other in the control group had a cranial hemorrhage 2 weeks after elective surgery. The overall survival at 5 years was 97.5 %; 96.3% in challenging group and 98.9% in control group ($p=0.97$). Thirteen patients required aortic valve replacement: 10 for recurrent AR and 3 for endocarditis or graft infection. Freedom from re-operation in challenging group and control group was 90.9% and 91.6%, respectively ($p=0.86$). No difference was observed in the freedom from moderate AR between the groups (83.5% in challenging group versus 90.0% in control group, $p=0.67$).

Conclusions: Early and mid-term results of DVS performed for the expanded indications were satisfactory in terms of both survival and valve function.

P16-5

EARLY AND MID-TERM RESULTS OF TRICUSPID ANNULOPLASTY WITH THE INTEGRATED STRATEGY FOR USING 3-DIMENSIONAL RIGID RING AND FLEXIBLE BAND

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OBJECTIVE: We employ the strategy for choosing between 3D rigid ring and flexible band depending on the Tricuspid regurgitation severity. The aim of this study was to evaluate the early and mid-term results of our strategy for TR.

METHODS: From May 2008 to December 2011, 115 patients underwent tricuspid annuloplasty (TAP) (mean age, 65.9±12.1 years; 65 males). Preoperative TR grade in echocardiography was as follows; mild 43 (37%), mild-to-moderate 33 (29%), moderate 21 (18%), moderate-to-severe 8 (7%), severe 10 (9%). Our strategy for TR was as below: (1) 3D rigid ring (Edwards MC3 annuloplasty ring) was used for moderate and severe TR. (2) Less than moderate TR was aggressively treated with flexible band (St. Jude Medical Tailor Flexible Band). (3) In the size selection, 28mm (rigid) or 29mm (flexible) were selected in cases of more than 1.5 m2 in body surface area (BSA), 26mm (rigid) and 27mm (flexible) were selected in cases of less than 1.5m2 in BSA. Echocardiography was done at discharge and follow-up (the mean follow-up was 14.3±9.3 (0-36.9) months).

RESULTS: At discharge, 2 patients (1.7%) had residual moderate TR. In 98% of patients, TR was controlled under mild-to-moderate. At follow-up, 6 cases (8%) had more than moderate TR (5 cases were rigid ring group). No one had postoperative tricuspid stenosis. Univariate analysis showed that left atrium diameter (p=0.002), preoperative TR severity (p=0.001), postoperative mitral regurgitation (MR) severity (p<0.001) were associated with the residual more than moderate TR at last follow-up visit. In multivariate logistic regression analysis, postoperative residual MR severity was the independent predictor of late TR (p=0.014, odds ratio 3.982, 95% CI 1.3-12.0).

CONCLUSIONS: Our aggressive strategy using flexible band for less than moderate TR with ring size selection depending on the BSA is effective with durability.

P16-6

TRICUSPID ANNULOPLASTY FOR FUNCTIONAL TRICUSPID REGURGITATION USING FLEXIBLE BAND

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OBJECTIVE. The various types of tricuspid annuloplasty (TAP) rings are used for functional tricuspid regurgitation (TR). The flexible band has been developed to permit physiologic motion of the tricuspid annulus. The aim of this study is to analyze our experiences of tricuspid annuloplasty using flexible band.

METHODS. Between 2004 and 2011, 57 consecutive patients (68 ± 11 years) underwent tricuspid annuloplasty using the Cosgrove-Edwards flexible band (Cosgrove group: n = 35) or Tailor flexible ring (Tailor group: n = 22) for functional TR (TR grade >=2). Fifty-three patients (93.0%) underwent mitral valve surgery. In the Cosgrove group, it was implanted on the annulus from the anteroseptal to the septoposterior commissure. In patients with Tailor groups, it was implanted on the annulus from the anteroseptal commissure to the middle of the septum. We compared the TR recurrence during the mid-term follow-up period (25 months).

RESULTS. There were 2 (3.5%) hospital deaths. After 1 month, 72% and 95% of patients showed grade 0 to grade 1+ in the Cosgrove group and the Tailor group, respectively (P = 0.054). At follow-up, there were no significant difference between two groups in survival and hospitalization due to heart failure. Freedom from recurrent TR (TR grade >=2) in Cosgrove group and Tailor group was 84.6% vs. 100% at 6 months, 73.1% vs. 90.0% at 12 months and 65.0% vs. 90.0% at 18 months, respectively (P = 0.036).

CONCLUSIONS. In patients undergoing tricuspid annuloplasty, the shape of the artificial ring, in which coverage of the septal annulus, might be an important factor for regulating TR recurrence.

P16-7

LIBMAN-SACKS ENDOCARDITIS IN A PATIENT WITH SYSTEMIC LUPUS ERYTHEMATOSUS AND ANTIPHOSPHOLIPID ANTIBODIES AND ITS SUCCESSFUL TREATMENT WITH MITRAL VALVE REPLACEMENT: A CASE REPORT

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Libman-Sacks endocarditis was first discovered by Emanuel Libman and Benjamin Sacks in 1924. Although it is not the most common cardiac manifestation of Systemic Lupus Erythematosus (SLE), it is the most characteristic one. Among the four valves, mitral valve is the most commonly affected. Some studies have shown the relationship between Libman Sacks endocarditis and antiphospholipid antibodies. Valvular involvement has been shown to be greater in people with SLE and antiphospholipid antibodies.

Here we report a case of a 34 year old woman with antiphospholipid antibody syndrome and SLE who presented with mitral valve regurgitation. The patient was taken for surgery and the mitral valve replaced successfully with a prosthetic valve with no follow-up complications.

We believe and suggest that mechanical valve replacement should be employed regularly in the management of mitral regurgitation in Libman Sacks endocarditis in view of the recent medical literature and our own case report.

P16-8

SUCCESSFUL TRICUSPID VALVECTOMY IN A SEPTIC PATIENT WITH TRICUSPID VALVE ENDOCARDITIS: A CASE REPORT

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Endocarditis is characterized by a prototypic lesion known as a vegetation, which is a mass of platelets, Fibrin, micro colonies of microorganisms, and inf lammatory cells. Over the past three decades, the incidence of right-sided endocarditis has risen dramatically.

We describe a case of a 36-year old woman with a history of repeated IV analgesic injections for low back pain, who presented with high grade fever and sepsis and a WBC count of 44,000 with 90% neutrophils. Echocardiography showed large mobile vegetations on tricuspid valve.

Tricuspid Valve Endocarditis (TVE) is generally responsive to medical treatment however, about 25% of TVE patients require surgical intervention. Long-term survival of a patient without a TV is possible, particularly if there is normal PA pressure. Subsequently, up to 25% of these patients are not able to tolerate the tricuspid regurgitation (TR) and require a replacement.

P16-9

CORRECTION OF TRICUSPID VALVE DISEASE IN RE-DO OPERATIONS ON HEART VALVES

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Aim of research to learn peculiarities surgical treatment severe tricuspid regurgitation in re-do operations on heart valves.

Materials and methods. In multicentral research in which participated 3 clinics 51 patients underwent tricuspid valves procedures in re-do operations on heart valves. Mean age of patients was 53±8 (35-72) years. The main etiologic factor for development heart valve disease was rheumatic process on heart valves: 48 (94 %) patients. All patients had previous tricuspid valve repair before this hospitalization. Among these: 30 patients underwent De-Vega annuloplasty, 19 bicuspidulization, 1 repair of anterior leaflet, 1 comissurotomy.

The mean length of time between two tricuspid operations was 6,5±3 years ($p<0,001$).

Results: Both dilatation of tricuspid valve annulus and failed previous tricuspid valve procedure (cutting out of suture annuloplasty) are main causes of recurrent severe tricuspid regurgitation, which we observed in 37,3 % and 54% cases respectively.

Thirty nine patients underwent annuloplasty ring, 2 underwent Batista's annuloplasty, 10 underwent tricuspid valve replacement.

Postoperative death was 3%. Complications of postoperative period had nonspecific character. A transthoracic echocardiography was performed in all patients at discharge and showed reduction of measurements both right atrium and right ventricle, decrease pulmonary artery systolic pressure.

Conclusion. Tricuspid valve repair is an effective procedure in redo operations on heart valves. Both dilatation of tricuspid valve annulus and failed previous tricuspid valve procedure (cutting out of suture annuloplasty) are main causes of recurrent severe tricuspid regurgitation. In cases with recurrent severe tricuspid regurgitation more preferable ring annuloplasty. Tricuspid valve replacement is an exceptional procedure which has to perform in cases with rude changes on tricuspid valve.

P16-10

OUR TECHNICAL MODIFICATION OF AORTIC VALVE SPARING OPERATION FOCUSED ON STANDARDIZATION AND REPRODUCIBILITY

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Background : The aortic valve-sparing operation has been accepted as an ideal procedure for the treatment of aortic root aneurysm, especially in young patients. However, this operation is thought to be technically difficult due to lack of conceptual understanding of the procedure for many surgeons. In order to overcome the surgical problem, we have developed a simple valve-sparing aortic root replacement focused on standardization and reproducibility.

Methods : Eleven consecutive patients underwent the aortic valve-sparing operation in our institution. Our surgical strategy to restore valvular competency is based on the concept of inserting a dilated aortic annulus into small sized graft. Regardless of annular diameter, the Valvalva Graft of 26 mm was used in all patients. Proximal end of the graft is secured on the outside of the left ventricular outflow tract with 12 mattress sutures. The three commissures are suspended upward inside the graft as possible. The remnants of aortic sinuses are sutured to the graft in U-shaped using continuous suture line. If necessary, aortic cusp repair was performed. Coronary arteries are reconstructed by Piehler's method.

Results : There was no operative death. Valve-sparing procedure was completed without conversion to valve replacement and no significant postoperative aortic insufficiency was noted.

Conclusions : The excellent outcome was demonstrated with our simple modification. Although we recommend this technique of the aortic valve-sparing procedure which could make it reproducible and technically less demanding, close observation would be mandatory concerning with valvular durability in this particular circumstance.

P16-11

THE ROSS PROCEDURE IN PATIENTS WITH AORTIC VALVE DISEASE AND CONCOMITANT ASCENDING AORTA DILATATION

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Objective: To evaluate results of the Ross procedure in patients with aortic valve disease and aneurysm or dilatation of the ascending aorta.

Methods: Between 2003 and November 2012, 95 Ross procedures were performed in patients with aortic valve disease and concomitant ascending aorta dilatation (size of the root or ascending aorta more than 45 mm). The mean diameter of the sinuses of Valsalva was 44,7 ± 10,9 mm, ascending aorta 51,4 ± 8,3 mm. The total root replacement technique was applied in all patients. In the majority of cases (75 patients) we performed resection of dilated part of ascending aorta and replacement by pulmonary autograft. Sixteen patients underwent concomitant reduction aortoplasty. In two cases the Ross procedure was combined with replacement of the ascending aorta by vascular dacron graft and in two cases - by xenopericardial patch. For right ventricular outflow tract reconstruction cryopreserved pulmonary homograft was used in 19 patients and stentless xenograft was used in 76 patients.

Results: Hospital mortality rate was 3,15% (three patients). Mean follow up 18,2 months. There was one late death. At follow-up freedom from moderate and severe autograft valve insufficiency was 87%. Three patients underwent autograft valve replacement in early postoperative period due to significant insufficiency. During follow-up no recurrent ascending aortic dilatation were observed. Minimal peak RVOT gradient was obtained by using cryopreserved pulmonary homograft.

Conclusions: The Ross procedure in combination with reconstructive operations on the ascending aorta shows good results in patients with aortic valve disease and concomitant ascending aorta dilatation.

P17-1

CONGENITAL TRICUSPID VALVE CLEFT MIMICKING EBSTEIN ANOMALY

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Backgound and Objective: Congenital tricuspid valve cleft is rare. We reported our 1 interesting case of this disease presented with easy fatigueability and giant worm-like neck vein engorgement. This patient was sent to us with the diagnosis of Ebstien's anomaly.

OBJECTIVES AND BACKGROUND:

Severe primary tricuspid regurgitation in the adult is a rare finding. This study describes the diagnostic findings and the treatment of an isolated congenital cleft of the anterior leaflet of the tricuspid valve as the morphologic substrate for severe tricuspid regurgitation.

METHODS:

The clinical, echocardiographic findings and the follow-up findings of this 26 years old male patient is described. He underwent cardiac surgery that confirmed the diagnosis.

RESULTS:

In this patient, exertional fatigue was the limiting symptom (New York Heart Association functional classes II and III). The clinical findings included a holosystolic murmur and supraventricular arrhythmia. Intraoperative transesophageal echocardiogram was performed and confirmed that Ebstein's anomaly was excluded. The operation was done successfully by reconstruction of the tricuspid valve with reapproximate the cleft between anterior and posterior leaflet and then tricuspid valve annuloplasty was added using classic ring no.34 from Edwards company and partial excision of the right atrium and closure of a coexisting atrial septal defect.

CONCLUSIONS:

Tricuspid valve anomalies can usually be accurately identified by Doppler echocardiography. Surgical repair is the treatment of choice in patients with severe tricuspid regurgitation due to a congenital cleft of the anterior leaflet of the tricuspid valve with excellent outcome.

P17-2

THE EARLY AND MIDTERM RESULTS OF MODIFIED HETZER OPERATION IN EBSTEIN'S ANOMALY THE REPORT OF FOUR CASES

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Object: Ebstein's anomaly has presented an ongoing challenge. A lot of techniques for tricuspid repair were reported. We experienced four cases of Ebstein's anomaly repaired by modified Hetzer method. We describe the modified operative technique and present the early and midterm results of four cases.

Patients and Methods: The patients were two female, aged 12 and 34 years and two male, aged 14 and 34 years. All but one had atrial septal defects. One patient (12 year-old- female) had paroxysmal ventricular tachycardia. Three patients were in New York Heart Association (NYHA) class II and one patient was in class IV. Tricuspid incompetence was grade III in one patient and grade IV in three. The tricuspid valve was repaired by modified Hetzer operation (posterior annulorrhaphy and partial plication of atrialized right ventricle). Tricuspid annuloplasty rings were used in three patients. All ASDs were closed and cryoablation was performed in one patient with paroxysmal ventricular tachycardia. Autologous pericardium augmentation of tricuspid septal leaflet using artificial chordae was performed in one patient (14 year-old-male).

Results: There were no hospital deaths and no late deaths. There were no cases of reoperation. The follow-up periods were 3 months, 3 years, 6 years and 9 years. At the last follow-up, all patients were in NYHA class I. Tricuspid incompetence was grade I in two patients, grade II in two patient.

Conclusion: The early and midterm results of modified Hetzer operation in Ebstein's anomaly are satisfactory. However the longevity of this repair remains to be determined.

P17-3

STAGED REPAIR FOR AORTIC ARCH RECONSTRUCTION AND INTRACARDIAC REPAIR FOLLOWING BILATERAL PULMONARY ARTERY BANDING IN THREE CRITICAL PATIENTS

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Bilateral pulmonary artery banding (PAB) has been performed as a first palliation for hypoplasctic left heart syndrome with a poor preoperative condition. We report three patients with aortic arch reconstruction and intracardiac repair following bilateral pulmonary artery banding in moribund patient after birth. The patient in case 1 underwent bilateral PAB at 18 days old, then biventricular repair was performed 58 days old. In case 2, the patient underwent bilateral PAB at 10 days old, then biventricular repair was performed 91 days old. The patient in case 3 underwent bilateral PAB at 19 days old, then biventricular repair was performed 107 days old. Our patients successfully received arch reconstruction and intracardiac repair at the age of 2 or 3 months after birth with a body weight of 3.5 kg and 4.5 kg, respectively. Because all patient did not require plasty of the bilateral pulmonary arteries, this might be an appropriate age for repair.

P17-4

SURGICAL REPAIR FOR DOUBLE OUTLET RIGHT VENTRICLE WITH INTACT VENTRICULAR SEPTUM

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Introduction: Double outlet right ventricle with intact ventricular septum is extremely rare and there were only 2 patients so far have been reported as successfully treated by a bidirectional cavopulmonary shunt in DORV with intact ventricular septum. We report the case of a neonate with a very rare complex cardiac anomaly that consisted of a double outlet right ventricle (DORV), intact ventricular septum, small left ventricle, pulmonary stenosis and small left ventriculo-coronary communications.

Material and Method: A 16-day-old male neonate who underwent successfully first palliative operation with a modified right Blalock-Taussig shunt using a 3.5-mm-diameter polythetrafluoroethylene graft, creation of ventricular septal defect and atrial septectomy on cardiopulmonary bypass. At five months of age, the patient underwent staged bidirectional cavopulmonary anastomosis, concomitantly enlargement of ventricular septal defect and repair of left pulmonary venous stenosis.

Results: There was no arrhythmia. Postoperative echocardiography revealed fair right ventricular performance, a low pressure left ventricle (by Doppler evaluation of the left ventricle-left atrium regurgitation), and a low velocity left-to-right shunt through ventricular septal communication. The patient was discharged home after an uneventful postoperative course and has been waiting for total cavopulmonary conection.

Conclusions: This is the only case of surgically creation of ventricular septal defect with systemic to pulmonary shunt reported in the literature for this type of heart defect.

In our opinion this solution avoids leaving a small but highly hypertensive ventricle that may be possibly avoiding late complications such as arrhythmias, systemic ventricular dysfunction and developing the left ventriculo-coronary communications.

P17-5

REPAIR OF TOTAL ANOMALOUS PULMONARY VENOUS CONNECTION IN THE ERA OF NITRIC OXIDE

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OBJECTIVE: The aim of surgical repair in total anomalous pulmonary venous connection (TAPVC) is to establish an unobstructed communication between the pulmonary veins and the left atrium, interrupt the connections with the systemic venous circulation, and remove intracardiac shunting.

METHODS: Between December 2010 and November 2012, 26 patients with a mean age of 5.8 ± (range one month to 17 years) underwent repair of TAPVC. Twelve were male, 14 were female. Diagnoses were made by transthoracic echocardiography. Cardiac catheterization was performed in seven patients.

RESULTS: There were 11 patients with supracardiac type, 10 with cardiac type, two with infracardiac type, and three with mixed type TAPVC. Two patients had atrioventricular septal defect. Except the cardiac types all the operations were performed with total circulatory arrest. The vertical vein was left open in three patients. Atrial septal defect was left open in three patients. Mortality did not occur in the early and mid-term follow up periods. None of the patients experienced symptoms of pulmonary venous obstruction or stenosis.

CONCLUSION: TAPVC is still a challenging congenital cardiac anomaly in the era of nitric oxide. The pathology may be treated with acceptable results with appropriate surgical and postoperative care.

P17-6

EARLY AND MIDTERM OUTCOMES OF SUTURELESS TECHNIQUE FOR POSTOPERATIVE PULMONARY VENOUS STENOSIS

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Background: Sutureless in situ pericardium repair for the relief of pulmonary venous stenosis (PVS) after the repair of TAPVC is firstly reported by F. Lacour-Gayet in 1996. This technique has been popular because of its potential to avoid recurrent stenosis. However, detailed clinical advantages remain unclear. We retrospectively reviewed our surgical experience, and compared the outcome with that of conventional procedures.

Materials and methods: For the relief of post-operative PVS after TAPVC repair, 5 patients underwent a conventional procedure, such as orifice cutback or resection of a proliferated intima, from 1999 to 2004 (group C, 4 males, median 93-day old, 3.6 kg). Thereafter 7 patients with PVS were repaired with sutureless technique from 2005 to 2011 (group S, 5 males, 119-day old, 3.4 kg). Patients with single ventricle were excluded. There were no significant differences regarding patient's characteristics. Follow-up examinations were completed in all.

Results: The cumulative survival rates at 5 years in group C and S were 60% and 85.7%, respectively. Freedom from re-intervention for the pulmonary veins at 5 years in group C and S were 60% and 85.7%, respectively. The rate of re-stenosis after relief of PVS were 100% (10/10) in group C and 31.6% (6/19) in group S (p=0.0088). In bilateral venous stenosis patients, survival was 0% (0/2) in group C and 83.3% (6/7) in group S (p=0.035). Among 3 patients (one in group C and two in group S) who developed PVS in all four pulmonary veins, only one in group S survived.

Conclusions: PVS relief with sutureless technique was superior to conventional procedures particularly in more severe cases such as bilateral PVS or PVS in all four pulmonary veins. Sutureless technique for post-operative PVS could be applied aggressively even at the initial repair for TAPVC to decrease the risk of post-operative PVS.

P17-7

CANTRELL'S SYNDROME WITH COMPLEX CONGENITAL HEART DISEASE

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Objective:

Cantrell's syndrome is congenital defects including of supra-umbilical abdominal wall defect, a defect of the lower portion of sternum, a malformation of anterior diaphragm, deficiency of the diaphragmatic pericardium, and the congenital cardiac anomaly [1]. The most common cardiac anomaly is ventricular septal defect [2]. Combined complex congenital heart defect are very rare. It seems to be a major cause of mortality in this syndrome.

Method:

In recent one year, three patients with Cantrell's syndrome were diagnosed at our hospital. The cardiac anomalies of these three patients were all complex congenital heart diseases; two of them were double-outlet right ventricle and the other one was truncus arteriosus (type I) with ventricular septal defect. We reviewed the patient's history, surgical intervention and clinical outcomes.

Result:

Two patients with double-outlet right ventricle are alive at follow-up. They received total correction successfully. One patient with truncus arteriosus (type I) and ventricular septal defect received primary successful surgical intervention. But intensive care was terminated under the parent's request due to other severe associated malformation.

Conclusion:

In our experience, Cantrell's syndrome associated with complex congenital heart disease can undergo successful cardiac surgery and survive.

P17-8

HYBRID APPROACH FOR HLHS WITH DUCTAL CONSTRICTION

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Objective- To assess the efficacy of the hybrid approach which includes bilateral pulmonary arteries banding (BPAB) and patent ductus arteriosus (PDA) stent for hypoplastic left heart syndrome (HLHS) with ductal constriction.

Methods- The hybrid approach was performed in two HLHS cases that were failed to maintain ductal patency with prostaglandin E before or after initial surgery. In one case, ductal stenosis progressed after BPAB despite continuous administration of prostaglandin E, and then PDA stent was implanted through femoral vein. In the other case, ductal constriction diagnosed at birth, BPAB and PDA stent was performed simultaneously through a median sternotomy. PALMAZ^{R} Genesis^{TM} for the former and Express^{TM} LD for the latter were mounted respectively at catheter laboratory. Minimal ductal diameter and ductal flow velocity assessed on Doppler echocardiography before and after implantation of PDA stent.

Results- Both patients survived and their adequate ductal patency was achieved until Norwood procedure. Minimal ductal diameter was enlarged (the former: 4mm to 6.3mm, the latter: 3mm to 8mm), flow velocity decreased (the former: 2.4 m/s to 1.5 m/s, the latter: 2.4 m/s to 1.9 m/s). Although no morbidity associated with this procedure has been observed, neo-intimal thickening and tissue adhesion in the PDA and around stent including the descending aorta were seen.

Conclusions- While precise diagnosis and cooperative treatments are necessary by cardiology and surgical team, this hybrid approach could be promising option for HLHS especially with jeopardized ductal constriction.

P17-9

EXPERIENCE OF OK-432 FOR INTRACTABLE PLEURAL EFFUSION IN NEONATAL PATIENTS AFTER OPEN HEART SURGERY

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Objective: Intractable pleural effusion is a serious problem in neonatal patients after open heart surgery. Thoracic duct ligation is an invasive and unreliable surgical option. Therefore, we tried injecting OK-432 into the pleural cavity of these patients.

Methods: A retrospective chart review (2007 to 2012).

Results: OK-432 injection was performed in six patients. Patient characteristics were as follows: median age, 1.5 day (range 0-28); median weight, 2.9 kg (range 2.1-3.2); biventricular heart, two patients (infracardiac total anomalous pulmonary venous connection [TAPVC], and supracardiac TAPVC plus coarctation of the aorta); and univentricular heart, four patients (two patients have hypoplastic left heart syndrome [HLHS]; one, HLHS variant plus supracardiac TAPVC; one, corrected transposition of the great arteries plus hypoplastic right ventricle plus severe Ebstein's anomaly). Peak pleural drainage reached 105 ± 41 ml/kg/day. Chylothorax was diagnosed in five patients. Diuresis, MCT diet or total parenteral nutrition, Octreotide, and protein supplementation were universally ineffective. OK-432 (0.5-1 KE) was injected into the affected pleural cavity (three bilaterally and three unilaterally). Chest tube was declamped after postural changes. This was continued for several days. New chest tube(s) was inserted in three patients with insufficient drainage, however all chest tubes were removed 4-25 days after OK-432 injection. There was no mortality. Temporal deterioration of arterial blood gas and lung compliance occurred in two patients, and atrial tachyarrythmia in one. In patients with univentricular heart, three underwent Fontan completion.

Conclusions: OK-432 is effective and reliable for intractable pleural effusion in neonatal patients.

P18-1

RECONSTRUCTION OF TWO CORONARY SYSTEM BY "SPIRAL CUFF TECHNIQUE" IN ANOMALOUS LEFT CORONARY ARTERY FROM THE PULMONARY ARTERY

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Objective; We present a new technique for coronary transfer in the repair of an anomalous origin of the left coronary artery from the pulmonary artery when the direct transfer is not feasible. Methods; The coronary artery is elongated with the native pulmonary artery wall to form a spiral-shaped coronary cuff to construct un-stretched new left coronary artery system from the ascending aorta. A 2 months-old girl suffering from life-threatening heart failure admitted to our hospital. Preoperative echocardiography revealed anomalous origin of the left coronary artery from the pulmonary artery with poor collateral circulation from the right coronary artery. Severe mitral regurgitation due to necrosis of the anterior papillary muscle associated with malformation of subvalvular apparatus was also recognized. Because direct transfer of the coronary artery to the ascending aorta was not feasible, reconstruction of the coronary artery was performed using spiral cuff technique. As a concomitant procedure, mitral valve replacement with bileaflet mechanical prosthesis was performed. Results; Although the patient required postoperative circulatory support for 2 days, postoperative course afterwards was smooth, and the patient is doing well more than 5 year after the operation. Six patients underwent same procedure with maximum 10 years follow-up without operative death or late death. Conclusion; Reconstruction of the coronary system by spiral method is a good alternative when direct transfer is not feasible in anomalous origin of left coronary artery from the pulmonary artery.

P18-2

SURGICAL TREATMENT FOR CONGENITAL HEART DEFECT WITH CORONARY ARTERY ANOMALY

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Objective:
Anomalous aortic origin of the coronary artery with high take off is a rare condition in congenital heart defect and may lead to a high risk of operation.We report two success cases with complicated lesion.
Methods:
We analyzed two cases retrospectively.
Patient 1 was 10-month-old boy of Tetralogy of Fallot(TOF).Coronary angiography and three-dimentional reconstruction of computed tomography revealed the left anterior descending (LAD) coronary artery originating from the right sinus of valsalva, which was high take off and crossing the right ventricular outflow tract(RVOT) near by pulmonary valve annulus.The preoperative z-score of the pulmonary annulus was -3.0, and pulmonary valve had 3 commissure.
Patient 2 was 11-month-old boy of atrio-ventricular septal defect(AVSD) with severe hypoplastic left ventricle.Coronary angiography and three-dimentional reconstruction of computed tomography revealed the right coronary artery(RCA) arising from the left sinus of valsalva, which was high take off and run between pulmonary artery and ascending Aorta.
Results:
Patient 1 underwent RVOTR including reserved pulmonary valve, extended commissurotomy, RVOT muscle resection, and VSD closure through median sternotomy on cardiopulmonary bypass.Intraoperative pressure study demonstrated that RV pressure was 42mmHg at LV pressure 80mmHg.ECG showed no coronary ischemia.
Patient 2 underwent bidirectional Glenn with modified Damus-Kaye-Stansel procedures through median sternotomy on cardiopulmonary bypass.The technical modification was ascending aortic flap and gusset of artificial vessele.Those procedures avoided stenosis of RCA.
Postoperative course of both cases were uneventful.
Conclusions:
We report two success cases with the coronary anomaly.
To achieve precise diagnosis is importatnt to perform suitable procedure.

P18-3

USE OF CORMATRIX EXTRACELLULAR MATRIX FOR CORONARY ARTERY RECONSTRUCTION IN A PATIENT WITH CORONARY ARTERY STENOSIS AFTER ARTERIAL SWITCH OPERATION: A CASE REPORT

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Background: Arterial switch operation (ASO) for transposition of great arteries (TGA) in extremely low birth weight babies is still technically challenging and sometimes complicated by coronary artery stenosis. Materials that have been used for coronary augmentation have been far from satisfactory because of calcification or lack of growth potential, which results in future restenosis. Small intestinal submucosa (CorMatrix Extracellural Matrix) has been proved to promote connective tissue differentiation and to serve as a scaffold for remodeling of blood vessels. We experienced a case that underwent coronary artery augmentation using Cormatrix and retained good midterm patency with growth.

Methods: The patient was a pre-term baby of 30 weeks, weighing 1.4 kg with a diagnosis of TGA. He underwent ASO at the age of 5 days and was discharged home on postoperative day 44 without major complications. At the age of 20 months, he was noted to have chest discomfort with mild exertion. Cardiac catheterization showed that the left coronary artery was severely stenotic at the origin and only 1.5 mm in diameter. We emergently brought the patient to the operating room and performed a left coronary artery patch augmentation from the left coronary ostium to mid-left anterior descending artery using Cormatrix. The patient was discharged home on postoperative day 4 without any complications.

RESULTS: The patient has not complained of any chest discomfort since surgery and been growing well. Cardiac catheterization at one year and three years after surgery showed a patent left coronary artery without any stenosis or calcification, which appeared to have grown with the patient.

Conclusion: This is the first report of CorMatrix use in coronary artery reconstruction in pediatric patients. CorMatrix can be an attractive option with growth potential and no calcification on mid-term follow-up. Longer term follow-up is needed for better evaluation.

P18-4

LONG-TERM RESULT OF CONGENITAL CORONARY ARTERY FISTULA COMPLICATED WITH CORONARY DILATATION IN PATIENTS SURGICALLY TREATED IN INFANCY

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Objective: Congenital coronary artery fistula (CCAF) is a rare malformation which may potentially lead to heart failure, myocardial ischemia, infective endocarditis and rupture. It occasionally develops the marked dilatation of affected coronary artery even in infancy. The long-term result in patients who underwent surgical repair in infancy and the sequential changes of the coronary dilatation and its related complications were not well-known.

Patients and Methods:
Since 2003, 4 infants with CCAF underwent surgical repair in our institute. Their ages were from 2 to 6 months, and body weight ranged from 5.0 to 8.6 kg. The origin and the drainage site were; RCA to RV in 2, RCA to LV in 1 and LCA to LV in 1. Angiography demonstrated aneurismal dilatation of the coronary artery in all cases. The maximum diameter of the dilated coronary artery was 5.6 mm. Heart failure occurred in none, but ST-T change in electrocardiogram was documented in 2. All cases underwent trans-luminal direct closure of the fistula under cardiopulmonary bypass. No additional coronary angioplasty was attempted.

Results:
During the follow-up period up to 10 years, no early and late death occurred. No ischemic event was documented. Three patients underwent angiography and the other patient had been followed by magnetic resonance imaging. They showed that there was no residual shunt in all cases. The coronary dilatation had spontaneously disappeared in 3. The remaining one patient had persistent dilatation. However, it was located only in the orifice of RCA, and the arterial wall was smooth and not aneurismal. He has been under periodical observation without any medications.

Conclusion:
Long-term result of CCAF with dilated coronary artery after surgical repair in infancy is satisfactory. The coronary artery dilatation can be anticipated to improve by surgical closure of the fistula.

P18-5

PERIOPERATIVE RISK FACTORS FOR PROLONGED PLEURAL DRAINAGE AFTER THE EXTRACARDIAC CONDUIT FONTAN PROCEDURE

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Objective

Prolonged pleural drainage after the Fontan procedure contributes to mortality and prolonged hospitalization. In this study, we investigated the perioperative factors influencing persistent pleural drainage after Fontan operation for the purpose of reducing mortality and mortality.

Subject and Method

Twenty-eight patients who underwent extracardiac TCPC procedure were enrolled in this study. Our strategy of removing chest drain was amount of pleural effusion drainage decreased 10ml/kg/day or less. The mean duration of drainage was 92.1± 43 hours, and 7 patients needed pleural effusion aspiration and 2 patients needed pleural drain re-intubation. We compared two groups, Grope A; 18 patients needed no additional pleural effusion drainage after drains are extubated, Grope B; 9 patients needed additional pleural effusion drainage and 1 patient needed drainage over 192 hours. The variables analyzed as risk factors.

Results

No operative death. The univariate analysis showed that preoperative mean pulmonary artery pressure were higher (13.0±2.7 vs. 10±2.0mmHg, $p<0.01$), and period of inotropic agents (46.0±43.7 vs. 13.1±15.7 hours, $p<0.05$) and time of intubation (14.9±25 vs.1.4±3.5 hours, $p<0.05$) were prolonged in Group B. Preoperative atrial pressure and amount of blood transfusion almost reached statistical significance ($p=0.05$). In the multivariate analysis preoperative mean pulmonary artery pressure ($p<0.01$) and time of intubation ($p<0.05$) and period of inotropic agents ($p<0.05$) were significantly associated with prolonged chest tube drainage. On multivariate logistic regression analysis, preoperative mean pulmonary artery pressure and the patient needed mechanical ventilator and unextubated in OR were significantly associated with the persistent effusions.

Conclusion

Higher preoperative mean pulmonary artery pressure and prolonged period of inotropic agents and time of intubation were the risk factors of persistent pleural effusion. Early chest drain extubation is expected in the patients hemodynamically stable and do not need mechanical ventilator and extubated in OR.

P18-6

MIDTERM RESULTS OF PULMONARY ARTERY RECONSTRUCTION UTILIZING MAIN PULMONARY ARTERY

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(OBJECTIVE) We have previously reported the main pulmonary artery (MPA) translocation technique for left pulmonary artery (PA) stenosis. The midterm results were evaluated.

(METHODS) Since 2005, 15 patients had been performed the MPA translocation. The MPA was transected above the valve and was anastomosed to the distal left PA in an end-to-end fashion or utilized as a flap with or without pericardial patch. Seven patients had single ventricular physiology (SV), and eight had biventricular physiology (BV). Surgery was done at the time of systemic pulmonary shunt in 8 patients, bidirectional Glenn shunt in 4 patients, Fontan operation in one, and Rastelli operation in 2 patients. Median age at the surgery was 6.2 (range: 1-133) months old. Preoperative minimum size of the left PA was 2.9 mm in median (range: 1.0-4.0) and the diameter of distal left PA was 5.7mm (range: 2.5-10.0).

(RESULTS) Confluency of the central PA was preserved in all cases. One patient died from non-cardiac reason. Postoperative diameter of the reconstructed site of the left PA was 4.6mm (range: 1.4-7.5mm) and this was 27% increase in average. Among the six SV patients who had MPA translocation with palliative shunt, four had completed Fontan operation. Three patients out of six palliated BV patients had balloon dilatation of the left PA stenosis. Two of them had the additional Blalock-Taussig shunt on the hypoplastic left PA before definitive repair. Four patients waiting for definitive surgery had adequate size of PA.

(CONCLUSIONS) MPA translocation technique was effective to resolve left pulmonary stenosis in most cases. Although some patients had residual stenosis, catheter balloon dilatation was effective and all patients could avoid interruption of the central PA.

P18-7

THE APPLICATION OF ALL-AUTOLOGOUS THREE-SINUS REPAIR TO SUPRAVALVULAR PULMONARY STENOSIS

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Background: Various surgical techniques have been proposed to repair supravalvular pulmonary stenosis (SVPS) in pediatric populations. EA. Bacha describes all-autologous three-sinus repair that is analogous to a technique described for repair of supravalvar aortic stenosis. Whereas growth-potential should be promised, excessive expansion under the presence of undiminished high pulmonary arterial pressure should be avoided. They applied all-autologous three-sinus repair to SVPS and good results. We turned to surgical technique used by EA. Bacha and examined mid-term outcomes.

Methods: Between March 2010 and March 2012, 15 patients (8 males, median age of 12 months old) with SVPS underwent all-autologous three-sinus repair. Thirteen patients (87%) had previously undergone pulmonary artery banding to treat high pulmonary vascular resistance. Two patients (13%) had Noonan syndrome and associated with valvular pulmonary stenosis. Follow-up was complete in all patients and median follow-up period was 13.5 month (range, 1 month to 2.4 years). The data was presented as mean ± standard deviation (range).

Results: There was no mortality. The diameter of stenotic part at main pulmonary artery increased from 47.0±14.1% (29.1-70.0) of normal pulmonary artery diameter at preoperative evaluation to 108.9±25.7% (58.9-148.1) at 6 months, then 104.7±11.4% (87.7-134.1) at 1 year after the operation. Estimated pressure gradient across main pulmonary artery decreased from 76.2±12.2mmHg (57.8-108.2) at preoperative evaluation to 11.3±12.0mmHg (1.4-49.0) at 6 months, then 6.4±5.5mmHg (2.0-19.4) at 1 year after the operation. Pulmonary function was complicated at 6 months. However, it improved over time. Only 1 patient showed more than 25mmHg estimated pressure gradient across main pulmonary artery and carefully followed up, who had Noonan syndrome.

Conclusions: Mid-term outcomes after supravalvular pulmonary stenosis by all-autologous three-sinus repair were acceptable. Although long-term follow-up is mandatory, application of this technique may provide a symmetric and just enough growth of reconstructed main pulmonary artery.

P18-8

SUCCESSFUL SURGICAL CLOSURE OF A PARTIALLY UNROOFED CORONARY SINUS WITHOUT PLSVC

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Unroofed Coronary Sinus (CS) is a rare congenital cardiac anomaly in which there is partial (either focal or fenestrated) or complete absence of the roof of the CS, which results in a communication between the CS and the LA. It is important to diagnose unroofed CS because cerebral embolism can result from the right-to-left shunt. This condition is often difficult to diagnose, however, because the clinical signs and symptoms are nonspecific. This study reports a Unroofed CS without a persistent left superior vena cava (PLSVC) which is the rarest type of atrial septal defect(ASD). 37-year old female with past medical history of Pulmonic Stenosis (PS) and Patent Foramen Ovale (PFO) presented to our hospital with diplopia and diagnosed multiple cerebral embolism. Cardiac catheterization and Transe thoratic Echocardiography confirmed the diagnosis. Diagnosis of coronary sinus ASD before operation is difficult. Therefore we should pay attention to the location of the defect and the dilated coronary sinus in echocardiography for a correct diagnosis. In this case, the defect was located in the vicinity of the ostium of a large coronary sinus, therefore we could close the defect between the CS and the LA directly without any post operative complications.

P18-9

A NEW METHOD OF DRAINAGE TUBE PLACEMENT USING BLAKE DRAIN AT PEDIATRIC MINIMAL INVASIVE CARDIAC SURGERY

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Objective: We devised and examined the safety of a new method of the mediastinal drain placed through the edge of operative wound and the subcutaneous tissue without another wound for it as a part of pediatric minimal invasive cardiac surgery.

Methods: The 58 consecutive patients undergoing surgical repair for ASD or VSD with lower limited median skin incision at our institution between January 2008 and December 2010 were enrolled as new method group. The control group comprised 45 patients who had similar surgery with dedicated drain hole between May 1997 and December 1999. We compared patient's back ground and perioperative data between the two groups.

Results: There were no significant differences between two groups in age (39.0 vs. 38.9 months, $p>0.05$) and body weight (12.6 vs. 12.8 kg, $p>0.05$). Operation time (152 vs. 264 min, $p<0.01$), extracorporeal circulation time (57 vs. 84 min, $p<0.01$), aortic cross clamping time (41 vs. 55 min, $p<0.01$), drainage time after operation (5.6 vs. 34 hours, $P<0.01$), length of hospital stay after operation (4.2 vs. 8.4 days, $p<0.01$) were shorter in new method group. Drainage volume was smaller in new method group (48 vs. 130 ml, $p<0.01$). One patient needed drainage for late cardiac tamponade in control group. One patient developed mild accumulation of pericardial effusion after discharge in control group. There were no acute cardiac tamponade and mediastinitis in the two groups.

Conclusions: This new method was safe and beneficial for minimize the wound at pediatric minimal invasive cardiac surgery.

P18-10

EFFICACY OF TRANEXAMIC ACID ON BLOODLESS MANAGEMENT OF PEDIATRIC CARDIAC SURGERY

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OBJECTIVE: Our strategies of bloodless cardiac surgery included preoperative administration of iron and erythropoietin, prime volume reduction of bypass circuit, intraoperative autologous blood donation, blood cell salvage and ultrafiltration. The aim of this study was to evaluate the blood-saving effect of tranexamic acid (TXA) in pediatric cardiac surgery.

METHODS: Consecutive 41 children weighing less than 20kg, who underwent bloodless cardiac surgery for atrial or ventricular septal defect at Kobe Children's Hospital from January 2011 to November 2012, were enrolled in this retrospective study. In the operative period, 21 children after January 2012 received intraoperative TXA infusion (Group A), and the remaining 40 children did not (Group B). Patient demographics, perioperative data and outcomes were analyzed between the two groups.

RESULTS: There were no significant differences of patient characteristics and preoperative data between Group A and Group B: age, 2.6±1.6 vs. 2.4±1.8 years old; body weight, 11.6±3.5 vs. 11.4±3.7kg; preoperative hemoglobin (Hb) and hematocrit (Hct), 13.1±1.3 vs. 13.2±1.2 g/dL and 38.8±3.3 vs. 39.0±2.8%. Intraoperative lowest Hb<6.0 g/dL, Hct<20.0% or SvO_2<70.0% were observed in 13 of 40 children (32.5%) in Group B, whereas only 3 of 21 children (14.3%) in Group A. Postoperatively, maximal level of serum lactate was significantly lower in Group A. The Hb and Hct at 24 hours after operation was significantly higher than those in Group B (Hb, 10.8±1.5 vs. 9.7±1.2 g/dL, p=0.005; Hct, 31.8±3.8 vs. 28.8±3.5%, p=0.003). The total amount of drainage from chest tubes was significantly less in Group A. Intubation period and hospital stay were significantly shorter in Group A. No thromboembolic event has occurred perioperatively.

CONCLUSIONS: TXA treatment was effective for blood conservation, and able to improve postoperative outcomes in pediatric cardiac surgery. Intraoperative TXA infusion would be included as one of novel management strategies for bloodless cardiac surgery in children.

P19-1

THORACIC SYMPATHECTOMY TWO-YEAR EXPERIENCE: RARE INDICATIONS AND COMPLICATIONS

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Summary

Aim:In this study, rare indications and complications of the bilateral thoracic sympathectomy performed for hyperhidrosis were evaluated retrospectively between 2009-2011 in the Private OSM Ortadogu Hospital Chest Surgery Clinic

Material and Methods:Bilateral sympathectomy and video-assisted thoracoscopic surgery (VATS) was performed in18 patients in the same session. Thoracotomy was required in none of the operations.

Results:Some of the rare indications and complications developed are as follows: Early postoperative recurrence was observed in the right axillary hyperhdrosis, and success was achieved with right-T5 underwent thoracoscopic sympathectomy in this patient. Unilateral sweating of the face in 2 patients was successfully treated by unilateral thoracoscopic T2 sympathectomy. Postoperative paralysis of the diaphragm was detected in 1 patient, and improved in 3 months. Left axillary recurrence and ipsilateral pneumothorax was seen in 1 patient on the third postoperative day. 2 days after treatment of pneumothorax, the sweating improved spontaneously.

Conclusion:As a conclusion; although its rare Indications and complications; thoracic sympathectomy for hyperhidrosis that causes social, mental disorder by excessive sweating of hands and axilla, can be treated successfully with minimally invasive VATS sympathectomy

Key words: Sympathectomy, excessive sweating, Sweating reflekes

P19-2

STANDARDISED DEFINITIONS OF VATS PORTS TO THORACOTOMY: CASE FOR THORACOTO-SCOPY

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Significant overlapping and lack of homogeneity exists in the current nomenclature & reporting of video-assisted, minimally invasive and even the so-called open thoracic surgical procedures. This is particularly true regarding the length of the access incisions used as well certain aspects of the operative techniques. This heterogeneity in labeling & reporting makes it difficult to compare the results of various open & VATS procedures. There is need for a standardisation of the surgical terminologies used to describe Thoracic operations, ranging from standard Thoracotomy to total VATS; with a graduated, objective transition, covering the whole range of procedural titles.

The author is proposing a simple, objective nomenclature system of defining the complete range of titles of thoracic surgical operations from large Thoracotomies to total VATS. This classification covers the definitions of standard Thoracotomy, mini-Thoracotomy, VATS & access port dimensions. It is based upon human anthropometric measurements and includes the criterion of the length of the incision, use of rib spreader, use of dedicated VATS or non-VATS Instruments and the intra-cavity use of surgeons' hand/s.

A new term of "Thoracoto-scopy" is suggested to describe the video-assisted hybrid access and to make the definitions smoothly graduated.

P19-3

THE FEASIBILITY OF MEDICAL THORACOSCOPY IN THE TREATMENT OF MULTI-LOCCULATED PLEURAL EFFUSION

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Objective : Optimal surgical procedure must be selected according to empyema stage in the treatment of multi-locculated empyema. However, it is difficult to select the optimal procedure using conventional staging system. The medical thoracoscopy is an ideal diagnostic tool of pleural disease, we used medical thoracoscopy to evaluate the accurate staging of empyema and to select optimal surgical procedure.

Methods : 108 patients were transferred to treat multi loculated pleural effusion. The type of surgical procedure was selected according to the empyema stage of American Thoracic Society. Group Ⅰ (n=44) was staged according to conventional staging system such as onset time, pleural fluid finding and computed tomography findings, and group Ⅱ(n=64) according to the finding of medical thoracoscopy.

Results : There was no significant difference of morbidity and mortality between two groups ($p<0.05$). The 20 closed thoracostomy (45.5%), 6 Video-Assisted Thoracoscopic Surgery (VATS) decortication (13.6%), and 18 open decortication (40.9%) were performed in group Ⅰ, 16 cases of 18 open decortication were undertaken due to thd failure of first treatment (12 closed throacostomy, 4 VATS decortication). In group Ⅱ, 43 loculation bloken up and closed thracostomy during medical thoracoscopy (67.2%), 15 VATS decortication (23.4%), and 6 open decortication (9.4%). There was no failure primary procedure. The procedure of group Ⅱ is significantly lesser invassive and the thoracotomy rate is also lower than group Ⅰ ($p<0.05$)

Conclusion : The medical throacoscopy is helpful to decide the optimal procedure in the treatment of multiple loculated empyema. We could decrease the incidence of open thoracotomy in the treatment of multi-loculated pleural effusion.

P19-4

THE SIMULTANEOUS STAPLING TECHNIQUE REVISITED: IS THIS AN ACCEPTABLE 'BAIL-OUT PROCEDURE' DURING DIFFICULT CASES OF VATS LOBECTOMY FOR LUNG CANCER?

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OBJECTIVE: Simultaneous Stapling (SS) of the bronchus and vessels was used for lobectomy in the early years of Video-Assisted Thoracic Surgery (VATS), but individual Isolation-Ligation/Division (ILD) of these structures is nowadays preferred. Whether SS remains a viable alternative to conversion to open surgery in difficult cases of VATS lobectomy is unknown.

METHODS: Data regarding the technique of bronchus/vessel division were available for 236 patients receiving VATS lobectomy for confirmed/suspected lung cancer by a single surgeon. In 41 patients (17%), conversion to mini-thoracotomy with ILD was required because of intra-operative bleeding, difficult dissection or large tumors. In 33 patients (14%) with similar difficulties, VATS lobectomy was completed using SS without conversion.

RESULTS: In all study arms, demographic and clinical characteristics were similar and there was no mortality. Patients receiving SS lobectomy had similar post-operative morbidity rates as those who had ILD. Compared to conversion-with-ILD, the SS technique was associated with a shorter mean operation time (147±59 mins versus 225±65 mins, $p<0.001$), and less intra-operative blood loss (181±181ml versus 486±632ml, $p=0.007$). Conversion-with-ILD was associated with a higher prevalence of significant pain on post-operative day 1 compared to complete VATS with ILD (47% versus 22%, $p=0.007$), and also longer chest drain durations (8.2±6.1 days versus 5.8±5.0 days, $p=0.031$) and lengths of stay (10.6±6.4 days versus 8.5±5.5 days, $p=0.051$). In contrast, SS lobectomy gave similar average post-operative pain scores, chest drain durations and lengths of stay as complete VATS with ILD. Amongst 224 patients confirmed to have primary lung cancer on histology, Kaplan-Meier analysis demonstrated similar stage-specific recurrence-free survival amongst patients receiving SS and ILD.

CONCLUSIONS: Simultaneously stapled lobectomy offers equal safety and oncological outcomes as conventional ILD lobectomy for lung cancer. In difficult VATS operations, SS allows more expedient completion of lobectomy than conversion with similar post-operative recovery to complete VATS with ILD.

P19-5

PNEUMOTHORACES DUE TO THE PUNCTURE OF THE BULLAE LOCATED AT AZYGOESOPHAGEAL RECESS IN ELDERLY PATIENTS WITH EMPHYSEMA

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OBJECTIVES: This study aims to evaluate the efficacy of video-assisted thoracoscopic surgery(VATS) in the treatment of pneumothorax due to the unusual bulla originating from the right lower lobe in elderly patients with chronic obstructive pulmonary disease (COPD).

METHODS: Five patients with COPD who underwent video-assisted thoracoscopic surgery at Kyoto Katsura Hospital between 2009 and 2011 were reviewed retrospectively.

RESULTS: All five patients were men (age, 58-71) and had a smoking history (pack-year,30-66) and presented emphysematous lung on chest computed tomography. Two patients underwent surgery at first episode, whereas the others had repeated ipsilateral pneumothoraces. One patient had a history of chemical pleurodesis. Simple chest tube drainages were done preoperatively in all patients who had right sided pneumothoraces with persistent air leak (days, 4-11). Ruptured bullae, originating from S6 located at azygoesophageal recess, were identified to be responsible for pneumothoraces at the time of the operation in all patients. Simple ligation of the affected bulla was enough. There were no postoperative air leaks and complications, resulted in earlier chest tube removal (days,1-3) and shorter hospitalization (days,3-10) postoperatively.

CONCLUSIONS: VATS ligation of ruptured bulla is associated with low morbidity and short hospital stay and provides an attractive alternative to the conventional thoracotomy with pleurectomy or pleurodesis for treatment of pneumothorax in elderly patients with COPD.

P19-6

THORACOSCOPIC SURGERY FOR INTRACTABLE PNEUMOTHORAX COMPLICATED WITH INTERSTITIAL PNEUMONEA

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Introduction. For intractable pneumothorax complicated with interstitial pneumonia, simple operation, such as lung resection or ligation, is often unsuccessful. The purpose of this study is to evaluate the efficacy and safety of our surgical method using polyglycolic acid (PGA) felt and endoscopic clip for intractable pneumothorax complicated with interstitial pneumonia (IP).

Case and Methods. A 83-year-old male was admitted to the hospital because of dyspnea. Chest CT revealed bilateral honey-comb lung and left pneumothorax. Free space was not reduced by thoracic drainage over 2 weeks. Under thoracoscopic examination, the rupture of bullous lung was detected. Our procedures were as follows. After thoracoscopic examination, we tried to treat with PGA felt and fibrin glue on air leak site. Endoscopic clip was used to fix the PGA felt with the edge of the lung. After the operation, thoracic drain was removed within several days. Afterall, this patient had an uneventful recovery on follow-up.

Conclusion. Thoracoscopic surgery with PGA felt and endoscopic clip appeared to be safe and effective for the closure of ruptured honey comb lung, even if it was IP lung.

P19-7

BILATERAL TENSION PNEUMOTHORAX SECONDARY TO HISTIOCYTOSIS X AND ITS TREATMENT VIA VIDEO-ASSISTED THORACOSCOPIC SURGERY (VATS): A CASE REPORT

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Langerhans cell histiocytosis (LCH) is rare disorder and treatment of its complications including spontaneous pneumothorax is also an evolving field. In the past only one attempt at employing Video-assisted thoracoscopic surgery (VATS) for treating bilateral spontaneous pneumothorax (SP) secondary to histiocytosis has been cited in literature.

We present to you a case of a 17 year old male who presented with the clinical and radiological features suggestive of Langerhans cell histiocytosis. The patient on initial evaluation had developed right sided spontaneous pneumothorax followed a day later by spontaneous pneumothorax on the opposite side.

The role of VATS in the treatment of primary spontaneous pneumothorax is undisputed, however thoracic surgeons are reluctant to use VATS as a surgical approach in treating secondary spontaneous pneumothorax. Our experience, of the treatment of bilateral spontaneous pneumothorax secondary to histiocytosis with bilateral VATS, could lay the grounds for the use of this surgical approach to treat this complication of Langerhans cell histiocytosis.

P19-8

RESECTION OF POSTERIOR MEDIASTINAL TUMORS BY VIDEO ASSISTED THORACIC SURGERY IN A TERTIARY CARE HOSPITAL IN A DEVELOPING COUNTRY: A BRIEF REPORT

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The posterior mediastinum plays host to a variety of tumors and cysts, of which tumors of neurogenic origin make the bulk. These tumors occasionally go undetected and mainly present with compressive symptoms of surrounding structures or are detected incidentally on radiological investigations. Resection was usually done via posterolateral thoracotomy, but over the last few years, it has been gradually replaced by Video Assisted Thoracic Surgery in developed countries. However, this is the first time such a procedure has been done in a tertiary care centre in a developing country such as ours and with satisfactory results. Our first patient was a 45yr female who presented with a dull ache in her back. CAT scan of the chest showed a 4x4.5cm mass in her left paravertebral space. The second patient was a 52yr old male who had pain in the right side of his neck and upper back. CAT scan showed a 3x3cm mass in his paravertebral space.

P19-9

THREE CASES OF DESCENDING NECROTIZING MEDIASTINITIS TREATED BY VIDEO-ASSISTED THORACOSCOPIC MEDIASTINAL DRAINAGE

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OBJECTIVE: Descending necrotizing mediastinitis (DNM) is a severe disease with a higher mortality. We herein report three cases of DNM treated by video-assisted thoracoscopic drainage. Case 1: A 56-year-old man with diabetes mellitus (DM) was admitted to our hospital complaint of dyspnea and neck swelling for a week. The computed tomography (CT) scan showed the neck abscess and neck drainage was performed. However, the abscess extended to upper and middle mediastinum on CT scan. We performed video-assisted thoracoscopic mediastinal drainage. The thoracic drains were removed on the 10th day and he was uneventfully discharged on the 38th day after the operation. Case 2: A 42-year-old man with rheumatoid arthritis and DM consulted the emergency room of our hospital complaint of high-grade fever, systemic pain and edema for a week. Next day after admission, he went into septic shock causing by necrotizing fasciitis of the right leg and underwent surgical debridement. Despite his general condition was restored, he developed neck abscess and extended to upper mediastinum after neck drainage. We performed video-assisted thoracoscopic mediastinal drainage. The thoracic drains were removed on the 14th day and his course was uneventful. Case 3: A 68-year-old woman with rheumatoid arthritis and systemic lupus erythematosus consulted the emergency room of our hospital complaint of back pain for a few days. Blood examination test showed white blood cell counts of 1100/uL and C-reactive protein concentration of 41.0mg/dl. On arrival and soon, she went into septic shock. The CT scan showed retropharyngeal abscess, descending necrotizing mediastinitis and necrotizing fasciitis. We performed video-assisted thoracoscopic mediastinal drainage and retropharyngeal drainage. However, she died dued to multiple organ failure at 17th postoperative day. CONCLUSION: Video-assisted thoracoscopic mediastinal drainage for DNM is less invasive and effective method, whereas the accuracy of timing is crucial.

P20-1

A CASE OF PULMONARY CRYPTOCOCCOSIS WITH UNILATERAL PLEURAL DISSEMINATION

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We report a case of pulmonary cryptococcosis with pleural dissemination. A 50-year-old female with a pulmonary nodule was referred to us for farther investigations. The resection of rectal cancer (adenocarcinoma, stage II) was performed 2 years ago, and follicular lymphoma was diagnosed on the basis of pathological findings of the dissected paraaortic and pelvic lymph nodes at the operation. The patient had received six cycles of chemotherapy after the operation. A chest computed tomography (CT) scan revealed a small round-shape nodule in the left S10 and multiple small nodules on the parietal pleura. However, positron emission tomography/CT showed no accumulation in all nodules. Tumor markers were negative and blood test showed no infectious findings. From the findings, metastatic tumor with pleural dissemination from previous lymphoma or rectal cancer was considered. For the diagnosis and planning the treatment, the operation was scheduled. Intrathoracic findings showed that there were many small, round-shape, and white-colored nodule on the visceral and parietal pleura, and there was an intrapulmonary nodule with same condition in S10. A partial lung resection with the S10 nodule and excision of a parietal nodule were performed by thoracoscopic surgery. Finally, these nodules were diagnosed as pulmonary cryptococcosis from the pathological findings. Pulmonary cryptococcosis tends to be occurred in the immunocompromised hosts especially during chemotherapy for malignancies. Pulmonary cryptococcosis usually makes a nodule in the peripheral lung which shows a similar appearance of malignant tumor on CT scans. Therefore, we performed operation for distinguishing it from malignancy. In this case, however, it was quite difficult to distinguish it from malignant tumor with dissemination even after operation. This case is quite rare because there was no report concerning pulmonary cryptococcosis with pleural dissemination lacking pleuritis. We should consider this disease if we see the patients with multiple pulmonary and pleural nodules.

P20-2

SURGICAL MANAGEMENT FOR RUPTURED MEDIASTINAL TUMORS

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<Objective>
Ruptured mediastinal tumors are rare, and it is important how we manage a surgery for them safely and precisely.
<Methods>
Case 1; A 16-year-old female was referred to our hospital due to acute pain in her left back pain and fever elevation. A chest CT showed a cystic mass in the left anterior mediastinum with inflammation of the surrounding mediastinal fat tissue and a small amount of left pleural effusion. After administration of antibiotics for a week, the cystic mass was resected via VATS (Video-Assisted Thoracic Surgery) as an elective surgery (20 days after onset). The pathological diagnosis was teratoma, and her postoperative course was uneventful.
Case 2; A 27-year-old male consulted us because of his chest pain, headache and fever elevation. A chest CT revealed a cytic-like tumor, sized 8 cm in a diameter, in the anterior mediastinum. The tumor was ruptured and caused the mediastinis with bilateral plural effusions. After conservative treatment for 2 weeks, we performed tumor resection with trans-sternal mediastomy as an elective surgery. It was diagnosed ruptured thymoma.
<Results>
Although the former tumor adhered to the adjacent lung, we could easily separate out them. The latter heavily adhered to pericardium, but its inflammatory reaction was relatively localized. The both tumor was completely resected without blood transfusion.
The duration of surgery and intraoperative blood loss are 1 h 30 min and 80 g, 3 h 22 min and 70 g, respectively. No perioperative complications were noted in both cases.
<Conclusions>
The surgical procedures for ruptured tumors at acute phase are not so easy because of increase of serious operative risks such as bleeding or systemic inflammatory reactions. Elective surgeries after initial conservative treatment are recommended for mediastinal tumors with acute inflammation if possible.

♥ P20-3

THE EFFECF OF TYPE 2 DIABETES MELLITUS ON THE TREATMENT OUTCOME IN PATIENTS WITH MULTIDRUG-RESISTANT PULMONARY TUBERCULOSIS

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OBJECTIVE : The aim of this study was to invest whether diabetes mellitus affect clinical presentations and treatment responses in patients with multidrugs resistant tuberculosis (MDR-TB).

METHODS :To evaluate whether DM affect severity and outcomes, our study have focused on the patients who first diagnosed MDR-TB with DST confirmed. Patients who had previous anti-tuberculosis medication except 1st line drugs and defaulted patients are excluded also in our study. By choosing the sespecial patients group, we can control many confounding factors.
Between January 2004 and December 2010, 792 patients were diagnosed with MDR-TB. All of these patients had smear or culture results that were positive for M. tuberculosis. Of these patients, 284 of defaulted patients and 247 of having previous anti-tuberculosis medication without 1st line drugs were excluded. Enrolled 261 patients were classified as having MDR-TB with (MDR-TB with DM) or without (MDR-TB without DM) type2 DM. MDR-TB with DM patients were classified as well controlled DM group and poor controlled DM group. Findings for patients with MDR-TB with DM were compared with findings for patients with MDR-TB without DM. And findings for patients with well controlled DM were compared with findings for patients for patients with poor controlled DM group.

RESULTS : Degree of radiologic severity ($p<0.01$), mycobacterium loads (smear $p<0.01$, culture $p<0.022$) treatment result ($p=0.025$) differed between MDR-TB patients with DM and those without DM. Only sputum mycobacterium loads differed between treatment between well controlled DM with MDR-TB group and poor controlled DM with MDR-TB group (smear $p=0.014$, culture $p=0.032$).

CONCLUSIONS : According to our result, DM may be important poor prognostic factor of MDR-TB and strict control of DM is important in MDR-TB. This indicate that additional prospective studies are warranted in order to more precisely determine the influence of diabetes on MDR-TB.

♥ : Travel Grant

P20-4

GIANT BRONCHIAL ARTERY ANEURYSM: A RARE CAUSE OF MEDIASTINAL MASS

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(OBJECTIVE):

Bronchial Artery Aneurysm (BAA) is a rare entity, but with potentially fatal hemorrhagic complications when ruptured. Intervention is advisable once diagnosed. Until the past decade, bronchial artery aneurysms were treated surgically. However it associated with high morbidity and mortality, particular for large sized aneurysm. Some reports have advocated transcatheter bronchial arterial embolization (BAE) as a less invasive treatment for BAA.

(METHODS)

We report a case of giant bronchial artery aneurysm which treated with BAE.

(RESULTS)

A 65 years old lady who previously with good past health had incidental finding of large right lower paratracheal mass on chest radiography. Computed tomography (CT) showed 6x5 cm roundish avid contrast enhancing posterior mediastinal mass. Bronchial artery angiogram confirmed the presence of right BAA with feeding artery originated from descending aorta. BAE was performed via right common femoral artery cannulation. Interlock coils were applied to the feeding artery. After embolization, angiogram showed the feeding artery to right BAA was occluded with no more contrast filling. Chest radiography showed the aneurysm had decreased in size after the procedure. The patient was remaining well afterward.

(CONCLUSIONS)

Because of life threatening hemorrhagic risk, intervention to BAA has been recommended irrespective of the presence of symptoms. Surgical procedures such as lung resection or ligation of the aneurysm have been associated with high morbidity and mortality. Thus, endovascular approach such as BAE have been increasingly applied. Our patient was being well after BAE and the aneurysm had decreased in size after the procedure. Transcatheter bronchial arterial embolization for BAA is advisable and is the first choice for treatment of BAA.

P20-5

MULTIPLE LOCALISED HYDATID CYST

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Introduction: Hydatid cyst disease which is caused by echinococcus granulosus still poses a serious problem in endemic areas. The disease often affects liver and lungs. Other organs are rarely affected. In a patient with bilateral lung, right ventricular, liver and spleen involvement, in order to show the effect of albendazol on lungs and other organs the case is reported and researched with literature.

Case: 18 years old, shepherd and has been observed approximately for 30 months because of multiple hydatid cyst. In patient's radiological examinations, multiple hydatid cyst, right ventricular and lesions in liver right lobe and spleen consonant with hydatid cyst are ascertained. In thoracic CT in 2010, in right lung middlelobe lateral segment 15x28 mm cyst in size, 2 cysts in right lung lower lobe posterior segment 3x2x3 cm in size, left lung apiko pesterior 4x3x4 cm cyst in size, in left lung upper lobe lingular segment 4x4x4 cm cyst in size, left lung lower lob lateral 3x3x3 cm cyst in size and in left lung lower lob posterior 2x2x4 cm cystic lesion are detected.

Conclusion: In the subject who has been followed since 2010, while bilateral lung, heart, liver and spleen involvement are existent, due to widespread organ involvement, surgical intervention was not preferred and the treatment was continued with albendazol. It was seen that with the help of albendazol treatment the cyst in spleen and liver totally removed and they cyst in heart became smaller and later died. It was observed that there was not any decline in the number and size of cysts in lung. That is why we are of the opinion that thorough researches aimed at effectiveness of the albendazol treatment for lung hydatic cyst have to be done; dose, duration and periods of 28 days should be identified for lungs again.

P20-6

PANCREAS, SPLEEN, DUEDONUM ASSOCIATED CONGENITAL DIAPHRAGMATIC HERNIA CAUSING HYPOPLASTIC LUNG

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Introduction: Congenital diaphragmatic hernia occurs in 1 in every 2500 live birth and most of them are diagnosed during childhood. It is very rare for colon, stomach, small intestine, omentum, spleen, duedonum and pancreas to be herniated all at once and cause hypoplastic lung. We discussed the subject with multiple organ herniation associated hypoplastic lung which has stayed asymptomatic for a long while and who had developed esophagus and stomach perforation as a result of strangulation during pregnancy.

Case: 44 years old woman patient who is 8 months pregnant(first pregnancy) arrived at the emergency department with complaints of dyspnea, somnolence and tachycardia(180/bpm). In her chest radiography, an image was detected showing hydatid cyst rupture compatible with air-fluid level in left lower zone and emergency c-section and thoracotomy was planned. For the detected hypernatremic electrolyte abnormality fluid resuscitation was started and the patient was taken to the operating room. Emergency cesarean section was performed. In the same session, the patient was turned with left side up and left thoracotomy was performed. It was seen in the thoracotomy that the lesion in chest X-ray which was interpreted as cyst hydatid was strangulated stomach and the stomach was ruptured from the level of cardia. It was seen that there were hernia in thoracic cavity; in colon, small intestine, omentum, pancreas, spleen, duedonum along with stomach. Based upon the multiple organ herniation, hipoplastic was detected in the left lung.

Conclusion: If occured with an added pathology, it might creat a life-threatening clinical complication. Therefore, an attentive clinical examination and detailed history will greatly help the clinician. Additionally, during routine pregnancy tests dyspnea and intestinal complaints should be questioned and if necessary, during the ultrasonic screening of the pelvic area, abdomen and thorax should be screened, as well.

P20-7

THE ACUTE RESPIRATORY INSUFFICIENCY IN TWO DAYS OLD BABY AND THYMIC CYST CAUSING SUBTOTAL ATELECTASIS: PRESENTATION OF A FACT

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INTRODUCTION:

Thymic cysts are begign lesions that can frequently be seen in neck and mediastinum. It is commonly obtained in two years old children and it becomes symptomatic in these ages. In our fact respiratory insufficiency is obtained after birth as an extraordinary situation and also shift in mediastinal organs and a cystic structure is found in upper mediastinum and right thorax which creates atelectasis in the right lung. By having operation at the age of two days is a rare fact in recovery.

PRESENTATION OF THE FACT:

Our patient is 0 year old baby girl in whom a serious pathology was assigned during prenatal Non-stress test applied to pregnant and was taken out by immediate caesarean section. The patient was taken into intensive care unit because of respiratory insufficiency. Physical inspection and vital symptoms showed acute respiratory insufficiency. After the immediate chest radiography , Toraks BT of the baby was taken because of pneumothorax pre-diagnosis suspicion in whom right pneumothorax was obtained in pre-diagnosis . Radiology reported the symptom as congenital lobar emphysema causing right subtotal atelectasis. Immediate operation was decided for the baby due to deterioration in general condition, increase in tachycardia and decrease in saturations.

Right lateral thoracotomy mediastinal cyst and total excision of the mass was done and frozen thymic was reported as cyst. The baby was intubated into intensive care unit. After 15 days of intubation the baby was extubated sound and safe.

RESULT :

According to our observations, the excision of cystic lesions in babies having acute respiratory insufficiency and deterioration is life saving.

Key words: congenital thymic cyst, mediastinal cysts.

P20-8

THE REVIEW OF 147 BLUNT CHEST INJURY PATIENTS

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Objective:
The blunt chest injury often leads to life-threatening condition. The clinical course depends on the severity of thoracic damage, existence of injuries in other organs, and patients characteristics. The purpose of this study is to find the therapeutic management that contributes to the patients' prognosis and short hospitalization.

Method:
Between May 2009 and January 2012, 147 patients with blunt chest injury were hospitalized in Shinyukuhashi hospital, which is local medical aid center, Japan. Their clinical background and course were reviewed retrospectively.

Result:
88 men and 59 women were included. Age was 65.6 years (17 - 91). Six bi-lateral cases were included. Rib fracture was identified in 134 (91.2%) cases. In 45 (30.6%) cases, thoracic drainage was required for their hemo and/or pneumothorax. Thoracic surgeries were performed in 8 (5.4%) cases (1 hemostasis by thoracotomy, 1 removal of hematoma by video assisted thoracic surgery, 3 reductions of rib fractures, 3 closures of air leakage from the lung). In the clinical course of 44 (29.9%) cases, therapeutic interventions by doctors other than thoracic surgeons were required (17 cases with surgical debridement and/or suture for wide skin injury, 11 transcatheter arterial embolizations for bleeding organs including other than the chest area, 8 reductions of bone fracture in the extremity, 6 reductions of clavicle fracture, 1 laparotomy for damaged intestine, 1 percutaneous transluminal coronary angioplasty for myocardial infarction). The median length of hospital stay was 13 days (0 -157). Twenty-five (17.0%) patients required long hospitalization for more than 30 days with rehabilitation. One hundred sixteen patients (78.9%) discharged to their home, 22 (15.0%) patients transferred to convalescent facilities, 9 (6.1%) patients died.

Conclusion:
The team medical care and cooperation with other medical facilities are very important to improve patients' prognosis and reduce the length of hospitalization.

P20-9

LONG TRACHEAL REPLACEMENT WITH TISSUE ENGINEERED PROSTHESIS

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We developed a tissue engineered prosthesis which potentially realizes tracheal replacement as long as 50 mm in canine model.

Material and Methods: The collagen-conjugated tracheal prosthesis: The prosthesis consists of a framework and a collagen layer. The frameworks were fine polypropylene mesh cylinders, 50 to 80 mm long with an internal diameter of 20 mm, reinforced with polypropylene rings (1 mm in diameter). The frameworks were conjugated with foamed collagen layer 5 mm thick around the frame. The prosthesis was placed in the canine peritoneal cavity wrapped with the omentum prior to the tracheal replacement. After three weeks of inoculation, the pedicled omentum-prosthesis complex was introduced to the thoracic via the diaphragm. The tracheas of three animals were resected for 30 mm and replaced with the 50 mm long pedicled prostheses. The tracheas of two animals were resected for 50 mm long and replaced with the 80 mm long pedicled prostheseis. Anastomoses were made in a telescopic manner.

Results: After three weeks of inoculation, the prostheses were incorporated to the host tissue. Periodical bronchoscopy examination revealed that the luminal surface was fully covered with host tissue and neo-vasculization. No dehiscence, no obstructive change was observed. The luminal surface was covered with ciliated epithelium and the blood supply from the omentum was confirmed by contrast-enhanced study.

Conclusion: Long tracheal replacement with tissue-engineered prosthesis which were fully vascularized was successfully achieved in canine experimental model.

P20-10

PULMONARY PARAGONIMIASIS PRESENTED WITH NONMASSIVE HEMOPTYSIS, 2 CASES REPORT

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Abstract

Backgound and Objective: Pulmonary paragonimiasis is rare. We reported our 2 interesting cases of this disease presented with nonmassive hemoptysis and were treated as pulmonary tuberculosis for surgery.

Material and Method: A 46-year-old married woman from Phrae province and 47-year-old man referred from Phrae provincial hospital were referred to chest unit, faculty of medicine, Lampang hospital. Both of them presented with symptoms of coughing, nonmassive hemoptysis, pleuritic chest pain without weight loss. They both had abnormal cavitary nodule from CXR with no previous film to be compared, sputum were negative for AFB, so, pulmonologist sent them for CT Chest and consult cardiothoracic surgeon for surgery.

Results: Both cases were performed lobectomy.Pathology results showed Pulmonary Paragonimiasis(helminth worms and eggs were demonstrated) which were treated with Praziquantel with unevenful recovery during close follow up.

Conclusion: we report this case to remind the possibility of pulmonary paragonimiasis in patients of our endemic region presenting with compatible clinical features of pulmonary tuberculosis. In such situations, pulmonary paragonimiasis should be ruled out by sputum examination for the eggs of Paragonimus westermani by microbiologists. This will ensure an awareness to detect earlier recognition of this disease and may help to avoid surgery or potentially complicated clinical course.

P20-11

EXTENSIVE MEDIASTINAL ASPERGILLOSIS PRESENTING WITH DYSPNEA AND CARDIAC TAMPONADE SYMPTOMS: REPORT OF A CASE

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We report a case of an 18 year old girl who presented with progressively worsening shortness of breath, orthopnea, malaise and low-grade fever for three years, and generalized body swelling for six months. On examination she was found to have tachycardia, raised JVP, bilateral pedal pitting edema and muffled heart sounds with bilateral basilar lung crepitations. Investigations revealed a wide mediastinum and showed a conglomerate undefined mass encasing the entire heart and great vessels with most marked extension in the retrocardiac area. Video-assisted thoracoscopy (VATS) was performed and biopsy of the mass was obtained which grew Aspergillus flavus. The patient was started on itraconazole and showed a remarkable recovery in her symptomatology in the first six weeks after follow-up and is currently doing well. A review of the literature revealed that Aspergillus causing such a deadly and invasive manifestation has been rarely described. In the few existing reports, treatment was generally symptomatic or fatal otherwise, especially in immunocompromised individuals, despite treatment with antifungal medication and surgery.

P20-12

PULMONARY NOCARDIA PRESENTING AS AN ASYMPTOMATIC LUNG MASS IN A JAPANESE PATIENT WITH RHEUMATOID ARTHRITIS: A CASE REPORT

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Nocardiosis is an uncommon infectious disease caused by aerobic actinomycetes in the genus Nocardia. Nocardia are filamentous bacteria found worldwide in the soil, decaying organic matter and aquatic environment. Nocardiosis can follow an acute, subacute or a chronic course in which it can manifest either as localized or as a systemic, suppurative illness. Localized manifestations include pulmonary, CNS, cutaneous or lymphocutaneous or a single lesion at an extrapulmonary site. Patients with an immunocompromised status are more likely to develop pulmonary or invasive nocardial infections. Cases of Pulmonary Nocardiosis in conjunction with rheumatoid arthritis, sarcoidosis, tuberculosis, or HIV infection have been reported previously. Patients who were known cases of rheumatoid arthritis were on medical therapy that included corticosteroids and other immunosuppressant drugs like adalimumab and Infliximab which consequently contributed to the immunosuppressed state of the patients. A case report of a Japanese patient, working in Pakistan, who was a known case of rheumatoid arthritis since 5 years, mentions the isolation of a new strain of Nocardia Strain IFM 10035^{T}. It has been proposed to call the new strain Nocardia arthritidis. To the best of our knowledge few similar cases of pulmonary nocardiosis and rheumatoid arthritis occuring together have been reported in literature.

P21-1

HILAR AND MEDIASTINAL LYMPH NODES AND THE HISTOPATHOLOGICAL DIAGNOSIS OF NSCLC PLACE OF THE RELATIONSHIP BETWEEN

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Summary

Introduction : Generally, lung cancers are observed under two different titles such as small cell lung cancer and non-small-cell lung carcinoma. The first alternative of the treatment of NSCLC is surgical theraphy. One of the components of tumor staging is whether there is tumor metastasis in mediastinal and hilar nodes or not. It is not certainly known the relation between the involvement of mediastinal and hilar lymph nodes and location of tumor and its histopathological diagnosis. Our aim with this study is to enlighten this case.

Material and Method: Between the dates January 1998 and September 2003, the patients with lung cancer who were operated in Akdeniz University Medical Faculty Hospital Thoracic Surgery Clinic dissected mediastinal lymph nodes are observed in our study.

On these patients involvement of mediastinal lymph nodes and its relation with location of tumor and its histopathology are analysed.

Findings: All patients are treated with lymph node dissection. They are mostly treated with lobectomy and pneumectomy. Practised dissection was a sampling. 110 lymph nodes were dissected by 31 patients included in the study and we detected metastasis in 44 of the lymph nodes.

2.5 lymph nodes are dissected per patient and in avarage, one out of three dissected lymph nodes metastasis is detected.

Conclusion: In this study we did with 31 cases, we gathered all the data. Eventually we came to a conclusion that the histopathological type which makes lymph node metastasis the most is squamous cell carcinoma.In our study we determined that the most frequent source of metastatis is right upper lobe and the station which receives metastasis the most is lymph node station 10 and the most aggressive metastasis is caused by large cell and the most frequent metastasis is caused by the squamous cell carcinoma.

P21-2

A CLINICAL STUDY OF SYNCHRONOUS MULTIPLE LUNG CANCER WITH HETEROGENOUS HISTOLOGICAL TYPES, AN EXPERIENCE OF 13 CASES

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OBJECTIVE
At present, no guidelines on recommendations for the management of synchronous multiple primary lung cancers are available. The histological types of the synchronous multiple primary lung cancers could be heterogeneous, and no report have been published regarding this issue.
We'd like to report a single-institution's experience of management of synchronous multiple primary lung cancers with heterogeneous histological types.
METHODS
This is a retrospective study of synchronous multiple primary lung cancers treated with surgery at our institution from January 2005-October 2012. This study used the secondary data from the medical record. The types of procedures performed, the histopathological results and the follow-up will be presented.
RESULTS
A total of 1381 patients underwent thoracic surgery for lung cancer, January 2005 - October 2012. 13 patients(0.9%) were synchronous multiple primary lung cancers with heterogeneous histological types. The characteristics of the synchronous multiple primary lung cancers were; 10 men and 3 women, with median age was 75.1 years old (range: 61-85). The clinical stage were; IA/ IB/ IIB/ IIIA/ IV in 4/ 3/ 3/ 2/ 1 patients. All patients underwent resection of both lung tumors. Nine synchronous lung tumors were ipsilateral and treated with; 1 pneumonectomy, 2 bi-lobectomy, 2 lobectomy, 3 lobectomy with partial resection and 1 segmentectomy. The bilateral synchronous tumors (4 patients) were treated with 2 lobectomy and segmentectomy on the opposite side, 1 segmentectomy bilaterally and 1 wedge resection. Postoperative histopathologic examination revealed a preponderance of a combination of Adenocarcnima and Squamous Cell Carcinoma. The median postoperative observation period was 14.7 months. 2 cases died due to relapse, while another 8 cases (recurrence 2, disease-free 6) are alive.
CONCLUSIONS
The incidence of synchronous multiple primary lung cancer is low. With an appropriate patient selection process, patients with synchronous multiple primary lung cancer are expected to have benefits from surgery.

P21-3

VOLUMETRIC COMPUTED TOMOGRAPHIC EVALUATION OF PULMONARY FUNCTION IN INDIVIDUAL LOBES BEFORE AND AFTER LOBECTOMY

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Objective

Pulmonary function studies have been performed in thoracotomy patients mainly for the purpose of predicting postoperative morbidity and mortality. Although lobectomy is the standard operative procedure for lung cancer, spirometry cannot evaluate pulmonary function of individual lobe as single units. We evaluated the vital capacity (VC) of individual lobes using volumetric computed tomography in patients before and after lobectomy.

Methods

A total of 31 patients who underwent lobectomy were included in this study. There were 15 males and 16 females, and aged 67±9 years. Chest CT scans at inspiratory and expiratory levels were performed at the same time using 40-slice MDCT (Brilliance 40, Philips, Netherlands), before and after lobectomy. We then calculated the volume of individual lobes using graphic workstation (Virtual Place Lexus 1.0, AZE, Japan). Voxels with -215 HU or less were regarded as the air in the lung. Ventilation of each lobe (VEL) was calculated as lobar volume at the inspiratory level subtracted by lobar volume at the expiratory level. VC in each lobe (VCL) was calculated using following equation.

VCL = VEL*(VC measured by spirometry) / (sum of VEL in all lobes)

Results

VCs measured by spirometry before and after surgery were 3.14±0.98 L and 2.76±0.87 L, respectively. Total VCL of residual lobes in the operated side was 1.01±0.47 L before surgery, and significantly (p=0.0094) increased to 1.22±0.74 L after surgery. Increase in an average of 22.3±43.6% was observed. Total VCL in the unoperated side was almost the same before (1.71±0.71) and after (1.69±0.63 L) surgery.

Conclusions

Volumetric CT appeared applicable for quantitative evaluations of local pulmonary function of individual lobes as single units. Our results revealed that VCL of residual lobe in the operated side increased approximately 20% after lobectomy, and that lobectomy did not affect VCL in the unoperated side.

P21-4

RISK FACTORS FOR RECURRENCE IN PATIENTS WITH PN0 NON-SMALL CELL LUNG CANCER AND A TUMOR DIAMETER OF 20 mm OR LESS

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[OBJECTIVE] To investigate risk factors for recurrence in patients with pN0 non-small cell lung cancer and a tumor diameter of 20 mm or less. [METHODS] A total of 142 consequent patients with pN0 non-small cell lung cancer (NSCLC) and a tumor diameter of 20 mm or less who underwent lobectomy with hilar and mediastinal lymph-node dissection were enrolled. Kaplan-Meier analysis and log-rank tests with 95 % confidence intervals were employed to evaluate the impact of visceral pleural invasion (VPI), lymphovascular invasion (LVI), and other clinicopathological factors on relapse-free survival. Cox proportional hazards models were also applied to assess the risk factors for recurrence. In this study, 7th edition of the TNM staging classification was used. [RESULTS] Seventy-three males, with mean age of 67.1 (36-86) years old. Pathological stage IA:IB = 124:18. Histological classification was as follows; Ad: 121, Sq: 15, Adsq: 3, and large/LCNEC: 3. Median follow-up period was 57.5 (3-132) m. Recurrence was seen in 9 patients. Seven males, pathological stage IA:IB = 5:4, Ad: 6, Sq: 3. Recurrent site were local only in 3, distant only in 4, and both local and distant in 2 patients. In univariate analysis, Sq, positive VPI, positive LVI were risk factors for recurrence. In multivariate analysis, positive LVI was an independent risk factor for relapse-free survival (hazard ratio = 0.081, $P < 0.001$). [CONCLUSIONS] In this single-institutional study, positive LVI was a most important risk factor for recurrence in patients with pN0 non-small cell lung cancer and a tumor diameter of 20 mm or less. The validity of adjuvant chemotherapy for those patients should be investigated in multi-center trials.

P21-5

ANATOMICAL SEGMENTECTOMY OF THE LUNG, WITH SPECIAL REFERENCE TO IDENTIFYING THE INTERSEGMENTAL PLANE

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Objectives: A pulmonary segmentectomy requires identification of the segmental planes, making it technically more difficult than a lobectomy. Therefore, we present a selective segmental-inflation technique using a butterfly needle. This paper discusses anatomical sublobar resection with special reference to identifying the intersegmental plane.

Methods: First, the lung is deflated and the pulmonary vessels to the involved segment are divided. The segmental bronchus is divided using a stapling device or ligation. Then, using a butterfly needle, oxygen/air (0.5 to 1.5 L) is instilled into the targeted bronchus to inflate the involved segment, and the involved segment is severed and removed using electrocautery or a stapling device. The raw surface is covered with an absorbable sealing material to prevent air leaks.

Results: Fifty-three (M:F = 27:26) patients underwent anatomical segmentectomy with the selective segmental-inflation technique using a butterfly needle. Their median age was 67.6 years. The diseases were malignant lung disease in 44 patients and benign lung disease in nine. The surgical procedure was segmentectomy only in 47 and segmentectomy combined with lobectomy in six. The median operating time was 170 min; the blood loss was 100 (slight) to 950 g; and the postoperative stay was 4 days. The duration of chest tube drainage was 3 days. One patient had a minor air leak for 9 days and required treatment for pleural adhesions. No in-hospital mortality occurred.

Conclusions: In summary, anatomical sublobar resection was performed successfully with the selective segmental-inflation technique using a butterfly needle.

Advantages: Surgeons can control every manipulation. No special device is needed; a butterfly needle is sufficient. It is useful regardless of the situation of proximal bronchus. Ultra-selective air instillation into the subsegmental bronchus depends on the needle direction.

Disadvantages: The proximal site of the targeted bronchus must be identified. Care is needed to avoid systemic air embolism.

P21-6

SEGMENTAL RESECTION IN LUNG CANCER WITH GROUND GLASS OPACITY

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Objectives

Recently, lung segmental resection has been increasingly performed. For primary lung cancer, we performed segmentectomy in lung cancer case with pure ground glass opacity (GGO) or more than 50 %GGO and less than 2 cm diameter as a radical segmentectomy (RS), and in case with low lung function, relapse, or high risk condition as a palliative segmentectomy (PS). In this study, we compared RS with PS cases.

Patients and Methods

Of 117 patients who underwent segmentectomy (64men, 53women; mean age, 64.9±12.1years), VATS (Video Assisted Thoracoscopic Surgery) segmentectomy was performed in 72 patients (66.7%). Segmentectomy was performed to remove a primary lung cancer in 65 patients. We performed RS in 32 patients and PS in 41. We performed hilum or mediastinal lymph node resection.

Results

The mean age of RS and PS were 67.2±10.0, 70.7±8.9 years old (p=0.099), respectively. The mean FDG-PET standardized uptake value were 1.19±1.51 7.78±7.34 (p=0.000). The mean operative time were 287±84, 314±111 days (p=0.257).The mean blood loss of were 60±53, 167±288 ml (p=0.025). The mean duration of drainage was 2.7±1.2, 3.4±1.8, days (p=0.073). Postoperative complications related to the operative procedures occurred in 4 (12.5%), 13 cases (31.7%). Five year survival were 100 (mean observation duration: 26.6±20.5 days) , 43.3%(28.5±25.3), respectively.

Conclusion

Our radical segmentctomy is feasible for lung cancer with feature more than 50% GGO.

P21-7

A CASE OF SURGICALLY TREATED SEVEN BILATERAL SYNCHRONOUS LUNG CANCERS

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OBJECTIVE

We report a case of seven bilateral synchronous lung cancers, undergoing video-assisted thoracic surgery.

METHODS

An 84-year-old woman visited the hospital for the further examination of the abnormal shadow on the chest X-ray. CT scans revealed three nodules and four ground glass opacities (GGO). One nodule of 2.2 x 2.1 cm in size and second nodule of 2.0 x 1.8 cm were seen in the right lung. These two nodules showed some uptake of 18F-fluorodeoxy glucose (FDG) by positron emission tomography. The other nodule of 1.8 x 1.8 cm was seen in the left lung without FDG uptake. All GGOs were located in the left lung and they were from 0.7 to 0.9 cm in diameter without FDG uptake. We determined that she would have at least two lung cancers. Both nodules in the right lung were resected by wedge resection. Pathological findings showed one nodule was adenocarcinoma and the other was adenocarcinoma and squamous cell carcinoma. Following eight months after the operation, the nodule and one of four GGOs showed minimal increase in size. We scheduled the resection of one nodule and four GGOs because we supposed all of the GGOs showed highly suspected lung cancers. Each GGO was marked by radiopaque dye injection using CT-guided method not to lose them during the surgery. Five wedge-resections were successfully conducted using fluoroscopy. Pathological findings showed that the resected lesions were all lung cancer of four adenocarcinoma (two mixed type, and two bronchioloalveolar carcinoma) and squamous cell carcinoma.

RESULTS

We resected seven synchronous pulmonary cancers by two operations. She is doing well with no cancer recurrence for two year after the first operation.

CONCLUSIONS

We should remove the other small lesions in the ipsilateral lung when we suspect they are lung cancer.

P21-8

RESECTION OF SYNCHRONOUS LUNG CARCINOMA WITH OLIGOMETASTATIC DISEASE TO THE BRAIN

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The presence of synchronous primary carcinoma of lung is an uncommon condition. A patient was admitted with brain tumour. Excision of the brain tumour was diagnosed as metastatic adenocarcinoma suggesting a primary lung origin. Two primary lung malignancies of different histologic types were diagnosed with a combination of small cell lung carcinoma (SCLC) and adenocarcinoma with ipsilateral LN involvement.

Case Study

Mr. Lim presented with seizures and was diagnosed with a brain tumour which required surgical resection. Pathology being metastatic adenocarcinoma, a lung mass in the right upper lobe was found. Since oligometastatic disease combined with surgical resection of primary has a favourable prognosis, a right upper lobectomy with lymphnode dissection was performed. The histology revealed it to be a synchronus small cell carcinoma and adeno carcinoma & lymphnode were deemed metastatic. Combined modality treatment of brain metastatic has greatly improved the survival of patients with single lesions and good functional performance status. The occurrence of more than one type of lung cancer in a patient is an unusual event; a small proportion of patients with lung cancer developed a second primary tumour.

There is an increasing clinical reality of synchronous primary lung tumours due to the development and application of new visual diagnostic methods in oncology. However, there is a lack of therapeutic guidelines for selection and treatment of such patients. Therefore there is a need for further studies on managing such patients.

Conclusion

The surgical interventions for stage IV NSCLC with oligometastasis were explored and discussed. A better understanding of synchronous primary lung carcinoma is achieved through the findings of the histopathology. Furthermore, lung carcinoma could be a combination of complex histology conditions. Thus, it is important to explore the best choice of treatment based on the individual disease process in order to achieve optimal patient outcome.

P21-9

CONCOMITANT CRITICAL CORONARY ARTERY DISEASE AND NON SMALL CELL LUNG CANCER TREATED BY SIMULTANEOUS CABG AND RIGHT MIDDLE AND LOWER LOBECTOMY: A CASE REPORT

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Concomitant critical coronary artery disease and non-small cell lung cancer (NSCLCa) is a rare occurrence. The management of these patients is subject to debate.

We present a case of a 65 year old man, evaluated for unstable angina and was found to have severe three vessel coronary artery disease with 70% left main stenosis, requiring urgent coronary artery bypass surgery. Preoperative chest x-ray showed an isolated mass in the right lower lobe of the lung.

Traditionally the cardiac surgery is performed first followed by the pulmonary resection at a later date which increases morbidity and cascades deleterious effects on tumor growth and dissemination. Alternatively, the cardiac surgery and the pulmonary resection can be performed simultaneously. Chemotherapy may be used as adjuvant therapy after resection.

P22-1

THE COMPARISION OF IODOPOVIDION AND TALK IN PLEURADESIS OF MALIGNANT AND PERSISTANT PLEURAL EFFUSIONS

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Aim: To compare the safety and efficacy of chemical pleurodesis with talc in 0.9% saline solution and 10% iodopovidone in 0.9% saline solution.

Material and method: The study was desinged in two fields: A prospective clinical investigation and a comperative experimental investigation.

Clinical investigation: Sixteen patients with pleural effusion treated and followed in Thoracic Surgery Clinic in Pamukkale University Hospital were included after tube thoracostomy and chemical pleurodesis with iodopovidone solution was performed to all patients. The effect of pleurodesis was evaluated according to the changes in chest x-rays before and after thoracostomy and thyroid function tests.

Experimental investigation: That part of the study was carried out in the Experimental Studies' Laboratory of Pamukkale University between January and March 2008. In the study approved by Ethical Committe of Pamukkale University, 10 New Zeland white rabbits was divided into two groups. The pleurodesis was performed with talc in 0.9% saline solution in Group I and with 10% iodopovidone in 0.9% saline solution in Group II. The pleural samples were examined pathologically both in microscopic and macroscopic methods.

Results:

Clinical examination: The success rate of pleurodesis was 87% in the patient group. Serum T3 hormone levels were found decreased subclinically. But this situation are not related with iodopovidone application.

Experimental investigation: The grade of adhesion was better in talc pleurodesis group while the distrubition was more diffuse in iodopovidone pleurodesis group. No changes in thyroid function tests in both rabit groups were occured.

Conclusion: The iodopovidone solution is a safe, effective, easily available and cheap choice for pleurodesis.

P22-2

TRIMODALITY THERAPY WITH EXTRAPLEURAL PNEUMONECTOMY, RADIATION, AND CHEMOTHERAPY FOR MALIGNANT PLEURAL MESOTHELIOMA

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Objectives: Our experience of trimodality therapy with extrapleural pneumonectomy (EPP), radiation, and chemotherapy for malignant pleural mesothelioma (MPM) is reported.

Patients and Methods: Thirty-four EPP were completed in our hospital between June 2006 and October 2012. Thirty consecutive EPP for MPM which were performed by the first author's team were reviewed retrospectively. Twenty-four patients have been treated with EPP, adjuvant hemithoracic radiation, and adjuvant cisplatin-based chemotherapy. Six patients were given induction chemotherapy with CDDP and PEM, and referred to us. They underwent EPP and adjuvant radiation. Overall survival was calculated using the Kaplan-Meier method.

Results: The median age at EPP was 61 years old. There were 23 males and 7 females. The right side was affected in 16 and the left side in 14. The epithelioid was present in 20, biphasic in 6, sarcomatous in 2, and others in 2. The median EPP time was 7 hours 32 minutes. No blood transfusion during EPP was needed in 13 cases (43%). Mortality involved one patient (3.3%), who died on post-operative day 14 due to the acute aggravation of interstitial pneumonia. Fourteen patients (47%) had perioperative complications. Atrial fibrillation was the most common morbidity, and developed in nine patients (30%). The IMIG pathological stage was stage IV in 1, stage III in 18, stage II in 4, and stage I in 7. Adjuvant hemithoracic radiation was completed in 25 patients (86%). Nineteen patients (66%) underwent trimodality therapy. The three-year survival, two-year survival, and median survival of all thirty patients were 27%, 37%, and 16 months, respectively. The three-year survival, two-year survival, and median survival of nineteen patients who underwent trimodality therapy were 37%, 52%, and 30 months, respectively.

Conclusions: Trimodality therapy with EPP, radiation, and chemotherapy for MPM is feasible. However, the prognosis of MPM patients should be quickly and markedly improved.

P22-3

VALIDITY OF SURGICAL RESECTION IN BREAST CANCER PATIENTS WITH AN ABNORMAL SHADOW ON CHEST CT

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Objective: An abnormal shadow on chest computed tomography (CT) in breast cancer patients requires urgent investigation to establish whether it is a metastasis, as this is crucial in determining treatment. In this study, we assessed the validity of surgical resection for an abnormal chest CT shadow in breast cancer patients.

Methods: We retrospectively analyzed 9 female patients with breast cancer who underwent surgical resection for a newly discovered, abnormal chest CT shadow between January 2010 and November 2012.

Results: The mean patient age was 59 years (range, 33-65 years) at the time of surgical resection for the suspected pulmonary lesion. In 2 patients, an abnormal shadow on chest CT was found synchronously with the breast cancer diagnosis. Chest CT showed a solitary pulmonary nodule in 6 of the patients, 2 nodules in 1 patient, and of the other 2, one had a solitary nodule and mediastinal lymph node swelling, and the other had hilar and mediastinal lymph node swelling. Six preoperative bronchoscopies were performed, 3 of which resulted in a diagnosis (2 adenocarcinomas and 1 class IV disease). Four patients who underwent FDG-PET showed FDG uptake, 3 as a result of metastasis from breast cancer and 1 due to a primary lung cancer. Video-assisted thoracoscopic surgery was performed for 6 patients, 5 of whom underwent a partial resection and 1 a mediastinal lymph node biopsy. A thoracotomy (lobectomy) was performed for 3 patients. In total, there were 6 pulmonary metastasis from breast cancer and 3 primary lung cancers (1 stage IA and 2 stage IIIA; 1 squamous cell carcinoma and 2 adenocarcinomas).

Conclusion: In breast cancer patients, surgical resection for an abnormal chest CT shadow appears feasible and valid because 33% of the patients had primary lung cancer.

P22-4

CLINICAL OUTCOME OF SURGICAL TREATMENT FOR PULUMONARY METASTASIS OF NON-SEMINOMA

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[Objective] Our institute is one of the high volume centers of testicular cancer in Japan, so there are many opportunities to excise pulmonary metastasis of testicular cancer. It is a standard treatment for advanced testicular cancer to excise a residual focus including pulmonary metastatic region after performing chemotherapy until tumor markers carries out the shade conversion. [Methods] From April 1995 to December 2011, 39 Cases of testicular cancer with lung metastasis underwent lung resections after tumor marker (α-fetoprotein) got normalization. Two cases were extragonadal germ cell tumor. Although the both-sided operation was conducted by median sternotomy and the single-sided operation also was underwent by anterolateral thoracotomy so that we can find pulmonary regions by palpation until December 2007, lipiodol marking of small resions under computed tomography allows us to perform thoracoscopic pulmonary resections from December 2007. [Results] Lipiodol marking was performed on an average of 2.9 places by one operation. It is eighteen examples that survival of the cell viable to the excised lung pathological change was accepted. The example of operation death is only one case by the complications at the time of retroperitoneal lymph node dissection, and, as for the five-year probability of survival was 92.6%. Moreover, the minimum residual viable tumors were 2 mm in major axis, and it suggests that the necessity of excision is not decided in size. For this reason, marking should be actively performed to the minute regions. [Conclusions] It is important that lung metastatic residual lesions of testicular cancer are completely resected.

P22-5

SECOND PRIMARY LUNG CANCER WITH LUNG METASTASIS FROM LARYNGEAL CANCER : A CASE REPORT

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OBJECTIVE: Because of common etiological factors such as tobacco and alcohol, patients with head and neck cancer are at risk for developing second primary malignancies at a rate of 4-7% per year. The lung is the most common site for the development of a second primary tumor after head and neck cancer. We report a case of second primary lung cancer with lung metastasis from laryngeal cancer.

METHODS: A 63-year-old man, who was diagnosed as laryngeal cancer (T3N1M0) and underwent total laryngectomy and neck dissection followed by adjuvant chemoradiotherapy 25 months before, was referred to our department because of an abnormal shadow on his chest X-ray. Chest computed tomography revealed a 30-mm, well-defined and lobulated mass in the left upper lobe (S^{1+2}) and a 10-mm peripheral nodule in the left lower lobe (S^{9}). The result of transbronchial lung biopsy of the mass in S^{1+2} was squamous cell carcinoma. We suspected the mass in S^{1+2} to be primary lung cancer rather than metastasis from laryngeal cancer. In consideration of the possibility of primary lung cancer, we performed left upper lobectomy with ND2a. The nodule in S^{9} was resected with wedge resection.

RESULTS: Pathologically, the mass was well-differentiated squamous cell carcinoma compatible with the previous laryngeal cancer, and the nodule was bronchioloalveolar carcinoma. These tumors were diagnosed as metastasis from laryngeal cancer and second primary lung cancer. Twenty-seven months after the first pulmonary resection, lung metastasis of laryngeal cancer appeared in the right lung and pulmonary metastatectomy was performed. Finally, 26 months after the second pulmonary resection, the patient died of hypopharynx cancer and recurrent lung cancer.

CONCLUSIONS: We should pay attention to multiple primary malignancies of patients with laryngeal cancer and develop a treatment strategy for pulmonary nodules.

P22-6

LYMPHOEPITHELIOMA LIKE CARCINOMA OF THE THYMUS: A CASE REPORT

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OBJECTIVE: Lymphoepithelial-like carcinoma (LELC) is known for histological similarity to undifferentiated nasopharyngeal lymphoepithelioma, and can arise in the salivary gland, thymus, lung, stomach, and skin. LELC of the thymus is a rare subtype of thymic carcinoma with poor prognosis. We present a case of LELC arising in the thymus with surgical resection. METHODS: The case is a 62 years old woman with superior mediastinum mass in medical treatment for rheumatoid arthritis. It tended to increase for follow-up, and she was examined us for introduction. Chest computed tomography (CT) scans showed a 2.5-cm sized mass located in superior mediastinum and it was close to brachiocephalic artery on the right of the mass. Positron emission tomography by fluorodeoxyglucose (FDG) showed the mass had been positive. It was diagnosed as squamous cell carcinoma as a result of CT-guided percutaneous biopsy. We performed extended thymectomy for thymic cancer. The operative time was 278 minutes, and bleeding was 96 g. It was good course after operation to discharge. Result: Pathologically, the tumor composed atypical cells with large nuclei and eosinophilic cytoplasm of forming solid syncytia on a background of lymphocytes, and was negative for CD5, synaptophysin, chromogranin A. It was diagnosed as LELC of the thymus. She is well without a recurrence after in progress as of six months after operation. CONCLUSIONS: LELC is a subtype of thymic carcinoma, and is classified as high grade malignant of thymic carcinoma. And the mainstay of the treatment is surgical resection. We can perform complete resection the tumor, but it is necessary for carefully follow-up.

P22-7

USEFULNESS OF THE ENSEAL INSTRUMENT FOR LUNG CANCER SURGERY

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Objectives: EnSeal is a new bipolar instrument approved by the US Food and Drug Administration. However, the use of this new device has not expanded appreciably in the field of general thoracic surgery. Therefore, we investigated the usefulness of the EnSeal instrument for lung cancer surgery in this study.

Methods: For the 109 selected cases between February 2010 and October 2011 in our department, we reviewed the perioperative data including patient age and gender, operation time, surgical procedure, degree of lymphadenectomy, pathological staging. The EnSeal was used for various surgical procedures, including vessel or lymphatic sealing.

Results: The patients comprised 75 men and 34 women, ranging in age from 37 to 89 years (mean, 71.2±7.7 years). The surgical procedures employed were pneumonectomy in 1 patient, bilobectomy in 5, lobectomy in 81, segmentectomy in 5, wedge resection in 16, and left main bronchial resection without removal of lung parenchyma in 1. ND2a was performed in the patients who underwent pneumonectomy, bilobectomy, and lobectomy. ND0 or ND1 was performed in the patients who underwent segmentectomy, wedge resection, and left main bronchial resection.

The mean total operation time was 172 ±75 min. Pathological staging was IA in 49 patients, IB in 19, IIA in 10, IIB in 7, IIIA in 21, IIIB in 2, and IV in 1.

No intra- or postoperative bleeding due to failure of sealing with the EnSeal instrument was observed in any of the patients. There were no episodes of postoperative leakage of lymphatic fluid and its resulting sequelae, or any perioperative intrathoracic nerve or vascular injuries caused by collateral thermal spread.

Conclusions: The EnSeal facilitates strong, reliable and safe sealing without collateral injury, making it useful for pulmonary resection of lung cancer.

P22-8

REPORT OF A CASE: SUCCESSFUL TREATMENT FOR EMPYEMA OCCURRING IN LONG-TERM FOLLOW UP PERIOD IN PATIENT UNDERWENT EXTRAPLEURAL PNEUMONECTOMY FOR MALIGNANT MESOTHERIOMA

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To our knowledge, this is the first report to treat empyema succesfully in a conservative method, which occurred in long-term follow up period in patient underwent extrapleural pneumonectomy for malignant mesotherioma. A 58-year-old man underwent tri-modality therapy for the right malignant mesothelioma. After 18 months, he complained of right chest pain and high fever. In the physical examination, we found his right chest wall was reddish and swelling. We diagnosed empyema by thoracocentesis, and started closed drainage. The phlogogenic fungus was beta-lactamase positive, coagulase negative Staphylococcus. As there was no sign of a bronchial fistula, we began to wash the thoracic cavity by saline of 2L a day through the drainage tube, and administered urokinase into the thoracic cavity intermittently. On the 25th hospital day, we did thoracoscopic thoracotomy under local anesthesia, and found lots of fibrin was remained and yellow collared pus was adhered on the Gore-Tex meshes on the sites of the pericardium and the diaphragm replacement. We continued the washing and administration of urokinase. On the 37th day, we performed the purification of empyema under general anesthesia, but didn't remove the Gore-Tex meshes. On the 44th day, we administered antibiotics into the thoracic cavity. We confirmed no residual bacteria in the cavity on the 57th day, and we finished the drainage. The next day the patient discharged. Two months after this treatment, there was no sign of relapse in the blood exam and chest CT. Four months later, the patient suffered from pneumonia caused by viral infection, and died of acute respiratory distress syndrome. Autopsy revealed that empyema was cured and the bronchial stump was strongly covered with a intercostal muscle and hypertrophic connective tissue without fistula. In the right thoracic cavity there was no recurrence of malignant mesothelioma, while malignant mesothelioma was appearedbut in the left.

P22-9

AGGRESSIVE NEUROECTODERMAL TUMOR OF THE LEFT CHEST WALL TREATED WITH CHEMOTHERAPY AND VERY EXTENSIVE SURGICAL RESECTION: A CASE REPORT

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Primitive neuroectodermal tumors (PNET) are extremely uncommon, malignant neoplasms affecting mostly children. They tend to be locally invasive and can metastasize to lymph nodes, adrenals and liver. Recurrence is common, usually occurring at the original site. The treatment for PNETs includes radical resection with wide margins, supplemented with radiotherapy and aggressive chemotherapy. We have reviewed a case of an 11-year old child with an aggressive tumor of the antero-lateral chest wall. A surgical resection was planned and successfully completed with negative surgical margins. The tumor recurred within 3-months of the resection and eventually led to his demise.

P22-10

DIFFUSE LARGE B-CELL LYMPHOMA PRESENTING SOLELY AS A LARGE RIGHT CHEST WALL MASS: A CASE REPORT

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Malignant primary chest wall lymphoma is a rare group of primary tumors. They rarely if ever present as a solitary mass with chest wall as the only site of localization. We present a case of an elderly lady diagnosed with Diffuse Large B-cell Lymphoma presenting as a single chest wall mass and no other systemic symptoms. CNOP (cyclophosphamide, novantrone/mitoxantrone, vincristine and prednisolone) was planned. Unfortunately she was lost to follow up after the first cycle. This case signifies that Diffuse Large B-cell Lymphoma (Non-Hodgkin Lymphoma) should be included in the differentials for a solitary chest wall mass presenting with chest pain. It can be detected by radiography and the origin is confirmed by biopsy. Chemotherapy, CHOP (cyclophosphamide, hydroxydaunorubicin/adriamycin, Oncovin/vincristine and prednisone/prednisolone) or CNOP, is recommended after it is proven by biopsy especially when the tumor is large.

P22-11

LYMPHANGIOMA OF THE NECK AND MEDIASTINUM PRESENTING WITH STRIDOR IN A 12 YEAR OLD CHILD AND ITS SUCCESSFUL RESECTION: REPORT OF A CASE

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Lymphangiomas are congenital malformations of lymph tissue that result from the failure of lymph spaces to connect to the rest of the lymphatic system. This benign condition is generally found in the neck region and is discovered by 2 years of age. We report the case of an 11-year-old child who presented with a cervical and mediastinal cystic hygroma that was large enough to cause shifting of the trachea and required a thorough investigation. The entire mass was successfully resected with a lower neck incision and the patient is without any signs of recurrence 6 months after surgery.

We report a rare case of a 12-year-old child with a large lymphangioma in the neck and upper mediastinum causing compression of the mid and lower trachea. Surgical resection was done and patient was discharged without any complications. Our case suggests the need to consider cystic lymphangioma in the differential diagnosis of lateral neck masses, together with adequate imaging to substantiate the preoperative diagnosis.