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Ventricular septal defect and aortic regurgitation: AV repair using leaflet extension
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Abstract
It is not uncommon to see children who have been followed up for small subpulmonic ventricular septal defects develop moderate to severe aortic regurgitation. The repair has to be tailored to the aortic valve pathology. We propose leaflet extension as a reproducible technique in which prolapse of the valve is associated with retraction reducing the geometric height of the leaflets.

Methods
3 patients with severe AR with VSD were repaired by using a single leaflet extension technique using autologous glutaraldehyde fixed pericardium (0.6% for 10 minutes followed by 18 minutes washing for 3 times each for 6 min duration). All three had moderate to severe AR requiring ostial plegia for cardiac arrest. The prolapsed free margin was extended using glutaraldehyde fixed pericardium using 7-0 prolene sutures and the commissure was resuspended on either side using a separate 6-0 prolene pledgetted suture fixed outside the aortic wall.

Results
All three had no aortic regurgitation at the end of the procedure. The period of follow up is from one month to one year. The immediate postoperative and early follow up results have been good with no aortic regurgitation developing.

Conclusion
Early results of leaflet extension which is built up on the principle of single leaflet Ozaki reconstruction has been good. Too much redundancy of the leaflet needs to be avoided to avoid buckling and obstruction to coronary ostia. Longer-term follow up is necessary to assess the durability of this repair technique.

Use of near-infrared spectroscopy for monitoring distal limb perfusion in patients on IABP
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Abstract
The application of near-infrared spectroscopy (NIRS) in patients undergoing cardiopulmonary bypass for the purpose of monitoring cerebral perfusion is well known. There have been only a few reports of its use in adult patients undergoing peripheral veno-arterial extracorporeal membrane oxygenation to monitor lower limb perfusion.

Aim and Objective
Our study aimed to understand the usefulness of NIRS monitoring for the early detection of reduced distal limb perfusion in patients who were placed on intra-aortic balloon pump (IABP) through femoral artery.

Materials and Methods
We prospectively studied the use of NIRS monitoring for the early detection of reduced distal limb perfusion in 36 adult patients, who were supported with IABP between 2018 and 2019 (NIRS group). The decision to reinsert the IABP in the contralateral lower limb was made based on the NIRS system’s regional oxygen saturation (rSO2) values. To compare outcomes, the medical records of 45 adult patients who had previously received IABP without NIRS monitoring (control group) between 2017 and 2018 were reviewed retrospectively. Institutional Ethical Committee Approval was taken ref. no. IEC/39/18 dated January 22, 2018.

Results
There was no significant difference between the frequency of reinsertion of IABP in the contralateral lower limb in both groups (P = 0.414). The mean time to reinsertion of IABP in the contralateral lower limb is shorter in the NIRS group (20.6 ± 21.4 vs. 40.0 ± 61.0 h). In the NIRS group, no patients underwent fasciotomy, whereas 13.5% did in the control group (P = 0.030).

Conclusion
We believe that NIRS monitoring is an effective and accurate approach for detecting limb ischemia in IABP patients. Its use could lead to the early correction of perfusion deficits, as well as the avoidance of compartment syndrome and limb problems.

Use of Modified Eloesser Flap in the Management of Complicated Empyema Thoracis
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Abstract
Empyema (from Greek meaning “abscess”) is the collection of pus within pleural cavity. The management of empyema involves adequate drainage of the pus and obliteration of the pleural space. Management options for complicated empyema include intercostal tube drainage, decortication, thoracoplasty or modified Eloesser flap. Modified Eloesser flap, more commonly known as the Window procedure is reserved for patients in whom the underlying lung beneath the empyema is too diseased to be decorticated and patients with large cavity are not candidates for thoracoplasty.

Method
Aim is to study and project the effectiveness of modified Eloesser flap procedure as a valuable treatment option in management of complicated empyema thoracis when indicated. A database of all
the patients who undergo surgical treatment for empyema thoracis is maintained in the institution. From this live database, the details of all patients who underwent the window procedure over the last 8 years were retrieved and studied.

The mode of presentation, symptomatology, indications for surgery, co-morbid conditions, microbiological cultures, duration of hospital stay and follow up details were analyzed.

**Results**

Four patients required their window to be refashioned and two patients opted to have elective window closure. Post operatively, Gram negative organisms especially pseudomonas were the most common pyogenic organism. 20% of the biopsies were confirmatory for tuberculosis, but only 65% of the mycobacterial cultures were positive. The mean hospital stay postoperatively was 7 days and the average follow up was for 12 months. Most windows healed by 6 to 9 months.

**Conclusion**

Eloesser procedure is invaluable armamentarium in treating patients with empyema who are very sick, septic and moribund, especially where the underlying lung is too diseased for decortication. These sick patients may not tolerate major procedure like a decortication or thoracoplasty. When pleural empyema complicates lung resection surgeries, modified Eloesser flap continues to be an easy and definitive surgical option. It gives immediate relief of symptoms of empyema and avoids the complications of prolonged tube drainage. Patient compliance is good.

**Uniporal VATS Single Institution Experience**

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**Abstract**

**Aim**
The evolution of video technology and instrumentation have revolutionised the way lung resections and Thoracic Surgical procedures are performed without compromising outcomes. Diego Gonzales-Rivas popularised Uniporal video assisted thoracoscopic surgery (U-VATS).

**Objective**
To highlight development of U-VATS in a Single Thoracic Surgical Unit.

**Methodology**
Surgery with U-VATS was started in 2017 in our unit, before that we were using two port technique since 2010. We started U-VATS with decortications for early empyema, wedge resections, bullectomies, and anatomical lung resection (Lobectomy, Segmentectomy). Recently we are able to do bronchial sleeve resection. We combine U-VATS and all our thoracic surgical procedures with Enhanced recovery after surgery (ERAS) protocol.

**Results**

A retrospective review of records of patients who underwent Uniporal procedures from Jan 2019 to October 2021 in our practice was done. Total number of 270 U-VATS were performed with most common procedures being U-VATS Decortications (45.5%) followed by Lobectomy (19%), Bullectomy (11%), Mediastinal mass excision (7%) and wedge resections of the lung (7%), Thymectomy (2%), Anatomical Segmentectomy (2%). Conversion to open surgery was 12 (5%). Comparing the year 2019 and 2021, there was significant improvement with Hand eye coordination, instrumentation which reflected on lesser operative time, blood loss and duration of drain, length of hospital stay and the pain score of the patient.

**Conclusion**

Uniporal VATS did not have a steep learning curve like two port VATS. Uniporal VATS was easier to adopt as the camera and the instruments were through the same port resembling an open surgical procedure. Learning procedure U-VATS must be in stepwise manner. Patients’ safety and oncological principles must always be adhered to in any form of surgery.

**Truncus arteriosus: a technique of using autologous tissue to tailor the proximal trunk to distal aorta**

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Abstract

Background

The principle of truncus arteriosus repair is to separate the systemic and pulmonary circulation and use a valved conduit to establish the right ventricle(RV) to pulmonary artery (PA) continuity and to close the VSD in a way to direct the truncal valve to the left ventricle. Non conduit repairs have been described by bringing the pulmonary artery anteriorly by performing a Lecompte maneuver and establishing a direct RV to PA continuity. During this process the anterior portion of the truncus needs to be excised to prevent compression of the PA which are brought anteriorly. We describe a technique to do this which will not only reduce the length of the anterior wall but also help in tailoring the proximal trunk to the distal aorta.

Method

3 patients with truncus were managed this way. After incising the anterior part of the truncal artery at the level of upper level of pulmonary artery take off, the pulmonary arteries are excised from the trunk and mobilized extensively. The anterior part of the truncal wall is folded over and sutured to the gap created by excision of the pulmonary artery thus completely closing the proximal trunk. The distal aorta is mobilized and an incision is made on the closed trunk to anastomose to the distal aorta. This also eases the tailoring of the dilated proximal portion to the narrow distal aorta and helps in displacing the anastomosis posteriorly facilitating the anterior translocation of the pulmonary arteries.

Results

Using this technique total autologous reconstruction of the systemic artery was obtained. In one, 3kg, 4month old non conduit repair of RV PA was obtained and in the other two 7 month and 2 years old and, one was Van Praagh type 2 and one type 3 (with interruption) RV PA continuity was established using 18 and 16 sized valved PTFE conduit respectively. There was no truncal regurgitation pre and post procedure continuity was established using 18 and 16 sized valved PTFE conduit and no early mortality in this small group of patients.

Conclusion

The additional material provided by the dilated proximal trunk can be fruitfully utilized to provide hemostatic autologous reconstruction in the repair of truncus arteriosus in neonates and small infants.

Transhiatal esophagectomy in carcinoma oesophagus in a high volume centre - a single surgeon experience

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Abstract

Background

Patients with histopathologically proven carcinoma oesophagus were studied retrospectively and prospectively to determine the role of transhiatal esophagectomy and its various aspects including complications.

Methods

805 patients documented to have oesophageal carcinoma from August 1998 to October 2021 with or without neoadjuvant chemotherapy, underwent transhiatal esophagectomy. Procedure was done by a single surgeon using stomach as the substitute with cervical oesophago gastric anastomosis.

Results

805 THEs were performed between 1998 and 2021-315 between 1998 and 2011 and 490 from 2012 to 2021. Around 48% patients had carcinoma of the middle-third of the esophagus while 35% patients had carcinoma of lower-third esophagus. Most of our patients had squamous cell carcinoma (59 %) followed by adenocarcinoma (34%). Major complications included respiratory complications ,11%, significant hemorrhage,9%, anastomotic leak ,7%, perioperative cardiac arrhythmias,6.5%, wound infection/ dehiscence, 4.5%, recurrent laryngeal nerve paralysis and chylothorax, 4% each. Overall mortality was less than 4%. Estimated 3-year disease free survival (DFS)was 30.27%, whereas overall survival (OS) was 40.24%. Also, the estimated 5-year DFS rate was 20.60%, whereas OS rate was 28.42%.

Conclusion

Transhiatal esophagectomy in patients of carcinoma oesophagus offers a viable surgical option, especially in experienced hands, at an acceptable risk with minimal morbidity and mortality among the carefully selected patients. This experience reinforces the value of consistent technique and management in managing these high acuity esophageal patients.

To study warm blood perfusion as a novel way of myocardial perfusion in cardiac surgery with biochemical correlation in beating heart with cross clamp on as compared with arrested heart in adults.

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Abstract

Patients and methods

From September 2011 to November 2016, 25 patients underwent ASD repair on beating heart with continuous antegrade normothermic blood perfusion with aortic cross clamp on. An equal number of patients were subjected to ASD repair on arrested heart. Patients’ age and size of defect were similar in both the groups. Preoperative diagnosis was established by 2D echo and color Doppler study. The normothermic perfusion was kept at 4-5 ml/kg(Body-Weight)/min in the beating heart group.

Results

The mean aortic cross clamp time in the beating heart and arrested heart group were 20.72±7.08 and 30.56±5.83 minutes respectively. The mean bypass time in the beating heart and arrested heart group were 32.80±7.48 and 47.12±6.28 minutes respectively. There were no differences in blood products transfused. ICU and hospital stay were significantly less in beating heart group. There was no hospital mortality in either group, and no statistically significant difference was detected in CPK-MB and Troponin–I levels. No major complications were observed during hospital stay. All patients were successfully discharged. Post operative echocardiography showed normal LV function and no residual shunt in either group.

Conclusion

Beating heart surgery using normothermic blood is a safe and effective technique for the closure of ostium secundum ASD. The heart is operating under more physiological conditions. One can evaluate the severity of any associated mitral or tricuspid valvular insufficiency and identify iatrogenic conduction injuries.

Thoracoplasty Following Thoracostoma: Impact on Pulmonary Function Tests In The Postoperative Period

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Abstract

Background
The purpose of this study is to assess the alteration in lung function postoperatively after thoracoplasty in patients of chronic persistent empyema not resolved by conservative management.

Materials and Methods
20 consecutive empyema patients were taken from July 2018 to Jan 2020. PFTs were done preoperatively and postoperatively on 1 week, 1 month, 2 months and 6 months. Breath holding test (BHT) and 6MWT (Six Minute Walk Test): Preoperatively and Postoperatively on 1 month, 2 months and 6 months.

Results
20 patients enrolled; 18 male and 2 female. Mean Age: 36.8±12 years. Mean BMI 20.12±2.15 kg/m2. 60% Right and 40% left Thoracoplasty Resected ribs: 7 (45%) 6 (25%), 5 (15%) and 8 (15%) First rib was resected in 4 (20%) patients. No significant change in ABG (Arterial Blood Gas) parameters or BHT was observed at 6 months as compared to preoperative values. The mean percent predicted loss in 6MWT at 6 months is 2.5% (0.17) as compared to preoperative value. No statistically significant correlation was observed between PFT and age as well as number of ribs resected and PFT parameters.

Conclusion
The loss in pulmonary function tests after thoracoplasty improved adequately at 6 months after surgery. Complete collapse of empyema space, healing of bronchopleural fistula and closure of OWT (open window thoracostomy) sinuses were observed after surgery. Since our sample size is small, studies with larger number of patients are needed to further analyze the pulmonary function variation following thoracoplasty.

The outcome of lung resection surgeries and tolerance for reduced lung volume with hemodynamic alterations.
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Abstract
Introduction
The outcome of lung resection surgeries depends on patients’ tolerance for reduced lung volume and hemodynamic alterations. The present study aimed to investigate the changes in blood gases and hemodynamic parameters in patients undergoing lung resection surgery and the associated clinical implications.

Material and Methods
This study included 25 candidates for lung resection surgery. After thoracotomy, the isolation of pulmonary artery (PA) and veins was performed as usual. Blood samples were taken from the PA and radial artery simultaneously before PA clamping, as well as 5 and 20 min after clamping the PA. The systemic and PA pressures were also measured. All patients were followed up, and arterial blood gas and pulmonary function tests were performed 3-6 months after the surgery.

Results
Cough (56%) and hemoptysis (56%) were the most common symptoms. Squamous cell carcinoma (56%) was identified as the most prevalent pathology. Lobectomy was the most common procedure performed on the patients. No change was observed in blood gases before and after the clamping of the PA. There was a significant increase in the mean PA pressure (P<0.001), while the mean arterial pressure showed no significant change (P=0.457). The patients with a pre-operative partial pressure of carbon dioxide (PCO2) of > 45 mmHg had more postoperative complications than those with a PCO2 of ≤ 45 mmHg (P=0.047).

Conclusion
Given the lack of any significant changes in the PCO2 and oxygen saturation following the lung resection surgery, it seems that this parameter is not a limiting factor for deciding on operability in patients with lung lesions having an acceptable preoperative partial pressure of oxygen. However, the patients with a PCO2 of > 45 mmHg should be categorized as a high-risk group since they have significantly higher postoperative complications/morbidity.

Aortic valve replacement with the uniline pericardial bioprosthesis: mid-term results in multicenter study
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**Federal State Budgetary Institution “National Medical Research Center named after Academician E. N. Meshalkin” of the Ministry of Health of the Russian Federation

Abstract
Objective
To analyze the immediate results (3 years) of surgical treatment of aortic valve diseases with the use of an epoxy-treated valve of a new generation of xenopericardial semi-frame prosthesis “Tiara” (CJSC “NeoKor”, Kemerovo).

Material and methods
From 2012 to December 2021, n=66 “Tiara” half-frame prostheses were implanted in two cardiac surgery clinics in Siberia for aortic valve diseases. The average age of the patients was 68.2±4.8 years. Women 66.7%. In addition to aortic valve replacement, 25 patients (37.9%) underwent concomitant cardiac intervention, mainly direct myocardial revascularization (n= 13; 19.7%).

Due to the fact that the main proportion (92.4%) of patients were operated on in 2019-2021, the average duration and volume of follow-up were 2.14± 2.1 years and 140.9 patient-years, respectively.

Results
30-day mortality rate was 1.5% (n=1). The lethal outcome was due to the development of myocardial infarction in the area of thrombosis of the shunt to the PNA.

Both cases of non-structural dysfunction of the Tiara prosthesis were associated with the formation of a paraprosthesis fistula and were successfully operated on within 6 months and 4.8 years. The linearized rate of dysfunctions and reoperations was 1.4%/patient-years, respectively. The linearized rate of hemorrhagic complications was 0.71%/patient-years. The linearized rate of non-structural dysfunction of the Tiara prosthesis was 1.4%/patient-years, respectively. The linearized rate of hemorrhagic complications was 0.71%/patient-years (n=1). The lethal outcome was due to sudden cardiac arrest (n=1). The linearized cardiac mortality rate was 0.71%/patient-years.

There were no non-structural dysfunction of the Tiara prosthesis that were associated with the formation of a paraprosthesis fistula and were successfully operated on within 6 months and 4.8 years. The linearized rate of dysfunctions and reoperations was 1.4%/patient-years, respectively. The linearized rate of hemorrhagic complications was 0.71%/patient-years (n=1). The lethal outcome was due to sudden cardiac arrest (n=1). The linearized cardiac mortality rate was 0.71%/patient-years. There were no non-structural dysfunction of the Tiara prosthesis that were associated with the formation of a paraprosthesis fistula and were successfully operated on within 6 months and 4.8 years. The linearized rate of dysfunctions and reoperations was 1.4%/patient-years, respectively. The linearized rate of hemorrhagic complications was 0.71%/patient-years (n=1). The lethal outcome was due to sudden cardiac arrest (n=1). The linearized cardiac mortality rate was 0.71%/patient-years.

Conclusion
Implantation of a semi-frame prosthesis “Tiara” provides high rates of 30-day mortality and immediate survival, low risk of structural dysfunction and low risk of anticoagulant-associated complications.

Implantation of a semi-frame prosthesis “Tiara” provides high rates of 30-day mortality and immediate survival, low risk of structural dysfunction and low risk of anticoagulant-associated complications.
The Tiara prosthesis in vivo has optimal hemodynamic characteristics that provide a significant regression of LV myocardial hypertrophy with in the first 14 days after aortic valve replacement.

The effect of tranexamic acid in off pump coronary artery bypass grafting – scenario in north coastal Chennai.
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Abstract
AIMS AND OBJECTIVES
To assess the efficacy and safety of tranexamic acid (TA) in off-pump coronary artery bypass (OPCAB) surgery.
MATERIALS AND METHODS
This is a prospective descriptive study from January 2021 to November 2021 at Government Stanley Medical College and Hospital, Chennai. Study included 40 patients with Coronary Artery disease requiring off pump coronary artery bypass surgery. Data was collected from Cardiothoracic surgery department, Stanley Government Hospital. All the patients underwent Off Pump CABG.
Patients were randomly assigned to two groups as Group A and Group B. Group A received 2 doses of Inj. tranexamic acid 500 mg, one at the time of induction and another after the reversal of heparinisation. Group B didn’t receive any dose of tranexamic acid. Blood loss was determined with the postoperative drain volume, the hematocrit values, the number of transfusions needed, postoperative re-exploration for massive bleeding and for the post-operative thrombotic complications.

RESULTS
Out of the 40 patients who underwent off pump CABG, 30 were males 10 were females. Patients were divided into two groups of 20 each. Group A received 2 doses of inj tranexamic acid, while Group B didn’t receive any antifibrinolytics. The mean age of presentation was 54.9 years. The average LVEF was 49.5%. The mean LVEF in group A was 51.1% and in group B it was 47.9%. Among the group with tranexamic acid the average volume of drain was 260 ml on the first postoperative day while the highest was 550 ml and among the group B the average volume of drain was 470 ml, while the highest drain volume was 750 ml over 24 hour period. The average hematocrit in the immediate postoperative period was 27.8 in the Group A and 24.4 in group B. None of the patients had re-exploration in the post-operative period. In the first 12 hours after surgery, in group A 9 out of 20 patients had homologous red cell transfusions; while in group B, 14 needed blood product transfusions. None of the patients reported seizure episodes, thrombotic episodes in the form of stroke, or pulmonary thromboembolism.

CONCLUSION
Tranexamic acid reduced the probability of receiving a PRBCs and FFP transfusion during OPCAB surgery. No association with postoperative death and thrombotic events was found in our study.

Tetralogy of Fallot with Aneurysmal Ascending Aorta
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Abstract
Keywords: TOF, Ascending Aorta Aneurysm, Bentall with ICR

Introduction-
Tetralogy of Fallot is a cyanotic congenital heart disease characterised by a tetrad of four anomalies including right ventricular hypertrophy, ventricular septal defect, pulmonary stenosis and over-riding of aorta with high incidence of infant and early childhood mortality. Most cases require treatment in infancy and are symptomatic early on. Rare cases of survival to middle age have been reported.
Abnormalities in the aorta of patients with tetralogy of Fallot can lead to Aortic Dilatation and aortic valve incompetence. TOF patients also carries high risk for the development of infective endocarditis.

Case Report –
We report a case of 23 yr. old cyanotic male patient having Tetralogy of Fallot along with Dysplastic aortic valve, moderate to severe aortic regurgitation, vegetations on all aortic valve leaflets and aortic aneurysm involving aortic root and ascending aorta, who underwent Bentall Procedure along with Intra cardiac repair for TOF. Patient presented with symptoms of chest discomfort, dyspnea, chest pain, tachycardia. On 2D echo Perimembranous VSD of size 16-18mm (L-R shunt), Aortic overriding, Severe Infundibular Pulmonary stenosis, Moderate Aortic Regurgitation was found. On HRCT Thorax Cardiomegaly with Dilated Ascending Aorta was noted. After surgery patient was discharged on 8th POD with regular follow up instructions. After 1 year follow up patient was normotensive with good biventricular and pulmonary valve function.

Systemic and pulmonary outflow obstruction in a single ventricle situation – a rare association and its clinical ramifications
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Abstract
Background
The presence of both outflow obstructions is a rarity as embryologically the reduced blood flow through one pathway increases the blood which passes through the other resulting in either pulmonary outflow or systemic outflow obstruction. We present an exceptional case of tricuspid atresia, severe pulmonary stenosis, with right aortic arch, mirror image branching with persistent fifth aortic arch and coarctation, the right subclavian artery was arising distal to the coarctation and the dilated left innominate artery along with the dilated left internal mammary artery was supplying collaterals to both systemic and pulmonary circulation. The anatomy, embryology and the clinical implications merit discussion.
Clinical presentation
A 6 yr old girl presented with cyanosis, and recent hemoptysis and increasing fatigability which made the parents seek medical attention. On examination she was a 15kg child with saturation of 60% in room air, the right and the femoral pulses were weaker compared to the left radial pulse. The 2D-echo showed tricuspid atresia with severe pulmonary stenosis with large ASD and normally related great vessels, the aorta was right sided, no patent ductus could be identified and the branch PA appeared normal sized and confluent. The left ventricle was hypertrophied. CT angiogram showed right aortic arch with persistent fifth aortic arch and coarctation of the aorta distal to the right common carotid
with right subclavian artery arising distal to the coarctation. The left innominate artery was hugely dilated with multiple tortuous collaterals and dilated internal mammary artery collateralizing with both distal aorta and the pulmonary circulation. A cardiac catheterization confirmed the above echo and CT angiographic findings and showed an LV end diastolic pressure of 18 mmHg. The pulmonary artery could not be entered. There was gradient of 30mm Hg across the coarctation segment.

Management

The clinical consideration was managing a single ventricle patient with coarctation, pulmonary stenosis and high left ventricular end diastolic pressure. We decided to stent the coarctation first with a hope to reduce the LV end diastolic pressure and then decide further management based on pulmonary artery pressure. The child underwent a successful coarctation stenting and was then taken for surgery, during which increased bleeding was noticed from the left side of the sternum, the PA pressure was 21 mmHg and with a background of hypertrophied ventricle with increased LVEF diastolic pressure, it was decided to perform a systemic to pulmonary artery shunt with a 5mm PTFE conduit. The saturation improved to 82% from 60% and she was extubated the same day and was discharged after 5 days with symptomatic improvement. She is being followed up to assess her candidacy for future single ventricle palliation.

Conclusion

Presence of both ventricular outflow obstruction in the setting of single ventricle is extremely rare which theoretically appears like an embryological improbability. The high end-diastolic pressure caused by the outflow obstruction can impact their palliation with cavo-pulmonary shunt and they may better be served with systemic to pulmonary artery shunt, at least initially.

Surgical Management of Upper Tracheal Lesions

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Abstract

Aim and Objectives

Proper investigations are mandatory in planning management. The main investigations are flexible fiberoptic bronchoscopy and good quality computed tomography (CT) with 3 Dimensional (3D) reconstruction. The lesions include postintubation strictures, acquired non-malignant trachea-oesophageal fistula (TEF) and upper tracheal tumours.

I will be presenting series challenging cases highlighting the management of high tracheal tumour, long segment tracheal stenosis, post intubation tracheal stenosis, segmental tracheomalacia.

Methodology and Results

We have managed most of our cases with laryngeal mask airway (LMA). This gives us adequate visualization of vocal cord and its movement, distance of the vocal cords to the upper end of the lesion and the distance of the lower end of the lesion to the carina. It is necessary to preserve recurrent laryngeal nerve (RLN), this is done by dissecting as close to the trachea as possible by sharp dissection to prevent neural injury. And avoid cutting the cricothyroid junction posteriorly. It is important to use intraoperative bronchoscopy through the LMA and mark the site of tracheal incision by a needle. IN TEF the site of the fistula must be demonstrated by a 3D CT, Bronchoscopy and Esophagoscopy. It is important to cut the trachea through & through transversely and carefully separate trachea and the esophageal wall without further injury. The esophageal side is closed by continuous and interrupted Polyglactin suture. Trachea is repaired as usual with stitches 4 mm apart and 4 mm from the cut edge. Frozen section is important to assess the margin during tumour resection. We must be careful enough not to resect too much of trachea and land up with two cut ends which cannot be anastomosed.

Conclusion

Tracheal surgery has a steep learning curve, our results have improved significantly, because of better planning, surgical skills and postoperative management.

Surgical Management of partial anomalous pulmonary venous connection-Our experience

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Abstract

Aim & Objective

Partial anomalous pulmonary venous connection (PAPVC) is a congenital pulmonary venous anomaly that involves drainage of one to three pulmonary veins into the right sided circulation. We explore early results after surgical management of PAPVC at our institution.

Material & Methods

70 patients who underwent surgery for PAPVC between 2013 and 2020 were included in the study. Patients were in the age group of 3 years to 30years. Clinical and echocardiographic follow-up was obtained.

Results

PAPVC was right-sided in all cases. In 93% of the patients right sided PAPVC was associated with sinus-venous atrial septal defect. In all patients surgical management included rerouting of PAPVC using glutaraldehyde treated pericardium along with SVC augmentation. There was no early or late mortality.

Conclusion

Surgical management of PAPVC is associated with excellent outcomes.

Surgical Management of Embolized Cardiac Devices as an Emergency

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Abstract

Aims and Objectives

We analyzed our experience with emergent surgical management of displaced /impacted cardiac devices after failure during attempts to occlude the defects by transcatheter route.

Material and Methods

Records of 185 patients who underwent device closure of congenital heart defects during the period from November, 2000 to Oct 2017, were reviewed from Registration section of our institute.5 of such patients were shifted to OR for surgical management of failed devices. Their diagnosis, selection for device closure and surgical management techniques are discussed.

Results

2 of 5 patients had failed device closure of patent ductus arteriosus whose device had embolized to left pulmonary artery. Both had successful retrieval without cardiopulmonary bypass through left thoracotomy. 2 patients who had undergone device closure for atrial septal defect, had device impacted in right ventricular apex and right ventricular outflow tract respectively. Both of them were successfully managed by surgical removal through right atrial approach on beating heart cardiopulmonary bypass. 5th patient was taken for percutaneous closure of a muscular ventricular septal defect but actually
Surgery in Post COVID Lung Complications
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Abstract
Aim
Coronavirus disease 2019 (COVID-19) caused by SARS-CoV-2 has been associated with wide range of opportunistic bacterial and fungal infections. Pulmonary complications like recurrent infection, bronchiectasis, empyema, bullae, pulmonary infarctions and cavities and lung fibrosis may occur in Post COVID phase and a certain group of patients benefit greatly from surgical management.

Methodology and Results
Case 1 was a 62-year-old male COVID recovered with uncontrolled diabetes, he had a rapidly progressing left upper lobe fungal pneumonia with mediastinal fat involvement was not responding to systemic antifungals. He underwent a left upper lobectomy. He required a prolonged intercostal drain and antifungal agents.
Case 2 was a 47-year-old gentleman with uncontrolled diabetes, COVID recovered, had a ruptured left lower lobe abscess with an empyema and a Pleuro-cutaneous fistula who required left lower lobectomy as a source reduction procedure and was followed up with systemic antifungal agents for 3 months.
Case 3 was a 51-year-old male with necrotising lung abscess of the left upper lobe with disease extension across the fissure into lower lobe who required a left pneumonectomy to take care of the disease.

Conclusion
Post COVID fungal and bacterial lung infections are rapidly progressive and disseminate to nearby organs / structures, and can be fulminant and difficult to treat. They need to be identified early and initiated on appropriate treatment. Multidisciplinary management is essential. This subset of patients are poorly preserved, with poor respiratory reserve. It is important to identify correct surgical candidates, lung parenchyma preserving procedures are preferred. Post COVID lung with parenchymal scarring, fibrosis and associated pleural space infections are not suitable candidates for decortication.

Superior Mediastinal Tumour Excision Through Upper Partial Sternotomy and Chamberlain Incision
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Abstract
Keywords Superior mediastinal tumour, Chamberlain incision, Partial sternotomy.

Introduction-
Superior mediastinal mass excision can be performed by various approaches such as partial sternotomy, mini trapdoor incision, anterior cervical transsternal approach and lateral thoracotomies. However, adequate exposure especially superior surface excision seems to be difficult. Hence, we advocate the use of upper partial sternotomy with left or right chamberlain incision which provides good exposure in addition to ease of patient position, vascular control and emergency institution of cardiopulmonary bypass.

Material & Methods-
Total eight patients of mediastinal mass were operated in the department of Cardiothoracic and Vascular surgery, Safdarjung Hospital, New Delhi between June 2019 to May 2021 out of which four patients with superior mediastinal mass underwent upper partial sternotomy.

Surgery for Type A Acute Aortic Dissection- Our 3 years experience
Pankaj Aggarwal, Apeshka Mittal, Shyam K S Thingnam, Harkeet Singh, Anand K Mishra, Sachin Mahajan, Rupesh Kumar, Vivek Jaswal, Vidur Bansal, Vikram Halder

Abstract
Objective
To study the various surgical techniques for Type A Aortic Dissection.

Materials and methods
Study design- Retrospective observational study. Patients operated over past 3 years were recruited into the study after taking informed consent. Preoperative details including 2D Echo and CT angiography was recorded. Intraoperatively cannulation strategy, cerebral perfusion strategy, proximal and distal extent of aortic replacement and cross-clamp (AXC), antegrade cerebral perfusion (ACP), deep hypothermic cardiac arrest (DHCA) and cardiopulmonary bypass (CPB) time were recorded. Postoperatively immediate and delayed morbidity and mortality were recorded.

Results
A total of 41 patients with type A aortic dissection were operated in last 3 years at our institute. Twenty four (58%) patients underwent Modified Bentall + Hemiarch replacement, 10 (24%) underwent supracoronary + hemiarch replacement, 3 (7%) patients underwent modified Bentall procedure while 2 patients (5%) each underwent modified Bentall + Total arch replacement and Supracoronary ascending aorta replacement.

Conclusions
Ascending aortic dissection is a surgical emergency associated with high morbidity and mortality. Refinement of techniques overtime has resulted in improved outcomes and appropriate planning remains the cornerstone for a favorable outcome.
with chamberlain incision. Preoperative clinical and radiological assessment was performed. Clinical characteristics, intraoperative and postoperative outcomes were recorded.

Results-
All patients included in this study were female with mean age of 30.5 years and one of them was identified incidentally. All patients underwent surgical excision through upper partial sternotomy with extension to left or right chamberlain incision. Out of four in two patients incision was changed to median sternotomy. Mean duration of surgery was 3.8 hours and mean postoperative hospital stay was 6.7 days. Opioids was used only in 4th patient. All patients were followed up at 3 months and 6 months and all patients are doing well.

Conclusion-
Upper partial sternotomy along with right or left chamberlain incision is safe and effective in terms of exposure with early recovery as well as cosmesis.

Right pulmonary artery - left atrium fistula: an institutional experience of seven cases over two decades.
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Abstract
Keywords Right Pulmonary Artery to Left Atrial Fistula; Cyanosis; Contrast Enhanced Computed Tomography.
Aim / Objectives
To report a series of 7 patients of Right Pulmonary Artery to Left Atrial fistula operated in our institute between 1998 and 2019.
Material and Methods
All the cases, after being diagnosed with appropriate investigative modalities, were subjected to surgery with or without the help of extra-corporeal circulation based on anatomy and location of fistula. We present a comprehensive management of this entity in an organised manner with excellent results, even in adult population.
Results
There were no early or late post-operative deaths. Echocardiography at the time of discharge and last follow up showed no residual shunt and good biventricular function. Mean duration of follow up was 3 years, with resolution of symptoms in all.
Conclusion
An exact diagnosis of RPA-LA fistula is crucial as it decides further management. Cardiac catheterization remains the gold standard. CECT with selective pulmonary angiogram or MRI with dynamic pulmonary angiography should thus be the main stay for diagnosis which will preclude the need of cardiac catheterization in the present era.

Revascularization of coronary artery with Left Internal Mammary Artery (LIMA) – LIMA ‘Y’ conduit
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Abstract
Keywords Left Internal Mammary Artery, Vascularisation, Proximal LAD
Aims/Objective
The Left internal mammary artery (LIMA) is considered the conduit of choice for the surgical treatment (CABG, coronary artery bypass grafting) of Coronary artery disease (CAD) due to its superior long term patency. LIMA-LIMA ‘Y’ in CABG increases the number of arterial graft and more completeness to the arterial revascularization. To increase the number of arterial graft and improved long term patency especially in diabetics and obese patients, LIMA-LIMA ‘Y’ Graft play a vital role in patients with tight proximal lesion.

Method-
Perioperative data were retrospectively collected from all patients with isolated CAD with tight proximal LAD lesion, who underwent off-pump CABG from May 2019 to December 2021 at a single Centre. A total of 19 patients had LIMA-LIMA ‘Y’ grafts pattern with severe proximal LAD lesion.

Results-
The mean age was 53±8.4 years, male & female ratio was 4:1. Left main involvement was in 15% & triple vessel disease was 85% with LVEF 48.3±8.6. LIMA-LIMA ‘Y’ grafts were done in 19 cases. Early results showed none of the patients had perioperative MI or wound infection.

CONCLUSION-
LIMA-LIMA ‘Y’ graft is safe, with improved overall long-term patency and is a reproducible alternative in the presence of severe proximal LAD lesion to the complete arterial revascularization of the anterior & lateral myocardial wall. Prevents usage of other arterial conduits like Right Internal Mammary Artery and Radial Artery.
None of the patients had perioperative MI, wound infection. Patients have improved functional capacity.

Long term follow-up with coronary angiogram is essential to recommend this technique as standard one.

REDO Mitral Valve Replacement with Upgradation by 3 sizes
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Abstract
MVR is performed in children when mitral valve repair is not anatomically feasible. Redo MVR is inevitable as they grow older, usually due to patient prosthesis mismatch.

This is because of somatic growth and the duration has reported to be 9.6 ±6.6 years in children less than 5 years of age at initial MVR.

Case report
A 20 year old Male from Zambia underwent resection of subaortic membrane and mitral valve replacement with 21 size mechanical valve in 2009. He presented with dyspnoea on exertion class III, pedal edema and signs of Right Ventricular Dysfunction. ECG showed Left bundle branch block. Two Dimensional Echocardiography showed severe LVH, severe RV dysfunction with dilated Left ventricular cavity and Mitral valve regurgitation. He was evaluated with routine investigations and heart team discussion recommended Redo MVR with larger size mechanical valve and Tricuspid Valve repair. He was taken up for surgery on 08/10/2021. Through Midline Sternotomy, the 21 size mechanical valve with pannus growth along the Annulus was removed Replaced with 27 size Mitral valve in 2021. After the post-operative period, patient needed prolonged ventilation with an otherwise smooth recovery. He was discharged home on 22nd post-operative day. Prior to discharge 2D echocardiography was done and valve function was confirmed. Redo MVR often present as a demanding procedure with a high operative risk and is associated with significant morbidity and mortality. Mechanical valve implantation, concomitant procedure, infective endocarditis and a higher STS score have been reported as predictors of mortality. Alsoufi and associates have reviewed the results of 305 children who underwent MVR. They have concluded
that a larger prosthesis could generally be placed at the time of mitral re-operation. In children who were < 20 kg in weight at the time of MVR, a prosthesis that is on average 4 mm larger could be placed at a mean interval of 6 years, indicating that the annulus of mitral valve, continue to grow despite the fixed size of the stented prosthesis sewing ring.

REDO AVR - A REASONABLE AND SAFE PROCEDURE - Review of outcomes at a tertiary center
M Tribhuvan Kumar, Vikas, Guide: RV Kumar, Tella Ramakrishna Dev, Sai Surabhi

Abstract
Aims and Objectives
To study the clinical profile of patients presenting for redo AVR surgery. To discuss various surgical strategies. Assess surgical outcomes.

Material and Methods
We retrospectively analysed 13 patients who underwent redo AVR surgery at our hospital from 2019 to 2020. Data has been collected from medical records which included epidemiological information, clinical presentation, clinical signs and investigations.

Results
8 cases belong to male and 5 cases to female. 8 cases were of stuck aortic valve, 1 case was of prosthetic valve endocarditis, 1 case was severe AR S/P RSVG repair, 2 cases were of CRHD severe AR S/P MVR and 1 case of severe AR Takayasu arteritis S/P aortic root replacement. 3 cases were emergencies, 4 were urgent surgeries and 5 were elective surgeries. Most common symptom was exertional dyspnea grade III, followed by chest pain and others. All cases were approached through redo median sternotomy. AVR was done in 11 cases with SJM mechanical rotatable valve and aortic root replacement in 1 case. Thrombus was extracted in 1 case. CPB access was with Right femoral access in 7 cases, Aortic root access in 3 cases, and right axillary access in 3 cases. Mean pump time was 195mins and mean clamp time was 79.5 mins. Common post-operative complication was low cardiac output syndrome followed by bleeding, post-operative sepsis, wound infection, AV block, renal failure, others. Mortality occurred in 2 cases.

Conclusion
Redo AVR surgery has more male predominance with dyspnea, chest pain and palpitation as most common symptoms and signs. Most common employed route of surgery is redo sternotomy with right femoral CPB access. Complications were bleeding, low cardiac output, sepsis, renal failure. Prognostic markers of mortality were severe LV dysfunction, heart failure, emergency presentation and renal failure. Mortality was noted in 2 out of 13 cases. Redo AVR surgery can be conducted safely with good and acceptable overall outcomes with precise diagnostic and operative planning and strategy.

Rare case of APLA syndrome causing pulmonary thromboembolism
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Abstract
Introduction: Incidence of antiphospholipid antibody syndrome (APLA) is rare, approximately 5 cases/lakh person/year. APLA causing pulmonary thromboembolism is further very rare entity. Here we found a rare case of APLA syndrome causing pulmonary thromboembolism who underwent pulmonary thrombo-endarterectomy in our institute.

Methods:
Present case is a 23/M presented to us with difficulty in breathing. He had low SpO2-87 % even with 4-5L of oxygen. He underwent CT-Pulmonary angiogram at outside institute, on which he was diagnosed to have large right side pulmonary thromboembolism (RPA-blocked at origin) and LPA-diffuse blockages with severely dilated RA and RV, with RVSP-54mm Hg and severe RV dysfunction (TAPSE-5). After preoperative work up and evaluation, he underwent pulmonary thrombo-endarterectomy under total circulatory arrest.

Results:
Patient withstood the procedure well. He was extubated after 24 hrs of elective ventilation. Postoperatively his PAP were approximately 35/20mm Hg, his RV function improved (TAPSE-10) and saturation improved to 96-97% at room air. He is being followed up on OPD basis with anticoagulation.

Conclusion:
APLA syndrome causing pulmonary thromboembolism is rare and results of surgery are good if diagnosed and treated early.

Quicker, Cost effective and Safer method of Mitral valve replacement Surgery – A Study of 642 patients
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Abstract
Objective
Mitral valve replacement is a standardized technique. But a lot of research is being done to optimize exposure of mitral valve, to reduce the Cardiopulmonary bypass time and to preserve the ventricular geometry. This article describes the techniques of optimal mitral valve exposure and surgical steps that we followed in 642 patients, which resulted in quicker, cost effective and a safer way of replacing it.

Methods
All the patients had chronic mitral valve pathology. Our surgical procedure includes dissection of a part of superior and inferior venacava from the adjacent pericardium, dissecting the plane between the superior venacava and Right superior pulmonary vein for optimal exposure of Left atrium. We follow papillary muscle suspension technique during mitral valve replacement to preserve left ventricular geometry. Echocardiography was done in the pre-operative period, immediate post-operative period, at 6 months follow up, at 1 year follow up and the results were analysed.

Results
Patients included in the study were 642. Males were 47.5% and females were 52.5%. There was no operative mortality. Average cross clamp time was 19.5 +/- 1.5 minutes. Average Cardiopulmonary bypass time was 47.6 +/- 3.2 minutes. Left ventricular ejection fraction did not change significantly. Left ventricular end-diastolic volume, end-systolic volume and stroke volume indices decreased significantly at follow-up echocardiography.

Conclusion
Our technique of mitral valve replacement for chronic mitral valve pathology was simple, quick, cost effective and safe with preservation of left ventricular geometry.

Pulmonary Arterial Hypertension Regression And Short Term Outcome After Mitral Valve Replacement In Patients With Severe Mitral Stenosis And Moderate To Severe Pulmonary Hypertension
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Abstract

Keywords Pulmonary arterial hypertension, Mitral valve replacement, Pulmonary artery systolic pressure.

Objective

To determine the regression of pulmonary arterial hypertension in patients with Mitral stenosis after mitral valve replacement.

Methodology

This cross sectional study was conducted at Department of Cardiac Surgery, Bangabandhu Sheikh Mujib Medical University from 1st January 2018 to 31st December 2021. Patients undergoing Mitral valve replacement for rheumatic valvular disease, aged 22 to 65 years were selected. Patients with concomitant aortic valve disease and coronary artery disease, severe renal impairment (creatinine clearance less than 40 ml/min), moderate to severe left ventricular dysfunction i.e. LVEF<40% were excluded from the study. Pre and post 24 hour Echocardiography was performed to measure pulmonary arterial hypertension (PASP).

Results

Out of 70 patients, 39% were males. Patients’ mean age was 35.56±13.34 years, mean height of 136.37±18.98 cm and mean weight of 43.32±8.65 kg. Postoperatively LVISD was 9.8±1.4 mm, LVPWD 9.36±1.55 mm, LVIDD 48.2±7.29 mm, and EF was 49.11±9.23%. Trend towards postoperative arrhythmia was significantly less about 1%. Mortality was found in 3.3% of patients. Mean PASP significantly declined by 10.2 mmHg from baseline 52.54 ± 11.6 to 41.54 ±10.24 mmHg 24 hours following MVR (p= 0.001).

Conclusion PASP returned to near normal values in the majority of patients with severe pulmonary arterial hypertension after MVR and the decrease is significant.

Proximal AP window with Internal PA banding: A simple alternative to Norwood or DKS reconstruction to palliate single ventricle physiology

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Abstract

Background

PA banding is a preparatory and palliative procedure to reduce pulmonary blood flow and increase systemic flow. In resource-constrained countries, a significant proportion of single ventricle patients present late who cannot be taken down the single ventricle pathway who are in need of some sort of palliation to improve systemic perfusion and restrict pulmonary flow.

The Achilles heel of the procedure is the incidence of complications and incidence of sudden cardiac death. This presumably occurs during episodes of pulmonary hypertension which occurs due to reactivity of the pulmonary vascular bed leading to a sudden reduction in both systemic and pulmonary output. We propose that a proximal AP window and a distal internal PA banding using a fenestrated patch would combine the advantages of Norwood and DKS procedures.

Methods

5 patients with single ventricle physiology with increased pulmonary blood flow, where there is potential for systemic flow obstruction due to the presence of a large conus underwent the procedure. The age range was from 2 months to 6 months, 3 females and 2 males. The diagnosis was various forms of DORV in 3, and Hypoplastic left heart syndrome in 2.

Results

The median ICU stay was 5 days (3-10 days), The ventilation duration was median 72 hrs (24-120 hrs), there were no sudden desaturations or bradycardia in the post-op period, the period of follow up ranges from 6months to 3 years. All the children are thriving well with saturations in 80’s. None of these children has had the second stage procedure.

Conclusion

Creation of AP window with internal PA banding can be a useful tool in the management of conditions where there already is or there exists a potential for systemic outflow obstruction, in the presence of a single ventricle or there is a possibility of future two ventricle repair. This combines the advantages of the DKS procedure and conventional PA banding, without increasing the technical complexity or the use of resources. The initial experience has been satisfactory in terms of immediate and short term follow up. More numbers would be necessary to establish the safety and utility of this promising technique.

Predictors and outcomes of AV fistula in patients on hemodialysis at a tertiary healthcare institute

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Abstract

Keywords Hemodialysis, arteriovenous fistula (AVF), End stage renal disease (ESRD).

AIMS AND OBJECTIVE:

To assess predictors and outcomes of AV fistula in patients on hemodialysis.

Background

It remains challenging to accurately predict whether an arteriovenous fistula (AVF) will be useable for hemodialysis as a vascular access. The ideal AVF must achieve an adequate connection between the high-pressure arterial and low-pressure venous systems; bypassing the small capillary network of the palmar arch while maintaining arterial perfusion and venous drainage in the tissues distal from the site of creation. Improved AVF outcomes have been associated with strategies such as routine preoperative ultrasound mapping.

Material and methods

Type of study: Prospective observational study, analytical study conducted at Department of CVTS, Seth GSNC and KEM Hospital, Mumbai

Study duration: 1 year

Sample size: 200

Fistula creation strategy is to start distally in the non-dominant arm and then proceed proximally: i.e. a radiocephalic AVF, followed by a brachiocephalic AVF and then lastly a brachiobasilic AVF.

Results

Males were (56.36%), majority age group >60 years (54.55%), followed by 41 to 60 years (41.82%). 23.64% were diabetic, and 16.36% subjects had IHD, and 14.55% had PVD. 56.36% had distal radial artery AVF, and 43.64% had proximal radial artery AVF. The mean diameter of artery was 2.64 mm (SD = 1.02), and the mean diameter of vein was 2.49 mm (SD = 0.71). The mean of maturation period was 45.4 days (SD = 41.2 days). Majorities were on thrice weekly hemodialysis. Last IV prick more than 3 weeks was associated with poor outcomes. Previous failed fistulas had worse outcomes.

Conclusions

Successful vascular access provision is the foundation for successful hemodialysis. Surgeon has to rely on clinical judgement and other investigatory parameters including a pre-operative duplex scan and arterial and venous diameters and postoperative flow rate.
Abstract

Keywords Aneurysm, false, exostoses, multiple hereditary, popliteal artery

Aims/Objectives

Osteochondromas, or exostoses, are common benign bone tumors due to growth abnormalities of the epiphyseal plate. Because the major limb vessels are in close proximity to the long bones, the association of vascular complications with exostoses, although rare, has been seen. We present a case of popliteal artery pseudoaneurysm secondary to femur exostosis in a known case of multiple exostoses.

Materials and Method

A 35-year-old woman presented with a painful pulsatile swelling in the lower medial aspect of the left thigh. Investigations revealed a pseudoaneurysm arising from the left popliteal artery adjacent to femur exostoses. Skeletal survey revealed multiple exostoses involving the upper and lower limbs.

Results

Surgical excision of the pseudoaneurysm was followed by ePTFE patch repair of the defect and excision of the exostoses. The post-operative course was uneventful. The vascularity of the limb was normal, and the patient returned to her routine activity. She was followed up for 6 months, and Doppler imaging on two occasions revealed a normal flow signal.

Conclusion

Excision and repair of pseudoaneurysm is a definitive treatment with excellent results.

Penetrating neck trauma - A hybrid approach to management

J Kovacic

Abstract

Objectives

Penetrating neck injuries (PNI) comprise 5 to 10 percent of adult traumatic injuries. Exsanguination is the most common cause of immediate death, usually involving the carotid artery. We present a unique case of PNI in our institution, managed with a hybrid endovascular and open surgical approach.

Method

Patient medical history, demographics and investigations were sourced by electronic medical records. Intra-operative photographs were collected.

A 33-year-old male presented to our institution via ambulance having sustained a stab wound to the left side of his neck. Our case describes sequence of events from emergency management, investigations, and a detailed description of a hybrid endovascular and open approach to the management of left-sided penetrating neck trauma with internal carotid artery (ICA) injury.

Results

The patient was promptly transferred to a hybrid operating suite. Digital subtraction angiography (DSA) confirmed a 7mm diameter pseudoaneurysm in the wall of the proximal left ICA. An appropriately sized stent graft was unavailable to treat the pseudoaneurysm. Consequently, a viatrac 14Fr balloon was advanced to the distal common carotid artery (CCA) and left in place to control bleeding if necessary.

Thereafter an oblique, curvilinear incision was made over the left side of the neck. During exposure of the large vessels of the neck, significant haematoma was encountered and evacuated with gentle suction. The CCA, ICA, ECA and IJV were identified and controlled with silastic loops. Transverse lacerations were identified in the lateral walls of the proximal ICA and IJV, and repaired primarily with continuous 6-0 non-absorbable polypropylene sutures. The patient was transferred to ICU post-operatively for neurological observation and haemodynamic monitoring. He made a good clinical recovery and was discharged five days later.

Conclusion

We present a case of penetrating neck injury with concomitant lacerations of the internal carotid artery and internal jugular vein, in a profoundly unstable patient. The management of PNI requires rapid treatment by an experienced multi-disciplinary team and a high index of suspicion regarding damage to deep structures. Hard clinical signs are frequently absent and consequences of delayed diagnosis and intervention may include permanent neurological injury and death.

Palliative Senning in Eisenmenger’s syndrome with Transposition Physiology

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Abstract

Background

Patients with transposition physiology and ventricular septal defect (VSD) develop pulmonary artery hypertension rapidly and may not be candidates for corrective surgery early in the course of disease. These patients are characterized by aortic saturations which are lesser than pulmonary artery saturations. They have good bi-ventricular function, a large VSD and competent atrio-ventricular valves. The main clinical problem is significant systemic desaturation. Though they may be considered for heart and lung transplantation– the best results in published series have a median survival of 10 years, combined with the lack of availability of suitable donors, the expertise and the need for lifelong immunosuppression and surveillance makes this option practically difficult in most centers. Eisenmenger’s syndrome, where there is reversal of shunt after a period of left to right shunt, has a much better natural history. The idea of palliative Senning, is to convert the transposition of Eisenmenger’s physiology into normal Eisenmenger’s physiology, which has a better natural history than heart and lung transplantation. Though arterial switch without VSD closure will achieve the same physiological results- this comes with increased risk of bleeding, coronary related problems and the need to tailor the great vessel size to match each other.

The theoretical advantages of palliative Senning is that it is an atrial level operation with reduced risk of bleeding and the left ventricle may be a better ventricle to deal with the increased pulmonary vascular resistance. We present our experience with palliative Senning in this subset.

Methods

This is a retrospective observational study of patients who underwent palliative Senning between 2015-2021. 6 patients in the age group 3 years to 21 years who had transposition physiology with increased pulmonary vascular resistance (>8 wood units/m²), small left atrium and significant systemic desaturation (<70%) underwent palliative Senning after documenting at least 15% higher saturation in the pulmonary
Outcomes of surgery in post Covid pulmonary mucormycosis

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Abstract

Objectives. To evaluate the outcomes of early surgery in post COVID-19 patients with Pulmonary mucormycosis.

Materials and methods

Retrospective study from a prospectively maintained database in the Thoracic unit at Yashoda hospital, Hyderabad over a period of 10 months (Jan 2021–October 2021). Our cohort consisted of post COVID-19 patients who developed pulmonary mucormycosis and underwent surgical management (n = 16). An analysis of the demographic characteristics, perioperative variables, post-surgical complications and factors affecting operative mortality was done.

Results

Out of 16 patients, male female ratio was 13 (81.25%): 3 (18.75%) with mean age of 54 years (35-70). All the patients were type 2 diabetics (100%) with cough (100%) and breathlessness (50%) being the predominant presenting symptoms. Radiological presentation showed necrotizing cavity in 13 (81.25%) and non-resolving pneumonia in 3 patients (18.75%). All the patients had severe covid disease and were treated with high dose steroids with mean duration of treatment for COVID to diagnostic confirmation of pulmonary mucormycosis being 64 days (30-120 days). Mean duration from mucormycosis diagnosis to surgery was 3.87 days (range 1-10 days). Mean preoperative room air ABG pO2 was 65.4 mm of Hg (52.1-79.1) with room air Spo2 87-95 %. 17 surgical procedures which included 9 (56.6 %) lobectomies, 5 (29.4%) bilobectomies and 3 (17.6%) pneumonectomies were done. Post-operative complications occurred in 4 patients (25 %) with atrial fibrillation and bronchopleural fistula in 3 patients each (18.75%). Mean post-operative hospital stay of 13.37 days (5 – 33). Mortality occurred in 3 patients (18.75%).

Conclusion

Continued monitoring of post covid diabetic patients treated with high dose steroids is mandatory for early detection of PM which presents as a delayed complication. Early aggressive surgery with antifungal therapy should be offered inspite of borderline pulmonary function. Mortality increases with poor pulmonary reserve and increased fungal load.

Outcomes of pericardiectomy in patients with constrictive pericarditis

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Abstract

Keywords TOF, Ascending Aorta Aneurysm, Bentall with ICR

Introduction- AIM

To study the outcomes of pericardiectomy in patients with constrictive pericarditis

Background

Constrictive pericarditis is a chronic inflammatory process that involves both fibrous and serous layers of the pericardium leading to pericardial thickening and compression (constriction) of the ventricles. The resultant impairment in diastolic filling reduces cardiac function.

Methods

All constrictive pericarditis patients operated between January 2002 and May 2021 in our centre were followed up. There were a total of forty eight patients. Demographic, preoperative, intraoperative and postoperative data and long-term outcomes were analysed.

Results

Fourteen of the patients were female, and thirty four were males of total forty eight patients. The mean age was 37.8 years. Aetiology of constrictive pericarditis was tuberculosis in 30(71.4%) patients, idiopathic in 8 (16.3%), prior cardiac surgery in 1 (2.0%), non-tuberculous bacterial infections in 4 (8.3 %), and post-traumatic in 1 (2.0%). The surgical approach was achieved via a median sternotomy in all patients. Of the 48 patients, cardiopulmonary bypass was used only in 2 patients. 75 percent of patients were in functional class I on follow up. In-hospital mortality rate was 4.1% (two patients). The cause of death was pneumonia leading to progressive respiratory failure. The late mortality was 1 patient (2.0%). The mean follow-up time was 94.7 months, minimum duration of follow-up was 3 months and maximum duration of follow-up was 223 months. The actual survival rates were 95.6 %, 95.6 % and 93.7 % at 1, 5 and 10 years, respectively. None of the patients required re-operation, one patient had CVA during follow up.

Conclusion

Pericardiectomy is a safe procedure in expert hands and can be performed with low in-hospital mortality and good long term outcomes.
Abstract
Background:
Abdominal Aortic aneurysm is most frequent during 5th and 6th decade with atherosclerosis as the commonest cause. We have conducted Aneurysmectomy by open technique which still is believed to have better long-term benefits and lesser chances of re-interventions in contrast with Endovascular technique, given the current scenario.

Methods:
37 patients were operated in five years for Infra-renal abdominal aortic aneurysms. Investigative tools included USG, CT Angiography, MRA and Echo. Carotid Doppler, Coronary Angiography and Renal Doppler were selectively done as per situation. Abdomen was opened through midline or paramedian incision. Proximally, Infra-renal and exception-ally suprarenal aorta, and distally the common iliac arteries were controlled. Aneurysm was opened after fine dissection and isolation of branch vessels, and systemic heparinization. Distal anastomosis with common iliac was done first followed by proximal anastomosis. IMA was reimplanted in 3 patients due to poor return. For ruptured aneu-rysms patients were well optimised before exploration. Aorta was con-trolled proximally and distally. Aneurysmal sac was opened and aorta reconstructed by a Dacron tube graft (Y-Graft) Of appropriate size.

Results:
7 of 37 operated patients had ruptured aneurysm and rest were operated electively with intact aneurysms. One patient developed torsion of gut while another had duodenal perforation with upper bleed and peritonitis and died after 4 months of surgery. Third patient developed distal thromboembolism of left lower limb. 3 of 7 patients with ruptured aneurysms died of exan-guination during exploration. 30 patients went home with satisfactory results.

Conclusion:
Abdominal aortic aneurysm and its management continues to be a surgical challenge. Surgery continues to be a standard procedure, especially in centers where endovascular techniques are not available. Aggressive approach to resuscitation and operation during the golden period is very vital for a positive outcome.

One and half patch technique of AV canal repair
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Abstract:
Background:
The debate about the correct surgical technique to correct common AV canal has existed right from the time surgical repairs were started for this anomaly. This has centered around using two patch technique with one patch for atrial and the other for the Ventricular component of the defect or the classical single patch technique which involved the division and reattachment of the leaflets to the single patch used to close the canal defect, and the modified single patch or the Australian technique in which the leaflets are sutured to the crest of the ventricular septal defect and then closing the atrial septal defect with a single patch. The closure of the cleft has been another point of contention. The fact that there is no consensus indicates that there is no universally applicable ideal solution to every anatomic situation. We describe a technique which incorporates the advantages of all the above procedures tailored to the anatomic situation.

Methods:
The technique we describe is useful for those anatomic situations where there is large scooped out defect in the anterior part of the ventricular wall.
septal defect in the sub-aortic region with numerous chordae covering the defect in the posterior part of the defect towards the crux of the heart, this is common in situations where there is associated tetralogy or double outlet right ventricle. The posterior part with crowded chordae is closed with modified single patch technique, the anterior aspect depending on the amount of aortic override is closed with a patch with or without dividing the tricuspid component of the superior bridging leaflet. The cleft was closed with interrupted sutures. In one patient the commissure between the posterior bridging leaflet and the left lateral leaflet was closed to prevent relative prolapse of the lateral leaflet. The Tricuspid component of the cleft was also carefully closed and tricuspid component received equal attention as the mitral component.

**Results:**
We have used this technique in 5 patients, 2 with tetralogy of Fallot with AV canal defect, 1 with Double outlet right ventricle(DORV) and 2 with just a large anterior ventricular defect. In patients with tetralogy and DORV, the leaflet was divided and reattached to the ventricular septal defect patch. 2 were children with Downs syndrome. The follow up ranged from 3 months to 5 years. During this period the repair remained stable with only mild MR in two, no LVOT and trivial TR in 3. There were no rhythm related abnormalities.

**Conclusion:**
The technique of posterior no patch and anterior patch closure of the ventricular component of the defect of AVCD offers advantages in some anatomical subsets with large anterior subaortic component, however care has to be taken to close the cleft carefully and maintain the plane of coaptation of the posterior bridging leaflet with the lateral leaflet.

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**Efficacy and safety of unfractionated heparin plus low dose aspirin in peripheral vascular repair**

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**Abstract:**
Aims and objectives:
To determine the efficacy and safety of combination of unfractionated heparin plus low dose aspirin in peripheral vascular repair patients, given from day one.
To estimate the rate of complications in vascular trauma surgical patients treated with this combination in standard clinical practice.

**Material and Methods:**
A prospective, single centre based study carried out in our tertiary care referral institute (Sher-i-Kashmir-Institute-of-Medical-Sciences {SKIMS}, department of Cardio Thoracic and Vascular surgery) in Kashmir, India. Thirty seven patients (who had traumatic peripheral vessel injury and underwent repair of the vessel) were included. Popliteal artery was mostly injured. Associated fractures were seen in 65 percent of patients. Patients received unfractionated heparin through continuous intravenous infusion. Aspirin 75 mg once daily was started within 6 hours after surgery. Combination therapy was initiated after surgery and continued for as long as 5-7 days. Efficacy was determined by clinical evidence and noninvasive vascular imaging methods.

**Results:**
A total of 37 patients were operated. Wound sepsis occurred in two patients. There was no thrombosis of the repaired vessel or gangrene of some part of the distal extremity in the treated subset. The incidence of hemorrhagic complications (wound hematoma 2.7%, and minor hemorrhage was seen in 5.4% of patients) were low. Moderate thrombocytopenia was seen in one patient. Clinically significant increases in alanine aminotransferase was observed in one patient. No case of pulmonary embolism or deep vein thrombosis was diagnosed. No patient died during course of treatment.

**Conclusion:**
We conclude that unfractionated heparin plus low dose aspirin combination from day one in peripheral vascular repair patients is safe and effective when used as thromboprophylactic agent in vascular trauma patients. There is a trend in risk reduction for various complications including vessel thrombosis.

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**MODIFIED OZAKI PROCEDURE – A 5 YEAR FOLLOW UP**

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**Abstract:**
**Background–**
Aortic valve diseases are the 2nd most common valvular heart disease prevalent in our country and the treatment includes aortic valve repair or replacement depending upon the nature of the valve. Valve replacement has its own potential risk of thromboembolism, prosthetic valve dysfunction. Inspired by Ozaki et al we present a series of 5 years follow up of autopericardial reconstruction of the aortic valve done in our institute.

**Aim:** To determine the outcomes of modified Ozaki during the follow up of 5 years

**Methodology:**
It is an ambispective study including 138 patients. Performed by a single surgeon with a follow up over a period of 5 years until 2021. All patients with severe aortic stenosis requiring valve replacement. Patients with aortic regurgitation in whom valve is not amenable to repair. Patients with concomitant valvular and ischaemic heart diseases were included in the study. Exclusion criteria - Patients who were not willing for the surgery.

**Operative Procedure –**
recreating the aortic leaflets which were tailored using customized indigenous Ozaki sizers by using the glutaraldehyde treated pericardium of the patients

**Observation and Results:**
The median age of the study population was 19 years. 76% were males and 24% were females. Isolated Ozaki comprised a total of 60 patients and Ozaki with concomitant procedures comprised a total of 78 patients. The median CPB time was 227 minutes and the median cross-clamp time was 145 minutes. The mean aortic valve orifice area was 2.23+/-0.565 cm2 and the mean aortic valve pressure gradient was 12.4+/-5.6 mm of Hg. From the total of 138 patients, 17 died (mortality rate 12%) after surgery of which 15 (88%) was due to MACCE during the period of 5 year follow up and 2 (11%) died of covid infection. 2 needed reoperation due to infective endocarditis. During the 5 years follow up period, the NYHA class improved to class I- II

**Conclusion:**
Ozaki procedure is a technically challenging and alternative feasible modality for aortic valve diseases with good long-term outcomes. It avoids the potential risk associated with prosthetic valve replacement like anticoagulation.

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**Moderate Renal Dysfunction GFR And Its Impacts On Short-Term Outcomes of Patients Undergoing Off-Pump Coronary Artery Bypass Grafting**

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Abstract:
INTRODUCTION:
This study assessed whether preoperative renal insufficiency predisposes patients undergoing off pump coronary artery revascularization to adverse post-operative outcomes.

MATERIALS AND METHODS:
From Jan 2016 through Dec 2018, 888 patients undergoing off-pump coronary artery bypass were categorized into four stages (groups) by glomerular filtration rate (GFR). Of these, 179 patients were in Stage 1 with normal renal function, 540 patients were in Stage 2 (Mild renal dysfunction), 154 patients were in Stage 3 (Moderate Renal Dysfunction) and 15 patients were in Stage 4 (Severe Renal Dysfunction). Patients with end stage renal failure were excluded. Preoperative variables and postoperative outcomes were compared among groups.

RESULTS:
Gender distribution among groups did not show any difference among the groups (p=0.31). Means of age was high in Group 4 (69.93±5.56). Patients in severe group showed higher rates of comorbidities when compared with mild, moderate and normal groups. Mean number of grafts used were similar between the groups (p=0.49). Postoperative CVA (p=0.67), inotrope usage (p=0.12), reintubation (p=0.54), postoperative AF (p=0.20), DSWI (p=0.85) and mortality (p=0.17) showed no significant difference between the groups.

Risk of mortality was high in those with severe renal dysfunction [16(6.67)] followed by moderate [3(0.95)], mild [5(0.93)] and normal [1(0.56)]. Highly statistically significant difference was observed with regard to ICU stay (p<.0001) and hospital stay (p<.0001) in severe group compared to other groups. Logistic regression revealed that COPD (p=0.04), prior CVA (p=0.002), low EF (p=0.0003) are the predictors of mortality.

CONCLUSION:
Preoperative evaluation of GFR is an important screening measure for patients undergoing CABG. There was no significant difference in the groups in terms of short-term mortality. Length of postoperative ventilation duration, incidence of postoperative AKI, need for postoperative dialysis and IABP usage was slightly higher in patients with severe renal dysfunction.

Management protocol for ruptured sinus of valsalva aneurysm: our experience
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Abstract:
Aim & Objective:
Sinus of Valsalva aneurysm is an abnormal dilatation of the aortic root located between the aortic valve annulus and the sinotubular junction. Variety of surgical strategies are available for the surgical treatment of ruptured sinus of Valsalva aneurysm (RSOV) from simple primary closure to patch closure. In our institute we reviewed our patients of RSOV over 8 years who have undergone RSOV patch closure +/- AVR.

Material & Methods:
Our retrospective review identified 12 patients who underwent RSOV repair between 2013 and 2020. Age ranged from 14-35 years. The RSOV originated from the right coronary sinus in 8 patients, from the non-coronary sinus in 3 and 1 left coronary sinus. Dual-chamber exposure (the involved chamber and aorta) was used in 11 patients.

Results:
All our RSOV patients have undergone resection of the aneurysmal tissue and patch closure of the RSOV and 10 patients have undergone AVR also.

Conclusion:
In our study all our patients who have undergone patch closure of RSOV have had an uneventful post-operative period and recovery. The therapeutic approach must be chosen according to the ruptured chamber and associated lesions. Patch repair of RSOV carries low morbidity and hence must be preferred over primary closure.

Impalement injury of the right thorax with two long iron rods.
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Abstract:
Impalement injury is a life threatening injury of rare occurrence. Most of the cases with thoracic impalement injury die at the site of accident and very few who reach the hospital there is horrifying scene and health providers usually don't have any clue, what to do however if appropriate specific protocols are followed, these patients can be successfully managed.

Case report:
18yrs old male patient presented with impalement injury of the thorax by iron rods used for construction of building(Fig A). On arrival to
hospital the patient was hemodynamically stable. Chest X ray demonstrated through and through penetration of thorax by metallic foreign bodies (Fig D). He was shifted to cardiothoracic surgery operation theatre. The patient underwent exploratory thoracotomy under general anaesthesia with ready femoro-femoral cardiopulmonary bypass, so as to ensure safety of patient in case of massive haemorrhage (Fig B). The rods were found to be penetrating the right lung upper and lower lobes(Fig C). The rods were extracted carefully and there was no penetration of vital structures. The lung injuries were stapled using GIA stapler by excluding the injured lung, avoiding impending pneumonectomy. There was no air leak and bleeding from lungs. He had uneventful recovery with normal lung fields on X-ray chest(Fig E). He was discharged on 7th postoperative day and was asymptomatic on his last visit on follow-up after 1 month.

Conclusion:
There are well defined guidelines described by Hyde et al. to manage impalement injuries of thorax which were followed in this patient, not only by the attendants of the patient for safe transport to hospital, but also by health care providers. To add further to these guidelines we emphasize not standby CPB, but ready CPB, with in-situ femoral arterial and venous cannulae connected to CPB circuit to ensure safety of patient in case of exsanguinating haemorrhage. Despite the dramatic presentation these patients may have minimal or no residual defects if the proper guidelines are followed.

Glyceryl Trinitrate-Verapamil Solution in Preparation of Internal Mammary Artery Conduit for CABG Surgery
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Abstract:
Background:
Coronary arterial disease is the commonest form of heart disease and the most important cause of premature death in the developed countries. CABG is established as the ultimate treatment modality for Coronary heart diseases with LIMA being grafted to LAD. Papaverine has been the conventional vasodilator used to combat vasospasm at the time of LIMA preparation in many cardiac surgery centers. Being highly acidic, Papaverine solution (pH 4.8) has been shown to damage the endothelium. Recent evidence associating Papaverine with vascular wall damage in bypass conduits has prompted the search for safe and effective alternative vasodilators. A buffered vasodilator solution containing glyceryl trinitrate and verapamil (GV) solution (pH 7.4) made a promising vasodilator for preparation of vascular conduits.

Methods:
This prospective observational study was performed at a hospital in Dhaka, Bangladesh between January and December 2018. A total of 60 patients were divided in 2 groups. Group A included 30 patients who received GV solution, whereas Group B included 30 patients, who received conventional Papaverine solution. These two groups were compared for LIMA flow before and after the organ bath, ICU stay, ECG, Echocardiography, mortality, morbidity and other important parameters. The objective of this study was to analyze the effects and safety of GV solution compared to Papaverine solution in this regard.

Results:
When the vasodilator agent was administered by organ bath technique, an increase of free flow i.e. after organ bath than before in both the groups (P < 0.0001). However, the after flow was significantly more in group A than group B (P < 0.0001). There was no mortality in group A and one mortality in group B. This result showed that GV solution is a safe alternative to Papaverine solution for IMA preservation.

Conclusion:
The GV solution represented a potent, rapid-acting, and safe alternative to Papaverine solution for prevention of spasm of LIMA during the preparation for OPCAB surgery.

Four-decade-old, benign trachea-mediastinal fistula
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Abstract:
Introduction:
Tracheo-mediastinal fistulae, especially those due to non-malignant causes, are uncommon. The condition has been reported following invasive instrumentation done in malignancy or in patients receiving immunosuppressive, anticancer chemoradiation and biological agent therapy. This report describes a case of tracheo-mediastinal fistula secondary to rigid bronchoscopy done 40 years ago and its surgical management, with a successful outcome.

Case History:
A 70-year-old, well built, healthy male, presented to the pulmonologist with incessant cough of 40 years’ duration. He gave a history of developing recurrent episodes of breathlessness and dry cough, for which he was evaluated at a tertiary care centre in 1982. He was advised rigid bronchoscopy and during the procedure he had a very troublesome bout of cough, followed by severe pain. No significant abnormality was found on Bronchoscopy. He had fever subsequently and his symptoms seemed to settle with management in the intensive care unit, including antibiotic therapy. Since then, he had been having recurrent dry cough, which progressively increased over the years to virtually an incessant cough, happening a few times every minute. His CT scan revealed a small cystic, air-filled space, located in the right posterolateral paratracheal area, 4 cm above the carina, communicating with trachea through a pin hole opening. There was no evidence of any fluid collection or inflammation. No connecting duct or opening was observed on rigid bronchoscopy. Upper GI endoscopy was done and this excluded hiatus hernia as a potential cause for his cough. In view of his protracted and extremely troublesome symptom for the past four decades, which affected his quality of sleep, a plan was made to excise the fistulous tract with closure of the tracheal end, under general anaesthesia. He underwent a right anterolateral mini-thoracotomy. The fistulous cavity was excised and suture closure of the tracheal opening of the fistula was done with right lung isolation. After the surgery, he was discharged on the 4th post-operative day uneventfully and was reviewed at 1, 3 and 6 months, with complete resolution of the long-standing, nagging cough.

Discussion and conclusion:
Management of tracheo-mediastinal fistulas include surgical closure, stem cell injection, stent placement etc. Factors contributed to fistula formation in the patient were instrumentation related injury which and the persistent cough which might have contributed to keep the small opening so formed into the mediastinum as a patent tract. SEMS were inappropriate choice in this patient. They promote the formation of granulation tissue and could not be used to our advantage as granulation would further produce obstruction and may aggravate his long standing cough.

Efficacy of Endoscopic Thoracic Sympathectomy in patients with Primary Palmar Hyperhidrosis in terms of Improvement in Quality of Life:
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Abstract:
Introduction:
Palmar hyperhidrosis is a chronic disorder that leads to subjective suffering which can compromise the patient’s quality of life. Endoscopic thoracic sympathectomy has provided excellent results in resolving palmar hyperhidrosis. The disease can vary in severity and quality of life is the ideal indicator to assess the physical, mental and emotional well-being of the patient.

Methods:
Patients undergoing Endoscopic Thoracic Sympathectomy for primary palmar hyperhidrosis were asked to answer quality of life questionnaires. The data was collected through clinic visits or telephone/ e-mail interviews pre-operatively, 6months and 12 months after surgery. Patients were required to fill out a detailed questionnaire that includes resolution of symptoms, post-operative complications, levels of satisfaction with the procedure, the incidence of symptom recurrence, sweating symptom-related quality of life (QOL) after the procedure, and satisfaction with the aesthetic result.

Results:
A total of 76 patients were made to answer the questionnaires before and after the surgery. The pre-operative evaluation of the quality of life scores reported 51 patients (67.1%) with very poor quality of life, while the remaining 25 patients (32.9%) with poor quality of life. None of the patients reported good, very good or excellent quality of life pre-operatively. The 6-month postoperative evaluation of the quality of life reported only one patient (1.3%) with a poor quality of life. His quality of life did not improve in the post-operative period. Two patients (2.6%) reported an improvement to a very good quality of life, while the remaining patients (96.1%) reported an improvement to excellent quality of Life. The 12-month follow-up illustrated a further worsening of the quality of life of the patient (1.3%) to Very Poor. One patient (1.3%) reported a worsening of quality of life from very good to good. The other patients did not depict any change in the quality of life, with one patient reporting very good while the remaining reporting excellent.

Conclusion:
Endoscopic Thoracic Sympathectomy for Primary Palmar Hyperhidrosis has shown effective improvement in the quality of life of the patients 12 months after surgery. However, compensatory hyperhidrosis remains the most important side-effect of the procedure.

Effectiveness of hands on versus video assisted training on Compression only life support among layperson
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Abstract:
Keywords: Compression only life support, Cardiopulmonary resuscitation, educative approach.
Aims and Objectives:
Out of hospital cardiac arrest claims a large number of lives every year across the world and about 90% of them die. Bystander cardiopulmonary resuscitation CPR if done on time improves the chances of survival. Teaching layperson to perform CPR is a challenge. Hence the researcher under took this study to assess the efficacy of hands on training and video assisted training in teaching Compression only support (COLS) among layperson.

Material and Methods:
Quasi experimental study included 180 subjects who were purposively enrolled in video assisted group and hands on training group. Nonmedical study subjects between age group of 19 to 65 years and were included in the study and the baseline knowledge and skill was assessed self-developed COLS knowledge questionnaire and COLS skill check list. Following which the interventions were given to the hands on group and video assisted group and immediate posttest knowledge, skill and attitude related to COLS training was assessed. One month after the intervention retention of knowledge, skill was assessed in both the groups.

Results:
Demographic characteristics in both the groups were similar. The posttest mean knowledge score and skill score in groups (19.87 ± 3.20, 23.29 ± 2.49) was significantly higher when compared with video assisted group (18.37 ± 2.11, 25.37 ± 1.95) at p value <0.05. The attitude score was favourable in the hands on group when compare with the video assisted group. In both the groups majority of the participants verbalized that they have fear of legal issues which prevents them from performing COLS in the real scenario.

Conclusion:
Though video assisted COLS training can be used as one of the teaching approaches for a larger population of people but hands on training still remains a better way to teach COLS. Combination of both the methods can be explored for increasing the retention of knowledge and skill related to COLS.

Effect of pulmonary endarterectomy on pulmonary artery pressures in patients of chronic pulmonary thromboembolism.
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Abstract:
Keywords: pulmonary endarterectomy, pulmonary artery pressure. AIM: To assess the effect of pulmonary endarterectomy (PEA) on pulmonary artery pressures and right ventricular function in patients of chronic pulmonary thromboembolism.
OBJECTIVES:
To assess factors like preoperative pulmonary artery hypertension and evaluate improvement after PEA. To evaluate right ventricular (RV) function using TAPSE after PEA.
MATERIALS & METHOD:
Retrospective analytical study. Study Period - Three years (January 2017 to December 2019). Inclusion criteria: Only those patients with thrombus in the main pulmonary artery, right and left pulmonary artery. Exclusion criteria: Patients administered Sildenafil were excluded from the study, loss to follow up, deaths. All the patients were evaluated preoperatively and postoperatively at 1 month and 1 year with echocardiography, TAPSE, CTPA. Data entered in MS Excel and analyzed using SPSS 22. Paired t-test used to analyse quantitative data.

RESULTS:
A total of 46 patients were operated with PEA. Out of which, 5 patients died either intraoperatively or post-operatively, 3 patients were administered Sildenafil preoperatively and 4 patients loss-to-follow up were excluded from the study. Total participants included in the study 34. Male (n=19), Female (n=15). Mortality rates at 1 month and 1 year were 5.1% (n=2) and 8.1% (n=3) respectively.

PULMONARY ARTERY PRESSURE:
Mean pulmonary artery pressure pre-operatively was 44.4 ± 5.7 mm Hg. Mean pulmonary artery pressure one month post-operatively was 34.5 ± 3.6 mm Hg. A significant decrease in pressure was found one month postoperatively, t(33) = 22.66, p < 0.001. Mean pulmonary artery pressure one year post-operatively was 31 ± 2.9 mm Hg. A significant decrease in pressure was found. t(33) = 21.13, p < 0.001.

RV function by TAPSE:
Mean pre-operative TAPSE value 12.8. Mean one month post-operative TAPSE value 12.6. No significant association was found on TAPSE values after surgery. t(33) = 0.712, p = 0.482. Mean one year
post-operative TAPSE value 13.1. No significant association was found on TAPSE values after surgery. t(33) = -0.804, p = 0.427.

CONCLUSION:
PEA is associated with a good long-term survival and a marked improvement in haemodynamics. There is a significant improvement in pulmonary artery pressure after endarterectomy in patients of chronic pulmonary thromboembolism.

ECMO as a last resort in severe covid pneumonia—our experience

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Abstract:
BACKGROUND:
Extracorporeal membrane oxygenation (ECMO) has been recommended for treatment of severe acute respiratory distress syndrome (ARDS) patients of COVID-19. The efficacy of veno-venous extracorporeal membrane oxygenation (VV-ECMO) in patients with severe ARDS is controversial. This study focuses on the experience and challenges faced by our institute during the second wave of COVID-19 when we initiated ECMO for severe Covid pneumonia (CT Severity Score, CTSS >18) as a last resort for the management of refractory hypoxia.

MATERIAL & METHODS:
This is a single centre retrospective study including 4 patients of severe COVID pneumonia with CTSS ranging 18-25 on full support mechanical ventilation. ECMO was instituted based on three criteria: (a) Arterial Blood Gas showing Acidosis (pH < 7.3), Hypercarbia (paCO2 > 60mmHg), Hypoxia (paO2 < 60mmHg) and PaO2/FiO2 ratio < 0.6 for more than 3 hours on full support mechanical ventilation (FiO2 of 100%), (b) Age < 50yrs, young previously healthy individuals with no associated co-morbidities or end-organ damage and (c) not more than 5 days on ventilator support. These patients were given VV-ECMO and primary end point was mortality within 30 days of initiation.

RESULTS:
Out of a total of four patients, one survived and three died (75% mortality). Pulmonary complications were present in all patients as all required ICD insertion for bilateral pneumothorax and two suffered alveolar haemorrhage. Neurologically two patients were declared brain dead and required withdrawal of support. One (the survivor) developed spontaneous gall bladder perforation which required cholecystectomy post ECMO. 1 patient went into Disseminated Intravascular Coagulopathy with multiple splenic and hepatic infarcts, for which change of circuit was required due to clot formation in membrane.

CONCLUSION:
Early initiation of ECMO had better outcomes. Patients should be seriously considered for ECMO as soon as they meet ventilatory criteria as detailed above, as any delay thereafter would cause prolonged tissue hypoxia with poorer outcomes. This is borne out by the fact that the sole survivor in our series was initiated on ECMO early in the course of his illness. It is recommended that patient should be RT-PCR negative prior to initiation and detailed neurological assessment should be carried out for better outcome.

Early Outcomes of Surgical Repair of Post Infarct Ventricular Septal Rupture
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Abstract:
Keywords: mechanical complication, myocardial infarction, ventricular septal rupture, early mortality, surgical repair

Aim and Objective:
Ventricular Septal Rupture (VSR) is a fatal mechanical complication of myocardial infarction. The aim of this study is to evaluate the early outcomes of the surgical repair and also to identify the risk factors related to early mortality at our centre.

Materials and Methods:
It is a retrospective study that includes the assessment of clinical data of 8 adult patients with post infarct VSR who underwent surgical repair at our centre. The study duration was between January 2017 and December 2021. All the patients included in the study underwent surgical repair of Post infarct VSR.

Results:
The median age of the patients was 68 years (Range 52-77 years). The most common location of VSR was predominantly in the anterior and apical septum (62.5%). The overall early mortality in our study was 50% (n=4). The risk factors and preoperative complications were similar among the survivors and non-survivors.

Conclusion:
Post infarct ventricular septal repair has high early operative mortality. It is difficult to predict the risk factors contributing to the high rate of early mortality in these patients.

Early outcomes after cardiac surgery in covid-19 recovered patients
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Abstract:
Ever since the first case of COVID 19 was reported in December 2019 in Wuhan, China, uncertainties have existed regarding what are the outcomes of the disease; as its presentations are quite varied ranging from asymptomatic patients to severe acute respiratory distress syndrome needing ventilation with or without prone and even ECMO. Poor outcomes have been reported regarding patients having recovered from COVID undergoing any surgery. However, no studies exist regarding the timing of surgery, factors affecting peri-operative and post-operative management and outcomes in patients undergoing cardiac surgery after having recovered from Sars-CoV-2 infection.

Aim of the study:
To analyze the early outcomes of COVID-19 infection recovered patients undergoing elective cardiac surgery. The primary outcome observed was the 30-day mortality and the Major Adverse Cardiac and Cerebrovascular Events (MACCE) following surgery. The secondary outcomes observed were duration of ICU stay and total length of hospital stay

Materials and Methods:
This was a single tertiary care centre, observational, descriptive, retrospective study from prospectively collected hospital data. During the period 1st September, 2020 to 31st October, 2021, we operated on 1188 adult patients undergoing any surgery. However, no studies exist regarding COVID undergoing any surgery. Poor outcomes have been reported regarding patients having recovered from COVID undergoing any surgery. However, no studies exist regarding the timing of surgery, factors affecting peri-operative and post-operative management and outcomes in patients undergoing cardiac surgery after having recovered from Sars-CoV-2 infection.

Results:
The mean and median duration of ventilation in our study group was 621 minutes (10.35 hours) and the median duration was 532 minutes (8.8 hours). 12 patients (19.4%) required non-invasive ventilation and 7 (11.2%) required high flow nasal cannula post extubation. The mean and median duration of ICU stay was 2.71 days and 2 days (2-6 days) respectively and the majority of them - 41 patients (66.12%)
AIMS / OBJECTIVES:

Double Chambered Left Ventricle (DCLV) is an extremely rare condition with not much literature available for its management. In DCLV, the left ventricle (LV) is divided into the main left ventricular chamber (MLVC) and an accessory chamber (AC). These two chambers are usually separated by either a distinct septum or a muscle band with abnormal proliferation, thus dividing the left ventricle into two distinct chambers. Since only few case studies have been published in literature, the pre-operative imaging, intra operative and post-operative management has been described in the past as isolated single case reports. We at our institute have had good results with the management of two such cases of DCLV. Both of our patients were diagnosed preoperatively with the help of 2D echocardiography, second patient additionally underwent a cardiac MRI for academic purpose. Despite being varied in presentation, both of our patients had an uneventful perioperative period and were discharged in stable condition.

CONCLUSION:

Double Chambered Left Ventricle (DCLV) is a condition which is not very well defined in literature, with very few describing it during the ante-mortem period. Thus we would like to share our experience of successful management of two such cases of Double Chambered Left Ventricle.

RESULTS:

Both the cases of DCLV we had were diagnosed incidentally and they were subjected to surgery with the help of extracorporeal circulation. We present the methodical management of the two cases with good surgical outcomes.

MATERIAL AND METHODS:

The proximal AVFs had only a 5% maturation failure (3 patients) cases as compared to the 13.8% (9 patients, 7 early & 2 late failures) in distal AVFs with mean time for maturation being 1.5 months and 2-2.5 months, respectively. The overall primary patency rates at 12 months were 98% for proximal AVFs and 74% for distal AVFs.

CONCLUSION:

The Proximal A-V fistulas for MHD were found to have early complications were analysed in the immediate and late postoperative period. These 130 cases were performed over a span of 6 months with regular follow up and observation for the next 12 months.

RESULTS:

The proximal AVFs had only a 5% maturation failure (3 patients) cases as compared to the 13.8% (9 patients, 7 early & 2 late failures) in distal AVFs with mean time for maturation being 1.5 months and 2-2.5 months, respectively. The overall primary patency rates at 12 months were 98% for proximal AVFs and 74% for distal AVFs.
Descending thoracic aorta to bifemoral bypass grafting in aorto-biliaic occlusive disease - single centre experience of eight years

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Abstract:
Aims:
The standard method of aortoiliac re-vascularization for occlusive disease is through a transabdominal approach. When this option is not feasible, descending thoracic aorta-bifemoral bypass grafting is a good alternative. The purpose of this study was to evaluate the effectiveness and results of the descending thoracic aorta as an inflow source for aortoiliac re-vascularization in cases where transabdominal approach was considered to be hazardous.

Method:
The aim of study is to describe the clinical symptoms, investigation findings and surgical treatment of aortoiliac occlusive disease where abdominal approach not feasible or not possible for aorto-bifemoral bypass grafting. From May 2013 to May 2021, twenty patients were treated with descending thoracic aorta-bifemoral bypass for aortoiliac occlusive disease at Grant Medical College and J J group of Hospitals, Mumbai (Maharashtra). Total 40 limbs were re-vascularized. Demographic data, co-morbid factors, per-operative findings were noted. Indication for surgery was juxta-renal occlusion of the abdominal aorta, in most of the cases.

Results:
No mortality. Mean duration of surgery was 2.5-5 h and mean blood loss was 250 - 400 ml. Major morbidity included one graft occlusion. None of the patients developed proximal propagation of aortic thrombus. Ulcers showed healing.

Conclusion:
Some authors have recommended supra-celiac aorta bypass surgery within the retroperitoneal space for juxta-renal aortic occlusive disease but is technically difficult and associated with morbidity. The major limitation to thoracic aorta bifemoral grafting technique is the morbidity rate associated with thoracotomy in a relatively high-risk vascular surgery population. Our series demonstrated superior inflow, excellent quality of life, and more reliable patency with thoraco-bifemoral bypass. This approach is recommended in selected patients when conventional approaches to the abdominal aorta are considered hazardous.

Correlation of coagulopathy and frozen elephant trunk use in aortic arch surgery: A systematic review and meta-analysis
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5Barts and The London School of Medicine and Dentistry, Queen Mary University of London, London, UK.

Background and aims:
The advent of frozen elephant trunk (FET) for reconstruction of elective and non-elective aortic arch surgery has augmented the treatment of complex aortic pathologies in a single-stage operation. To date, no studies have been focused on the prevalence and predictors of coagulopathy potentiated by FET procedure.

Materials and methods:
In a systematic review, we searched databases up to June 2020 to find studies reporting coagulopathy complications after FET procedure. A proportional meta-analysis was carried out using STATA software (StataCorp).

Results:
A total of 46 studies consisting of 6313 patients were eligible. The pooled estimation of reoperation for postoperative bleeding was 7% (95% confidence interval [CI]: 5-8; \( I^2 = 84.73\% \); reported by 39 studies including 4796 patients). The mean volume of transfused packed blood cells and fresh frozen plasma was 1677 ml (95% CI: 1066.4-2287.6) and 1016.5 ml (95% CI: 450.7-1582.3). The subgroup by the stent type showed a decrease in the heterogeneity (\( I^2 = 0.01\% \), \( I^2 = 53.95\% \), \( I^2 = 0.01\% \), and \( I^2 = 54.41\% \) for Thoraflex® Hybrid, E-vita®, Frozenix®, and Cronus®, respectively). The subgroup by the chronicity of operation resulted in less heterogeneity among patients undergoing elective compared with non-elective operation (\( I^2 = 29.22\% \) vs. \( I^2 = 80.56\% \) in non-elective). Meta-regression analysis showed that age and male gender significantly impacted on the reoperation for postoperative bleeding.

Conclusions:
The FET procedure for arch replacement is associated with coagulopathy complications and the transfusion of blood products. Male, age, and selective choice of FET use were found to be the heterogeneity sources of reoperation for postoperative bleeding.

Comparative study of outcomes in radiocephalic fistulas in ESRD patients
Feroze Mohammad Ganai

Abstract:
Keywords: Hemodialysis, radial artery, cephalic vein, radiocephalic fistulas, proximal wrist crease.

Aims/Objectives:
Chronic kidney disease (CKD) is a progressive dysfunction of kidneys. Many patients of CKD ultimately develop end stage renal disease and require hemodialysis. Surgically created arteriovenous fistulas are the gold standard for vascular access for hemodialysis. Non dominant upper limb is commonly used for the creation of arteriovenous fistula. Radiocephalic fistula (RCF) is the first recommended access because of its advantages but failure rate is higher. Aim of this study was to compare the failure rates in radiocephalic fistulas created ≤ 5cm and > 5 cm from the proximal wrist crease.

Materials and Method:
This prospective study was carried out in a tertiary care hospital. 238 radiocephalic fistulas were created in the patients of CKD with end stage renal disease over a period of 3 years and 2 months from September 2017 to November 2020. Patients were clinically evaluated and examined for radial artery and cephalic vein in forearm. Those patients who had apparently small veins were advised duplex ultrasonography to check the size and confirm the patency of vessels. After the successful creation of arteriovenous fistulas, patients were followed up for 1 year.

Results:
58 (23%) Radiocephalic fistulas failed. This result was obtained by examining all the patients for 1 year on regular intervals after the successful creation of access. This included patients from both sexes and age groups starting from 14 years upto 89 years. 31 (13%) fistulas failed in the 1st month of creation which is more than half which failed for the next 11 months. 38 failed radiocephalic fistulas were made ≤5cm from proximal wrist crease and 19 were those which were made at >5 cm distance. This coincidentally gives a 3:2 ratio.

Conclusion:
Radiocephalic fistulas made at ≥5 cm distance from proximal wrist crease failed less compared to those which were made at <5 cm
distance. Generally radial artery and cephalic vein have larger diameters and better flow dynamics at >5 cm. Also wrist movements have a lesser effect on anastomosis because of greater distance from the wrist joint. From this study radiocephalic fistulas made farther away from the wrist joint is a preferred method of creating radiocephalic fistulas.

Commando and Bentall procedure for fungal infective endocarditis

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Abstract:
Background: We present management issues that we faced in treating a 15 year old boy with severe AR and MR who presented with early fungal infective endocarditis post double valve replacement.

Case Presentation: A 15 year old male was transferred from another center with symptoms and signs of cardiac failure. His 2D echocardiography showed severe MR and AR due to non-coaptation. The history was for about 2 weeks and there was moderate grade fever initially which was absent at the time of presentation. He had bilateral pleural effusions and pedal edema, he was treated with intercostal drainage, diuretics and inotropes with improvement in clinical signs. He was on ventilator when he presented to us, and though there was improvement in clinical signs, he continued to be on ventilator and inotrope dependent which made us proceed with urgent high risk surgery. During surgery the valves were noticed to be inflamed with loss of leaflet tissue- both aortic and mitral leaflets appear inflamed and it appeared that any repair would be difficult and his valves were replaced with 19 and 25 mm Size TTK aortic and mitral valve respectively. His initial post-operative course was one of steady improvement and he was discharged on day 10. He presented to us after one month with low grade fever, at this time the prosthetic valve functions appeared normal and he was started on low dose steroids after initial negative blood culture. Even after one month he continued to be unwell, with low grade fever, echo showed thickening of inter-valvar fibrous body and there was partial dehiscence of aortic valve, he was admitted and cultures this time yielded Candida and he was requiring inotropes to maintain his hemodynamics. He was planned for very high risk reoperation for fungal endocarditis.

Surgery: During reoperation, the annulus of both the mitral and aortic valves and the fibrous body appeared destroyed by the vegetations. After thorough debridement the valves were replaced using continuous polypropylene suture and bovine pericardium to replace the mitral annulus and the LA roof, the coronary buttons were mobilized and the aortic root was reconstructed using a valve sutured to a bovine pericardial roll with a 5mm skirt which was used to suture the valved conduit to the aortic annulus and reimplanting the coronary arteries. The bleeding was controlled with roller gauze and he had uneventful closure of the sternum the next day, he was weaned off ventilator and inotropes. His histopathology and cultures grew mucor and candida, which was treated with antifungals. He continued to improve and he was transferred to another facility was continuing the antifungal therapy. His appetite continued to improve and Echo showed normally functioning prosthetic valves, he continued to have hypokalemia (2.5- 3mmol/l) which was being treated. After 3 weeks of intravenous Amphotericin-B, he was planned to be shifted to oral Posaconazole. He was shifted to a step down facility and was about to be discharged. He developed sudden onset breathlessness and ventricular fibrillation which was recalcitrant to resuscitation, autopsy could not be conducted due to unwillingness of the attenders.

Conclusion: Early fungal endocarditis following double valve replacement is reported during the midst of COVID pandemic, though the RT PCR was negative, the patient developed Mucor and Candida infection of prosthetic valves. Carefully supervised and monitored aggressive medical therapy is equally important as surgical debridement and therapy to avoid late catastrophes.

Clinical outcomes of McGoon’s imbrication of Flail Posterior Mitral Leaflet Prolapse

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Abstract:
Keywords: Rheumatic, Mcgoon, Flail, Imbrication, NYHA

Introduction – Mitral Valve (MV) disease is the commonest valvular heart disease encountered in our country. MV repair is considered superior as it avoids anticoagulation and has a low potential for long term complications . We present a retrospective study of the MV repair by Mcgoon’s imbrication for flail PML done in our hospital

Method- Retrospective study done in 70 patients during the time period of (Jan 2015-Feb 2021) operated by a single surgeon in the same institute .

Inclusion criteria – All patients above 18 years who were candidates for MV repair with diagnosis of flail PML with prolapse.

Exclusion criteria – Associated IHD, redo surgery, patient not willing for repair.

Results - Primary endpoint was successful MV repair.
Mean age was 35.64+/-.84 years, male female ratio 3:1.
Intra-op – CPB mean time was 80min, clamp time mean was 55min, In Post-operative TEE 93% had no MR, rest had mild MR, Mitral Valve Orifice Area (MVOA) post repair at mean of 2.5cm square
Follow up - at 6 months 92.3% showed significant improvement in NYHA Grade of breathlessness to grade 1 and the rest with NYHA grade 2, Post-operative mortality was 6.2%

Conclusion - MV repair with Mcgoon imbrication was considered to play an important role in managing flail PML and is technically simple and requires less experience on the imbrication stitch, as the learning curve is short and is beneficial to patients.

Clinical and radiological features of Type A Aortic Dissection: A retrospective observational study

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Abstract:
Keywords: Type A aortic Dissection, Demographics of Dissection, Radiological features of dissection
Carotid Body tumours
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Abstract:
Objective:
Carotid body tumours are rare and highly vascular neoplasms originating in the paraganglionic cells of the carotid bifurcation. The treatment is surgical excision. We studied the clinical profile, surgical outcome and complications of carotid body tumour patients.

Material and methods:
A total of 72 patients were studied prospectively and retrospectively. Diagnostic tools were FNAC, CT/MR Angiography.

Results:
Majority were females (48). Commonest age was 50 to 59 years. All had visible neck swelling of varying size. 91% patients had unilateral and remaining had bilateral lesions. Pain was present in 11, dysphagia in 6 patients. CT Angiography was done in 70.83% cases, MRA in 9.44% and both CTA and MRA in remaining cases. All cases underwent complete excision. Mean operating time was 90 minutes. Of all, 17 (23.61%) had Shamblin grade I, 46 (63.88%) had grade II and 9 (12.5%) had Shamblin grade III. ECA repair was done in 5 cases (6.94%), ICA repair with interposition graft in 2 patients (2.7%) and ECA ligation in 1 case. Postoperatively, 3 cases went to radiotherapy in view of being extensive or leaving residual tissue. No case had any long term neurological sequel postoperatively.

Conclusion:
Meticulous sub-adventitial dissection and excision is key to achieve complete cure with minimal morbidity. These tumours should be operated upon by experienced vascular surgeons to minimise complications.

Carotid Myxomas - symptomology, investigations and surgical treatment
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Abstract:
Aims:
The aim of study is to describe the clinical symptoms, investigation findings and surgical treatment of carotid myxomas.

Method:
From May 2013 to May 2021, 52 patients of primary or recurrent intracarotid myxoma underwent surgical excision at our institute. Their age ranged from 25 years to 55 years. Out of which 20 were males and 32 females. Commonest presenting symptoms were dyspnoea and palpitation. There were 37 Left atrial,13 Right atrial, one right ventricular and one left ventricular myxomas. The diagnosis was made by transthoracic and transesophageal echocardiography. Complete wide excision with a margin of 3-5 mm normal surrounding tissue was the main principle of surgery. Right atriotomy, right ventricular and left ventricular surgical approaches were used. Post-operative echocardiogram was done in all patients before discharge. Maximum follow-up of five years and minimum follow-up of 6 months was done after surgery.

Results:
There was no mortality. On follow-up after five years of surgery, all patients were in NYHA class 1 and their echocardiography showed good ventricular function with normal pulmonary artery pressure with patch in situ. In one of the patient, right atrial myxoma developed after five years of first surgery for left atrial myxoma, which was also excised.

Conclusion:
We recommend right atriotomy approach for both right and left atrial myxomas, right ventricle approach for right ventricular myxoma and left ventricular for left ventricular myxoma. Bialtrial approach is recommended for large and unusually located left atrial myxoma. To prevent recurrence, surgical excision must include a substantial portion of normal surrounding tissue near the base of implantation. With proper surgical technique, both mortality and recurrence are rare with complete recovery.

Biocemical Markers In Beating Heart Surgery of ASD
Feroze Mohammed Ganai

Abstract:
Keywords: ASD repair; beating heart surgery; aortic cross clamp; biochemical markers; normothermic perfusion.

Aims/Objectives:
Creatine phosphokinase-myocardial band fraction (CPK MB) and cardiac Troponin I (Troponin I) are cardiac specific biochemical markers which are raised in myocardial ischemia. The aim of the study was to determine and compare the levels of cardiac enzymes CPK MB and Troponin I in ASD patients in whom operative repair was done under cardiopulmonary bypass using beating heart technique with continuous normothermic perfusion with and without the application of aortic cross clamp.

Material and Method:
This is a prospective study carried out in the Department of Cardiothoracic and Vascular Surgery at a Tertiary Care Hospital over a period of 2 years. Total atrial septal defect (ASD) patients in whom operative repair was done under cardiopulmonary bypass using beating heart technique was 60. Aortic cross clamp was applied in 22 patients (Group A) during the procedure and in 38 patients (Group B) Aortic cross clamp was not applied. 24 hours before and 12 hours post procedure blood samples were sent for the estimation of CPK MB and Troponin I levels.
Results:
Mean age of the patients was 23.83±10.97 years. 60% of the patients were females. 24 hours prior to surgery CPK MB and Troponin I levels in all the patients were in normal range. 12 hours post surgery mean CPK MB and Troponin I levels in Group A patients were 56.39±23.55 U/L and 9.37±4.97 ng/ml and in Group B patients were 34.38±15.97U/L and 5.92±4.17ng/ml respectively.

Conclusion:
ASD patients in whom repair was done with aortic cross clamp applied during the procedure, CPK MB levels and Troponin I were significantly higher at 12 hours after the surgery compared to the patients in whom aortic cross clamp was not applied. Greater levels of these cardiac biochemical markers implies more ischemic injury to the heart.

Berry syndrome: A rare aortopulmonary malformation – a case report.
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Abstract:
Keywords: Berry syndrome, Aortopulmonary window, Interrupted Aortic Arch.
Aim / Objectives:
We present a case of Berry syndrome, characterized by distal aortopulmonary window, aortic origin of right pulmonary artery, hypoplastic or interrupted aortic arch, and intact interventricular septum.

Material and Methods:
A 9 month female child weighing 5kg was identified to have large aortopulmonary window with bidirectional shunt, moderate tricuspid regurgitation with pulmonary arterial hypertension. On subjecting to cardiac catheterization, it was found to have Berry syndrome with pulmonary arterial hypertension and was found to be reversible. The patient was taken up for surgery and a single stage primary repair was performed.

Results:
A successful single-stage surgical repair of Berry syndrome; with closure of aortopulmonary window, repair of interrupted aortic arch and augmentation of aortic arch; anastomosis of right pulmonary artery to main pulmonary artery, and tricuspid valve repair. Echocardiography at discharge demonstrated no residual APW, aortic arch continuity without any gradient, unobstructed RPA flow and pulsatile flow in abdominal aorta, mild TR, RVSP=38mmHg, good biventricular function, LVEF=60%.

Conclusion:
Berry syndrome is an extremely rare aortopulmonary malformation, which can be definitively diagnosed with prenatal fetal echocardiography and neonatal TTE which warrants prompt and early surgical management with resultant good outcomes. Surgical management can be tailored according to the patient presentation in staged or single staged procedure. Post-operative PAH crisis is a known complication which can be successfully managed with pulmonary vasodilator therapy in most of the cases.

Avascular Necrosis of Femur head in Post Heart Transplant Recipients.
Azaria JP, Sahu MK, Singh SP, Hote MP, Seth S
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Abstract:
Patients lose bone mineral density (BMD) rapidly after solid organ transplantation mainly due to steroids in the immunosuppressive therapy (IST). This may cause orthopaedic complications in the form of osteoporosis, fractures and Avascular Necrosis (AVN) of femur head. Bone resorption occurs faster in the first 3-6 months after transplantation with slowing thereafter. The fracture rates are highest in patients with lower pre-transplant BMD. Pre-transplant osteoporosis is a predictor for fracture. The incidence of fracture decreases as bone loss slows 6 to 24 months after transplantation. 79 patients have undergone Orthotopic Heart Transplantation (HTx) at our centre. 29 are under regular follow up, of whom 6 patients have bone related complications, among whom 4 have bilateral AVN of femur heads. All 4 of them presented with pain in the hip joint and inability to walk/stand. Pain relief was incomplete in spite of multimodal analgesics including Gabapentine. 3 of them underwent
decompression surgeries due to severity of AVN severely affecting their daily activities, while 1 patient is being managed conservatively. Remaining 2 patients are diagnosed with osteoporosis and are on medication and being followed up regularly. Among them 1 patient had a fracture of right tibia due to a trivial fall and underwent surgery. Studies have shown that lumbar spine BMD begins recovery within 3 years and often returns to baseline, whereas femoral neck BMD remains below baseline levels. Conservative management starts with rapid decrease in steroid therapy to minimal dosage along with other adjuvant therapy to prevent bone resorption. The available treatments are – Bisphosphonates, Vitamin D3 and Calcium supplementation, symptomatic relief with analgesics and regular physiotherapy.

Orthopaedic complications are a major morbidity post-HTx because they affect quality of life significantly in otherwise normally functioning heart due to severe locomotor restrictions. Hence an ideal management would be to screen all the recipients pre-transplant with a DEXA scan and treat those with Low BMD. And post-transplant it is ideal to decrease and stop steroids from the IST and prophylactic administer Bisphosphonate, Vitamin D3 and Calcium supplementation in post-transplant period.

Aortic valve replacement with the uniline pericardial bioprosthesis: mid-term results in multicenter study

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Abstract:

Purpose. The aim of this multicenter study was to analyze the immediate and long-term (up to 8 years) results of surgical treatment of aortic valvular disease with the application of “UniLine” epoxy treated biological prosthesis.

Material and methods. From 2011 to 2019 From 2011 to 2019, 483 patients with an average age of 69.6 ± 6.3 years (36-85 years). 53% of men, were operated on for aortic valve disease in five cardiac surgery centers of the Russian Federation. The most common causes of aortic valve disease were degenerative changes (79%) and bicuspid aortic valve (8.5%). Aortic valve replacement in 22.6% of patients was supplemented by direct myocardial revascularization. Mitral and tricuspid valve plastic surgery was performed in 1.7 and 8.5% of patients, respectively. The volume of follow-up was 1,599.9 patient-years.

Results. Hospital mortality was 1.9% (n=9). Valvular-related events were not observed at the hospital stage. The actuarial survival rate was 92.6% by the 8th year of follow-up, the linearized survival rate was 1.94%/patient-years. There was no prosthetic-related mortality in the long-term period. There were 8 patients re-operated at a time of 2.9 ± 0.7 years. In all cases of dysfunction of the tissue prosthesis, there was prosthetic endocarditis. The linearized index of reoperations and prosthetic endocarditis was 0.50%/patient-years, respectively. The actuarial index of reoperations and prosthetic endocarditis was 97.6% by the 8th observation, respectively. One patient (12.5%) had a fatal outcome with repeated intervention.

The linearized and actuarial indicator of the absence of thromboembolic events was 0.50%/patient-years and 97.2% by year 8, respectively. The linearized and actuarial indicator of the absence of hemorrhagic complications was 0.25%/patient-years and 98.9% by year 8, respectively.

Conclusion. The use of the epoxy treated biological prosthesis “UniLine” in elderly patients with aortic valve diseases demonstrates high survival rates, low risk of dysfunction and, consequently, re-operation, as well as low risk of hemorrhagic and thromboembolic complications during the first 8 years after implantation.

Aortic valve replacement with 17mm mechanical prosthesis – our experience with 136 patients

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Krishna Institute of Medical Sciences, Rajahmundry, India

Abstract:

Objective: Various surgical techniques have been proposed to treat small aortic annulus. We aimed to determine the effectiveness of 17 mm mechanical aortic valve in such patients

Methods: Patients underwent aortic valve replacement with 17 mm mechanical aortic valve. Clinical status of the patient, pre and postoperative echocardiography were assessed. Patients were evaluated at 1 year after aortic valve replacement.

Results: NYHA functional class of the patients improved from 2.9/4.3 to 1.2/4.3. Ejection fraction increased from 59/4.12% before surgery to 64/7% at follow up. There was no operative mortality. A significant decrease in peak pressure gradient was found on early postoperative (26.7/7.3mm Hg) and at 1 year (25.2/8.2 mm Hg) follow up echocardiography compared to that in the preoperative period (101.2/36.5 mm Hg). No mortality was observed at 1 year follow up. Left ventricular Mass Index regressed to normal range in 63% of patients at follow up.

Conclusion: Patients who underwent AVR using 17mm mechanical aortic valve showed satisfactory hemodynamic and clinical outcomes.

Aortic Cuspial Reconstruction With Autologous Pericardium Using Locally Made Templates

Raja Suman Datta Aduri, Shyam K S Thingnam, Harkant Singh, Anand K Mishra, Vivek Jaswal
Post Graduate Institutes of Medical Education and Research, Chandigarh

Abstract:

Aims/Objectives: To assess the effectiveness of isolated Aortic cusp reconstruction with glutaraldehyde treated autologous pericardium in producing a competent aortic valve, performed in a series of 4 cases

Materials and methods: 4 patients underwent aortic cusp reconstruction with autologous pericardium in PGIMER Chandigarh from January 2020 to December 2021 and we have studied preoperative morphology on echocardiography, intraoperative parameters (CPB Time, Cross clamp time, affected Cusp) and post-operative parameters (coaptation height, mean gradient and effective orifice area)

Results: Out of 4 patients Aortic regurgitation was present in 3 patients and Aortic Regurgitation with Stenosis was present in one patient. In two patients LCC and RCC cusps were replaced and in two patients only LCC was
We propose the passage of a thick black braided silk SUTUPAK silk. 

Abstract:
Shweta Sharma
An Alternative Technique of Intraoperative closure of multiple muscular ventricular septal defects (VSDs) is associated with significant perioperative mortality, residual VSDs, ventricular dysfunction, and complete heart block.

Materials and methods:
We report the technique and results in 5 patients with multiple muscular VSDs with severe pulmonary arterial hypertension (PAH) using a No. 3 SUTUPAK silk suture through a transtricuspid approach. Clinical Summary Between January 2019 and May 2021, 5 patients underwent patch closure of multiple muscular VSDs by a single surgeon (Dr. Ujjwal Kumar Chowdhury) using the surgical technique described after informed written consent from their parents / guardians. Their ages at the time of operation were 2, 3, 4, 3 and 3 months respectively. Their weights were 3.2, 3.6, 4.0, 3.6, and 3.4 kg respectively. Two-dimensional color Doppler echocardiography demonstrated multiple VSDs with evidence of severe PAH. Intraoperatively, pulmonary arterial pressure (systolic/diastolic) ranged between 98/32 to 110/36 mmHg. Operative Technique We used a transtricuspid approach to close the multiple muscular VSDs in these patients.

Results-
Following intraoperative transesophageal echocardiography, blood samples were taken from the SVC and the pulmonary artery for oxyhemoglobinometry. It did not reveal any step-up of oxygen saturation in the pulmonary artery. Postoperative management included the use of inotropics and pulmonary vasodilators. Postoperative echocardiography revealed normalization of pulmonary arterial pressure, intact atrial and ventricular septa without any residual shunting. There were no early or late deaths on follow-up visit ranging from 18-20 months. Doppler echocardiography revealed normal biventricular function and absence of any residual VSDs with systemic arterial oxygen saturation ranging from 96%-99%.

Discussion:
The key to closure of multiple VSDs is accurate identification, edge detection, and proper cleft entry. The presence of numerous muscular trabeculations on the right-side of the ventricular septum creates uncertainties in defining the true edges of the VSD. Division of the moderator band and trabeculae have been performed to clearly define the margins of the VSDs. Although the use of an apical left ventriculotomy to improve exposure of VSD has facilitated more accurate repair, without late adverse sequelae in many series, several investigators have reported late apical aneurysm formation, ventricular arrhythmia, left ventricular dysfunction, and cardiac transplantation. In an effort to improve exposure of the margins of VSD without transecting the trabeculae or the moderator band, we railroaded the ducus silk suture through the apical VSD which facilitated placement of deep pledgeted sutures around margins of the VSD. It is true that this technique only works if each secondary VSD has been definitely identified by passage of the right angle forceps. However, in cases of true “Swiss-cheese VSDs”, it remains difficult to ascertain the true margins of all defects located within the right ventricular apex through the transtricuspid route, and this technique is indeed useful in cases of isolated multiple VSDs. We submit this technique as a useful addendum in the armamentarium of congenital heart surgeons dealing with multiple ventricular septal defects.

An Alternative Technique of Intraoperative Identification of Multiple Muscular Ventricular Septal Defects
Shweta Sharma
AIIMS, New Delhi

Abstract:
Aims and Objectives: We propose the passage of a thick black braided silk SUTUPAK silk suture (Ethicon, Somerville, NJ) through the additional muscular ventricular septal defects to facilitate patch closure of the multiple muscular ventricular septal defects. Despite advancements in surgical and interventional techniques, closure of multiple muscular ventricular septal defects (VSDs) is associated with significant perioperative mortality, residual VSDs, ventricular dysfunction, and complete heart block.

Materials and methods: We report the technique and results in 5 patients with multiple muscular VSDs with severe pulmonary arterial hypertension (PAH) using a No. 3 SUTUPAK silk suture through a transtricuspid approach. Clinical Summary Between January 2019 and May 2021, 5 patients underwent patch closure of multiple muscular VSDs by a single surgeon (Dr. Ujjwal Kumar Chowdhury) using the surgical technique described after informed written consent from their parents / guardians. Their ages at the time of operation were 2, 3, 4, 3 and 3 months respectively. Their weights were 3.2, 3.6, 4.0, 3.6, and 3.4 kg respectively. Two-dimensional color Doppler echocardiography demonstrated multiple VSDs with evidence of severe PAH. Intraoperatively, pulmonary arterial pressure (systolic/diastolic) ranged between 98/32 to 110/36 mmHg. Operative Technique We used a transtricuspid approach to close the multiple muscular VSDs in these patients.

Results-
Following intraoperative transesophageal echocardiography, blood samples were taken from the SVC and the pulmonary artery for oxyhemoglobinometry. It did not reveal any step-up of oxygen saturation in the pulmonary artery. Postoperative management included the use of inotropics and pulmonary vasodilators. Postoperative echocardiography revealed normalization of pulmonary arterial pressure, intact atrial and ventricular septa without any residual shunting. There were no early or late deaths on follow-up visit ranging from 18-20 months. Doppler echocardiography revealed normal biventricular function and absence of any residual VSDs with systemic arterial oxygen saturation ranging from 96%-99%.

Discussion:
The key to closure of multiple VSDs is accurate identification, edge detection, and proper cleft entry. The presence of numerous muscular trabeculations on the right-side of the ventricular septum creates uncertainties in defining the true edges of the VSD. Division of the moderator band and trabeculae have been performed to clearly define the margins of the VSDs. Although the use of an apical left ventriculotomy to improve exposure of VSD has facilitated more accurate repair, without late adverse sequelae in many series, several investigators have reported late apical aneurysm formation, ventricular arrhythmia, left ventricular dysfunction, and cardiac transplantation. In an effort to improve exposure of the margins of VSD without transecting the trabeculae or the moderator band, we railroaded the ducus silk suture through the apical VSD which facilitated placement of deep pledged sutures around margins of the VSD. It is true that this technique only works if each secondary VSD has been definitely identified by passage of the right angle forceps. However, in cases of true “Swiss-cheese VSDs”, it remains difficult to ascertain the true margins of all defects located within the right ventricular apex through the transtricuspid route, and this technique is indeed useful in cases of isolated multiple VSDs. We submit this technique as a useful addendum in the armamentarium of congenital heart surgeons dealing with multiple ventricular septal defects.

Acquired Carotid-Jugular Fistulas
Following Carotid Endarterectomy:
A Narrative Review
HG Narroway, AS Tchen,
Gosford Hospital, Central Coast Local Health District (CCLHD), New South Wales, Australia

Abstract:
Introduction:
Acquired arterio-venous fistulas (AVF) involving the carotid artery are most commonly the result of trauma and iatrogenic causes such as catheterisation of the neck vessels. Left untreated, carotid-jugular fistulas
may precipitate ischaemic neurological symptoms due to thromboembolism or shunting of blood through the AVF, as well as high-output congestive heart failure secondary to increased venous return.

**Methods:**
A literature review was performed to determine the incidence of acquired carotid-jugular AVFs following carotid endarterectomy (CEA) and previously reported treatment for this complication. Electronic searches were performed using three databases, PubMed, EMBASE, and Google Scholar, and used four search terms: ‘arterio-venous fistula’, ‘carotid-jugular fistula’, ‘carotid endarterectomy’, and ‘acquired’, and relevant keyword terms such as ‘endovascular’, ‘surgery’, ‘repair’, ‘complication’ and ‘delayed’. Inclusion criteria were all types of articles, articles published in PubMed, and related only to humans. Exclusion criteria were articles without full text and not in English. Additional references were searched for manually among cited references.

**Results:**
Three case studies met inclusion criteria for analysis. The first case reported an 85-year-old male presenting with weakness and loss of sensation in his right hand, 4 months following a left-side CEA procedure. Imaging with CT angiography and duplex ultrasound identified a pseudoaneurysm arising from the proximal internal carotid artery (ICA). A CJF was subsequently identified intra-operatively and the patient underwent carotid ligation following unsuccessful attempts to repair the defect. The patient has ongoing mild dysphonia and no other complications at 18 months follow-up.

The second case reported a 66-year-old male presenting with amnesia, ataxia and fatigue and a history of right-side CEA performed 6 years prior. Catheter angiography revealed an AVF between the right external carotid artery (ECA) and internal jugular vein (IJV), treated with access via the contralateral IJV using coil embolization. The patient made a complete neurological recovery and had no further complications at 2 years follow-up.

The third case reported an 87-year-old male presenting with pulsatile tinnitus and fullness around the right parotid region, 4 years following a right CEA. Catheter angiography identified multiple discrete branches between the lingual branch of the right ECA and the right retromandibular vein, treated with trans-arterial particle embolization via the ECA. The patient made a complete neurological recovery and was discharged to the community after 2 weeks.

**Conclusion:**
Carotid-jugular AVFs are rare following CEA and proceduralists should be cognisant of this delayed complication. This review proposes that carotid-jugular AVFs may be amenable to both open and endovascular intervention with durable outcomes. Larger series with long-term follow-up are required.

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**Abstract:**
**Background:** The global prevalence of heart failure is approximately 65 million cases, and is expected to rise as the world population ages. For suitable candidates with advanced and refractory heart failure, heart transplant (OHT) remains definitive therapy and can significantly extend survival and improve function and quality of life. A lack of donor organs has led to the development of left ventricular assist devices (LVAD). These devices can be utilized as either a bridge-to-transplant (BTT) or as an alternative to heart transplantation. LVADs can prolong and improve quality of life, however they are associated with a significant number of adverse events.

**Methods:** A systematic review was performed to determine outcomes following implantation of a cf-LVAD. Primary outcomes were survival and frequency of adverse events (such as bleeding, infection, thrombosis, stroke and right ventricular failure). Secondary outcomes included quality of life and assessment of functional status.

**Results:** 63 studies reported clinical outcomes of 9,280 patients. Industry-funded trials reported generally superior overall survival compared with case series. The largest registry report documented 12, 24 and 48-month survival rates of 82%, 72% and 57% respectively. Bleeding, right-heart failure (RHF) and infection were the most frequent adverse events, occurring in up to 35%, 40% and 55% of patients, respectively. Quality of life as measured using the Kansas City Cardiomyopathy Questionnaire (KCCQ) and functional status as measured with the 6-minute walk test (6MWT) improved after cf-LVAD implantation with no decline evident 2 years after implantation.

**Conclusions:** Scarcity of donor hearts has led to the development of LVADs as a BTT or as a destination therapy (DT). Short-term survival following cf-LVAD implantation is comparable to heart transplantation. Long-term survival remains limited due to the incidence of post-implantation adverse events. Despite these complications, quality of life and functional status improve significantly post-implantation and remain improved over the long-term. This study demonstrates the potential benefits of cf-LVAD therapy.

**A study to compare the effects of open and closed endotracheal suction systems on the haemodynamic parameters among cardiac surgery patients in intensive care unit.**
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**Abstract:**
**Objectives:** Two standard methods for clearing endotracheal secretions are available: The open and closed suctioning systems. The open suction technique is performed by disconnecting the ventilator circuit from the patient’s endotracheal tube and closed suctioning system is performed by positioning a catheter between the endotracheal tube and the Y-piece of the ventilator circuit and the patient does not get disconnected from the ventilator. The aim of the study was to compare the effects of open and closedendotracheal suction systems on the haemodynamic parameters among cardiac surgery patients in intensive care unit of PGIMS Rohtak.

**Materials and Methods:** In this prospective study quantitative approach and cross over experimental design were used in 102 patients during early postoperative period who underwent various cardiac surgical procedures. Same patients were assigned to Group A (open suction group) and Group B (closed suction group) by use of non-probability purposive sampling technique. Haemodynamic parameters were determined before suction, during suction, after 1 min and 10 minutes after suctioning. The data were evaluated with the One-Way Analysis of Variance (ANOVA) for Repeated Measures, unpaired t-test.
Results: In terms of HR, MAP and EtCO2, both the groups were comparable as there was not any significant difference between the groups. P value was found >0.05 at different intervals. Changes in SpO2 were more significant in open than in closed system with mean 97.28 (3.49) versus 99.22 (1.45) and P value 0.03 i.e. <0.05. It was also observed that there was no significant difference in terms of demographic variables and clinical profile as p value was >0.05 at different intervals.

Conclusion: It was determined that peripheral oxygen saturation of the patients in cardiothoracic vascular surgery intensive care unit were affected by the open suction system. Closed suction has the potential to improve patients’ hemodynamic condition.

A Randomized control trial at tertiary care centre: evaluation of safety and efficacy of topical vancomycin in prevention of sternal wound infection
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Abstract:
Introduction: Mediastinitis is a lethal complication and a challenge in post cardiac surgery patients. The study was aimed to evaluate the efficacy of topical vancomycin by applying it on the sternal edge to prevent deep sternal wound infection.

Objectives: Sternal wound infection is most dangerous complication after cardiac surgery. Prevention of sternal wound infection post cardiac surgery by using topical antibiotics is widely applied. Vancomycin is one of the most efficiently used local antibiotic for sternal wound infection prevention. It is bactericidal antibiotic effective against MRSA. In this study we aim at evaluation of safety and efficacy of topical vancomycin in prevention of sternal wound infection.

Methods: This was a randomised control trial conducted at PK Sen Department of CVTS, Seth GS medical college and KEM hospital. The duration of the study was 1 year (from 11/2020 till 10/2021) with sample size of 100 (50 Vancomycin group, 50 Control group) The Vancomycin group had local application of vancomycin paste prepared by mixing 1000mg of powder in 5 ml of normal saline and stirred until paste was formed and was applied before sternal closure. The control group had reinforced closure technique without vancomycin paste application. All cases were followed up for symptoms and signs of sternal wound infection during hospital stay and until 1 month.

Results: There was increased incidence of wound infection with control group as compared to vancomycin group, there were no wound infection in patients of vancomycin group.

Conclusions: Application of local sternal vancomycin significantly reduced poststernotomy wound superficial wound infection and prevented deep mediastinitis.

SVC Augmentation with in situ Right Atrial Tissue Advancement in Repair of Anomalous Pulmonary Venous Connections
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Abstract:
INTRODUCTION: SVC obstruction can be a significant complication in patients undergoing cardiac surgery. In a study, about two-thirds of reported cases of SVC obstruction among pediatric and young adult populations were from post-cardiac surgery. Among these, repair of
Does Myocardial Oxygen Extraction have any bearing on postoperative outcome and can it be a reliable predictor of same?
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Abstract:
Introduction: During cardiac surgery with heart arrested and aortic cross clamp on, heart suffers a variable degree of ischemia, and thus myocardial oxygen extraction (MOE) also varies with each cardioplegic dose. Does MOE have any bearing on postoperative outcome and can it be a reliable predictor of same?
Aims: To study the myocardial oxygen extraction as a predictor of postoperative outcome in valvular replacement surgeries of heart.
Materials and methods: 66 consecutive cases of valve replacement surgeries were included. Ischemic heart disease was ruled out in all. During surgery, Oxygen content of cardioplegic dose was ascertained at the aortic root and at coronary sinus, and MOE was calculated. Cases were divided into two groups: those with MOE more than 25ml% and others with less than 25ml%. Postoperative outcome was noted in each, viz a viz complications, hospital and ICU stay, morbidity and mortality. Statistical correlation was drawn.
Results: In general, those with MOE higher than 25ml% had a better outcome, marked by significantly less complications, ICU and hospital stay and mortality. Those with MOE less than 25ml% had a worse outcome in similar parameters.
Conclusion: Though high MOE was associated with a better postoperative outcome, more studies with bigger sample size need to be undertaken to validate the findings and establish MOE as a predictor of postoperative outcome.
aneurysm, and penetrating atherosclerotic ulcer (PAU) up to April 2019 was gathered and is presented herein. Follow-up data at discharge, 3-, 6-, 12-, 24-, 36-, 48-, 60-, 72-, and 84- months post-implantation are included.

**Results:** Data associated with 931 cases of Thoraflex™ Hybrid implantation are included. Mean age at implantation was 63 ± 12 years. 55% of patients included were male. Aortic dissection accounted for 48% (n = 464) of cases. Mean cardiopulmonary bypass and circulatory arrest durations were 202 ±72 and 69 ± 50 min, respectively. 30-day mortality was 0.6% (n = 6), while overall mortality was 14 (1.5%). Freedom from adverse events at 84 months was 95% (n = 869). Postoperative complications included neurological deficit, multi-organ failure, cardiorespiratory compromise, and infection.

**Conclusion:** Thoraflex™ Hybrid remains a central player in the aortic arch prosthesis market as its unique design is advantageous in comparison to market alternatives. Our data is consistent with that reported in literature and suggests Thoraflex™ Hybrid is associated with favourable rates of mortality and morbidity.

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