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HealthNews DIGEST

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Welcome to the momentous 10th edition of our HealthNews Digest. It is a joyous occasion as we celebrate this milestone and the remarkable journey we have undertaken together.

As we reflect on the past editions, we are reminded of our unwavering commitment to raise healthcare standards. I would like to express my heartfelt appreciation to the exceptional doctors whose contributions have made this newsletter a trusted resource. Your expertise and dedication continue to shape the healthcare landscape, inspiring us all to strive for excellence.

Furthermore, I am pleased to announce that the Aster Guardians Global Nursing Award, 2023, has been successfully conducted. This distinguished accolade is a tribute to our nursing professionals' exceptional efforts, recognizing their invaluable contributions in delivering compassionate and exemplary care.

Together, let us embrace this milestone with gratitude, determination, and a renewed focus on improving healthcare standards. With your support and the collective efforts of our healthcare community, we can create a brighter future for all.

Dr. Ramanathan V

Medical Director
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It gives me great pleasure to welcome you to the 10th edition of our HealthNews Digest. I am proud of the collective efforts we have made to raise healthcare standards to new heights.

I am continuously inspired by the unwavering commitment of our doctors to maintain and improve healthcare standards. Their tireless efforts in advancing medical knowledge, sharing expertise, and providing exceptional patient care are the cornerstone of our success.

At Aster, we firmly believe that by fostering innovation, embracing technology, and promoting collaboration, we can shape a future where healthcare is universally equitable and exceptional.

I extend my deepest appreciation to our esteemed doctors for their invaluable contributions to this edition and their unwavering commitment to elevating healthcare standards. Together, we will continue to make significant strides in delivering excellence and improving the health and well-being of our communities.

Laparoscopic Removal of 2.5 kg Uterus

Successful Removal of 2.5 kg Uterus with Total Laparoscopic Hysterectomy (TLH) at Aster Hospital, Mankhool

Dr Sejal Devendra Surti
Laparoscopic Gynaecology (Specialist)

PRESENTATION

- 48 year old unmarried female
- Admitted with:
  - Complaints of heavy menstrual cycles with clots for the last three months
- Medical history of hypertension, undergone fibroadenoma excision in childhood and breast cyst aspiration 10 years back
- Patient's mother has history of diabetes mellitus and hypertension

FINDINGS

During Examination:

- Stable vitals
- Abdomen mass of 20 weeks gravid uterus size

Ultrasound revealed:

- Uterus of 131x119x101 mm size with normal appearing uterine myometrium
- The large posterior myometrial fibroid measuring 12x10 cm and was seen significantly compressing and displacing endometrium anteriorly.

DURING PROCEDURE

The patient underwent Total Laparoscopic Hysterectomy with Bilateral Salpingo-Oophorectomy under general anaesthesia.

- Due to the large size of uterus, supraumbilical port was considered for laparoscope.
- Uterus was enlarged to 20 weeks size with multiple fibroids.
- A stepwise hysterectomy was performed using LigaSure and Harmonic tools.
- Complete haemostasis was ensured.
- Specimen weighed 2.5 kg; was removed by morcellation.

POST PROCEDURE

The patient tolerated the procedure well and was in a stable and satisfactory condition at the time of discharge.

DISCUSSION

Uterine Fibroids (leiomyomas or myomas) are the benign monoclonal tumours that are the most common benign tumours in women. Commonly reported symptoms include heavy menstrual bleeding, dysmenorrhea, noncyclic pain, urinary symptoms, fatigue, and constipation. In addition, people with uterine fibroids experience pain and may even develop infertility, significantly reducing their quality of life. Myomas range in size from microscopic to bulky masses that can distort and enlarge the uterus. Although, most of them are small; on rare occasions, myomas can grow extremely large (1).

Giant fibroids remain a diagnostic and surgical challenge, requiring expertise and interdisciplinary cooperation. Nevertheless, these gigantic benign tumours can be managed complication free with proper diagnosis and surgical expertise. The laparoscopic removal of giant uterine myomas is rare.

One of the major concerns over the morcellation of occult cancer is delayed diagnosis because of misinterpretation of the initial pathologic specimen and the possibility of the seedling of cancer throughout the peritoneal cavity. There are reports of power morcellation within an endoscopic bag (2), extracorporeal morcellation, and transvaginal insertion of the anchor tissue retrieval system. New surgical methods are being investigated so women with large uterine leiomyomata can still be offered laparoscopic surgery. Laparoscopy Assisted Supracervical Hysterectomy (LASH), when combined with the changeover technique (TLH & Laparoscopic Assisted Combined Hysterectomy (LACH)) makes the removal of the uterus of almost any size feasible. With the changeover technique, it seems possible to complete the dissection of the parametrium at the right side of the uterus without risk. The crucial advantageous aspect of this method is the improvement of visibility and access conditions (3).

Uterine fibroids, especially the massive ones, are associated with acute venous thromboembolism (VTE) and other complications due to the following reasons (4): the mass compression from large fibroids can lead to pelvic and lower limb venous stasis, abnormal menstruation, and excessive bleeding in patients with uterine fibroids cause polycythemia and reactive thrombocytopenia, leading to a higher risk of VTE (5).

CONCLUSION

TLH is a feasible and safe alternative to traditional Total Abdominal Hysterectomy (TAH) for large uterine fibroids, as it can effectively improve a patient's quality of life. In addition, laparoscopic approach contributes to quick recoveries and short hospital stays, reduces the postoperative inflammatory response and blood loss.

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Rotator Cuff Repair Techniques

Current Concepts in Arthroscopic Rotator Cuff Repair Techniques

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A rotator cuff tear (RCT) is a relatively common cause of shoulder pain and weakness which can progress to pseudo-paralysis and osteoarthritis (1). The prevalence of RCTs increases with age and can affect up to 70% of those aged over 70 years (1). Many choose to have surgery due to disability or progressive symptoms (2). Over time, arthroscopic rotator cuff repair has become more common because it minimizes deltoid damage, allows for thorough glenohumeral joint visualization, and enables the detection of concurrent pathology (2).

Of note, the number of patients going for rotator cuff repairs is increasing drastically with good to excellent outcomes reported in the short- and long-term follow-up in most cases (3). However, despite improvements in instrumentation and surgical methods, a 20% to 60% risk of re-rupture has been noted (3). To cater to the increasing demand for optimization of clinical outcomes, attachment of the tendon back to the bone with minimal tension is required (2). This can be achieved by focusing on key biomechanical factors such as patient positioning, biomechanical principles, optimal visualization, and repair techniques for both anterior and posterosuperior tears (2).

Numerous biomechanical and clinical studies comparing different rotator cuff repair techniques have been published (3). It is essential for the orthopedic surgeon to have a thorough knowledge of the literature to apply the most appropriate technique in terms of healing and functional outcome (3).

PRINCIPLES GUIDING ARTHROSCOPIC ROTATOR CUFF REPAIR

1. Patient Positioning

- Both the lateral decubitus and beach chair positions can be used for rotator cuff repair, but each has its own challenges, benefits, and drawbacks which are detailed in Table 1 (2).
- In Lateral Decubitus, the patient is supported on a beanbag with the knees flexed and the head in a neutral position (2). The surgical arm is placed in a traction device with a rotating hinge that allows the shoulder to move freely in all directions (2).
- In the beach chair position, the patient is placed supine on a dedicated operating table which is maneuvered into the desired semi-sitting position (2,4). Key considerations include (2),
  - Placing a cushion beneath the knees prior to elevating the trunk
  - Maintaining neutral alignment of the head
  - Using a positioning device to control the arm

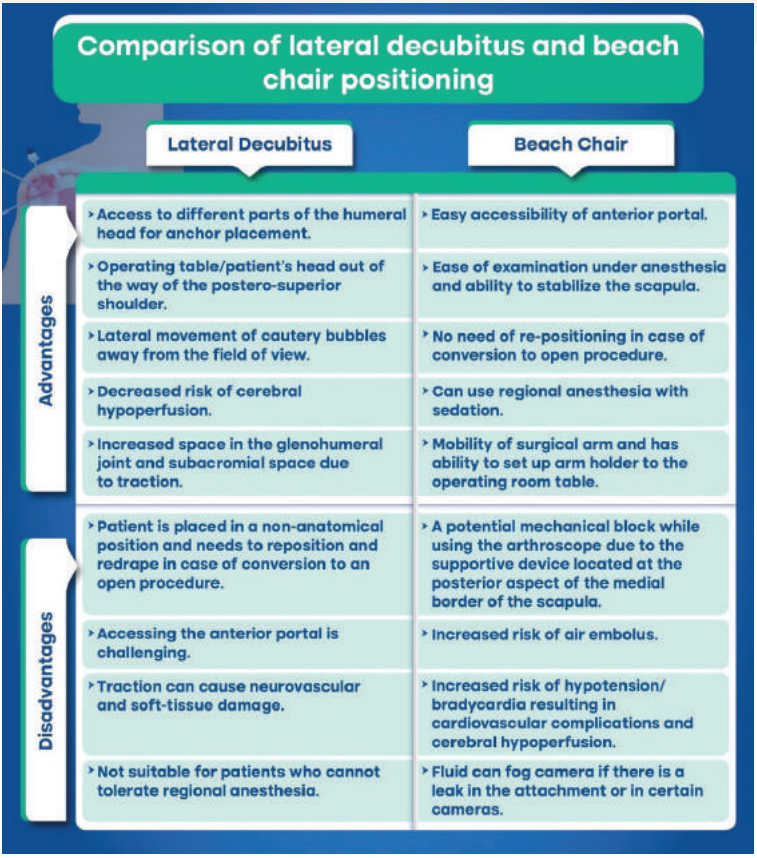

Table 1: Comparison of lateral decubitus and beach chair positioning methods for rotator cuff repair (2)

2. Control of Bleeding

- Arthroscopic operation requires adequate visualization to be effective, and control of bleeding is a fundamental component of this (2). This can be achieved through modifying certain factors like (2):
  - Patient factors such as blood pressure control
  - Pump factors such as pump pressure and rate of fluid flow
  - Fluid factors like the use of epinephrine
  - Turbulence
- Turbulence can be eliminated through the application of pressure over leaking portals at the surgery site (2).
- Administration of tranexamic acid intravenously 10 minutes before surgery improves visual clarity and reduces postoperative analgesic consumption (2).

3. Considerations for Easy Access to Tear

- The "angle of visualization" is generally determined by the position of the portal used for viewing and the angle of the arthroscope (2)
- The viewing portals and the angle of the arthroscope can be modified to maximize visualization to approach and treat the tear (2).
- The internal deltoid fascia can limit movement in the subacromial space, and a tiny part of it may be removed to increase mobility (2).
- The use of a cannula will help pass sutures and tie knots to avoid the creation of a tissue bridge between sutures (2).
- Approach to angle and portal placement can be assisted with an outside-in technique with an 18-gauge spinal needle, which may allow the joint to be entered precisely as planned (2).

4. Optimization of Biomechanical Considerations

For having an ideal rotator cuff repair construct, it is important to consider biomechanical factors such as suture-to-bone fixation, suture-to-tendon fixation, abrasion resistance of the suture, suture strength, knot security, and loop security (2). Factors that influence this are given in Table 2.

Biomechanical factors for rotator cuff repair

Considerations for Repair Techniques	Description
Single row, double row, and trans-osseous	• The double row is preferred due to its ability to link both medial and lateral rows and it also offers high healing than single-row repair.
Optimizing the suture-tendon interface	• Double or triple-loaded anchors are generally used for the optimization in rotator cuff repair. They optimize the surgery by reducing the load by 50%.
Anchor insertion	• Anchor insertion at a mechanically favorable angle optimizes pull-out strength. • This angle describes both the angle at which the anchor is inserted and the angle that the suture makes with the rotator cuff.
Choice of a suture anchor	• The vented or coil-type open-architecture suture anchors have a potential to induce bony ingrowth into the bone tunnel, and release biologically active marrow constituents.
Choice of material	• Anchors manufactured entirely from suture material offer distinct advantages such as smaller predrilled hole-preserving bone, and less disruption to the articular cartilage.
Type of suture	• Tape sutures are generally preferred in knotless constructs while standard wire sutures are for a 'knotted' repair because they are pre-loaded within the suture anchors.
Arthroscopic knots	• The choice of knots is based on the knot and loop security. • Knot security refers to the resistance to slippage when the load is applied and depends upon friction. • Loop security maintains a tight suture loop around tissue when the knot is tied.
Subscapularis repair	• Visualization of the subscapularis tear can be improved by placing the arm in traction, forward flexion, and internal rotation and also by a posteriorly directed force on the upper arm (posterior lever push).

Table 2: Biomechanical factors for rotator cuff repair (2,4)

5. Postero-Superior Tear Patterns and Repair Techniques for the Treatment of Rotator Cuff Tear

- Postero-superior tears are generally classified according to the mobility of their free margins and shape (2).
- Crescent-shaped tears-
  - These tears exhibit medial-to-lateral mobility and can be repaired directly to the bone with minimal tension (2).
- U-shaped tears-
  - U-shaped tears offer good medial retraction (2). Side-to-side sutures are placed in a medial-to-lateral direction between the anterior and posterior margins of the tear which results in a T-shaped repair (2).
- L-shaped tears-
  - L-shaped tears have good mobility in one of the free margins (i.e., either anterior or posterior) which allows it to be reduced more easily to the bone (2).
- Massive, contracted, immobile tears-
  - Massive, contracted, immobile tears have little to no mobility in both the anterior-posterior and medial-lateral directions that makes marginal convergence and direct tendon-to-bone repair impossible (2).

CONCLUSION

The arthroscopic rotator cuff repair technique is a challenging procedure to execute but it has evolved inadvertently over the past few years (2). Surgeons must understand the importance of biomechanical factors and the techniques that leads to anatomical tendon-bone healing (2). Understanding the appropriate fixation strategy along with adequate visualization can result in successful outcomes with a high level of patient satisfaction (2).

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Bradyarrhythmias

Rare case of intraoperative life-threatening Bradyarrhythmias in an otherwise healthy patient due to a Bronchogenic Cyst treated effectively at Aster Cedars Hospital, Jebel Ali

PRESENTATION

- 58 year old male
- No medical history
- No family history of medical illness
- Admitted with:
  - Bilateral ear block and reduced hearing for 5-6 months
  - Large central perforation in both tympanic membrane
  - PTA: Right - 47 db, Left - 38 db

FINDINGS

During Examination:

- No comorbidities
- Stable vitals
- Systemic Examination: Nil significant
- Airway Examination: Normal
- RCRI: 0-5% (Age Related)
- Lab Investigations: Within Normal Limits

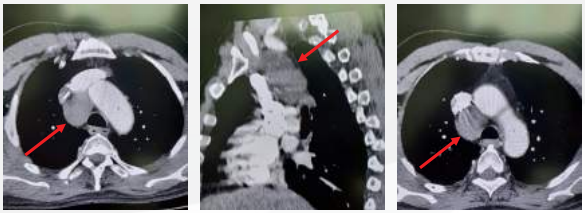
DIAGNOSIS: BRADYARRHYTHMIAS DUE TO BRONCHOGENIC CYST

Possible causes:

Ischaemic Cardiac Etiology, Pulmonary Thromboembolism, Electrolytes Abnormalities and Thyroid Disease were considered, which were ruled out after investigations in the intra and post-operative period.

After stabilization, CT Pulmonary Angiography was done, that revealed well defined non-enhancing, thin-walled hypodense large cystic lesion of approximately 32 x 31 x 52 mm size involving middle mediastinum along the right pre-paratracheal region, posterior to superior vena cava and arch of the aorta and right anterolateral to joining of an azygous vein with superior vena cava just above the tracheal bifurcation. No infiltration of mediastinal structures or lung parenchyma.

The patient was discharged from the hospital after stabilization and was asked to follow up in the OPD for further evaluation.



CT images of the Cyst

DURING PROCEDURE

The patient was planned for Right Tympanoplasty and Mastoidectomy under general anaesthesia:

- After following the pre-operative protocols, patient was taken up for the surgery and general anaesthesia was induced and maintained using IV and Inhalational Anaesthetics.
- Surgery started after proper cleaning and draping.
- Patient continued to be stable on IV and Inhalational Anesthesia.
- After about 1 hour of induction of anaesthesia, patient started having Bradyarrhythmias (Atrial Bigeminy) with profound hypotension.
- HR: 93/min with Pulsus bigeminus
  PR: 46/min
  BP: 68/43 mm Hg
- Inj. Xylocard 60 mg IV Stat given for arrythmias, and Inj. Ephedrine and Inj. Phenylephrine were used to correct hypotension.
- Rhythm was reverted back to sinus after inj. Xylocard, but patient continued to be in hypotension.
- Inj. Noradrenaline started at 0.1 mcg/kg/min that stabilized the BP to 103/68 mm Hg.
- Patient had similar episode after 12-14 min responding to Inj. Xylocard 40 mg iv Stat followed by Inj. Atropine 0.5 mg iv Stat.
- Cardiologist was informed and defibrillator was attached to the patient. Blood samples were taken for VBG, Troponin I, serum electrolytes and blood sugars.
- Troponin came as elevated with 36.800 pg/ml while the other investigations were within normal limits.
- Surgery continued and patient was shifted to ICU on ventilator with sedation and paralysis after surgery.
- ECG post operative: Sinus Tachycardia; 2D ECHO: WNL.
- Troponin value increased up to 409 pg/ml in post-op and then started declining.
- Patient was continuously under observation in ICU and extubated in the evening after discussion with Cardiologist and ENT surgeon.
- All lab investigations done during this period were within normal limits.
- Patient continued to be stable in ICU after extubation, fully conscious and coherent.

POST PROCEDURE

The patient tolerated the procedure well. He was stable in condition at the time of discharge.

DISCUSSION

Unexplained hypotension and arrhythmias during the surgery suggest a likely Cardiac Event with Ischaemic Etiology. The possibility of this Cardiac event in an otherwise healthy individual without any comorbid factors is extremely rare (<0.5%). In this case, the likely cause of this event was a bronchogenic cyst incidentally detected on a CT pulmonary angiogram that was done to evaluate events.

Asymptomatic Bronchogenic cysts causing major significant Cardiac event with life-threatening consequences is a rare occurrence. As this cyst was located close to vital structures, it can lead to compression of the right and left atrium explaining the above arrhythmias.

The patient was sent for further evaluation of the cyst and surgical removal if required, as it can pose a danger to his life in the unfortunate event of any major emergency surgery for the patient.

Diagnosing these cases on routine preoperative evaluation is easier if a strong clinical suspicion is present in history or examination findings. In addition, these cases pose the risk of unexplained intra-operative morbidity and mortality, which can be challenging for the personnel involved.

Explaining to patients and bystanders about such incidental findings is another Herculean task. Nevertheless, suggestions and corrective measures are always welcomed to avoid such consequences in future.

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Aster GUARDIANS
Global Nursing Award

Congratulations to Nurse **Margaret Helen Shepherd from UK** - Winner of Aster Guardians Global Nursing Award 2023

The **Top Ten Finalists** with our Visionary Leaders

The **Aster Leadership** at the Awards

Congenital Heart Diseases and Treatment

Current Approaches in the Management of Congenital Heart Diseases

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INTRODUCTION

Congenital heart disease (CHD) is the most common birth defect and the leading cause of death in children (1). It affects nearly 1% of all live births worldwide (1). CHD encompasses a wide spectrum of defects from simple malformations with a favorable prognosis to more complex and severe lesions that require multiple catheter-based or surgical interventions (1). The etiology of CHD is multifactorial as both genetic and environmental factors have been implicated (1). Early fetal diagnosis of a treatable CHD has been shown to reduce the risk of perinatal morbidity and mortality (2).

In this article, we highlight the types of congenital heart disease and the various approaches to its treatment.

TYPES OF CONGENITAL HEART DISEASE AND ITS TREATMENT

CHD represents a complex spectrum of diseases, which have a variable impact on the lives of patients (3). The treatment of CHD depends on the specific type and severity of the defect (2). In some cases, no treatment is necessary and the defect may close on its own (2). In other cases, surgery or other interventions may be necessary to repair or correct the defect (2). As CHDs are time-sensitive and progressive for patients, they often require life-prolonging or life-saving treatments (3).

Type	Congenital Heart Disease	Summary
Septal defects	Atrial Septal Defect	Developmental failure to close the opening in the heart between the upper chambers (right and left atria) (4).
	Ventricular septal Defect	Developmental failure to close the opening in the heart between the lower chambers (right and left ventricles) (5).
	Atrioventricular septal defect	An opening to a variable degree in the heart between both the upper and the lower chambers (atria and ventricles) (6).

Figure 1: Summary of the different septal defects in congenital heart diseases.

TREATMENT APPROACHES FOR SEPTAL DEFECTS

Atrial Septal Defect (ASD)

Defects larger than 1 cm will most likely require medical/surgical intervention (4). If an ASD requires closure, percutaneous transcatheter and surgical interventions can be used (4). When ASD are closed percutaneously, patients require antiplatelet therapy for the subsequent 6 months (4). On the other hand, surgical closure involves placing a patch over the lesion through an incision in the right atrium (4).

Ventricular Septal Defect (VSD)

For larger defects, surgical VSD closure and device closure are the primary interventions (5). Percutaneous device VSD closure is reserved for individuals who are at high risk for surgery due to severe pulmonary arterial hypertension (PAH) with reactive pulmonary vascular resistance, multiple comorbidities, and those who have had prior cardiothoracic surgery such as residual or recurrent VSD (5).

Atrioventricular Septal Defect (AVSD)

Diuretics and vasodilators reduce the preload and afterload to relieve the symptoms associated with pulmonary congestion and heart failure (6). Surgical correction is the ultimate treatment of AVSD (6). For partial AVSD, the primary repair is preferred with patch closure and atrioventricular valve repair as indicated (6). For balanced complete AVSD, early primary repair with two patch closure techniques is preferred over one patch closure (6).

Type	Congenital Heart Disease	Summary
Right heart malformations	Pulmonary valve stenosis	Defect of the pulmonic valve in which the valve is stiffened, obstructing blood flow (7).
	Patent ductus arteriosus	Lack of closure of the ductus arteriosus post-birth causing blood to skip circulation to the lungs (8).
	Pulmonary atresia with intact ventricular septum	Characterised by an immobile and thickened pulmonary valve and the presence of a reversed flow in the pulmonary artery from the ductus arteriosus to the pulmonary valve (2).
	Ebstein Anomaly	Characterized by the lack of mobility and downward displacement of septal and posterior cusps of the Tricuspid Valve (TV) (gap between the TV and the mitral valve >8 mm) (9).

Figure 2: Summary of the different right heart malformations in congenital heart diseases.

TREATMENT APPROACHES FOR RIGHT HEART MALFORMATIONS

Pulmonary valve stenosis

Surgical intervention is recommended for severe valvular stenosis involving severe pulmonary regurgitation, hypoplastic pulmonary annulus, subvalvular stenosis, or supravalvular stenosis (7). Balloon valvotomy can be performed, if peak doppler gradient is >60 mm Hg in asymptomatic patients, or if peak doppler gradient is >50 mm Hg in symptomatic patients (7). For supravalvular and subvalvular pulmonic stenosis, pulmonary artery balloon angioplasty, is an acceptable treatment (7).

Patent ductus arteriosus

Initially, fluid restriction, diuretic therapy and respiratory support are recommended for newborns with this condition having heart failure (8). If no improvement is detected, pharmacologic therapy with indomethacin or ibuprofen should be started for for premature newborns who may respond by constriction and closure of the patent ductus (8). Surgical (conventional or bedside), video-assisted thoracoscopic surgical (VATS) or trans-catheter closure is required if two courses of pharmacologic therapy fail (8).

Pulmonary atresia with intact ventricular septum

Prostaglandin E2 should be considered to keep it open until surgical correction can take place (2). Diuretics or digoxin is indicated if the patient is going into congestive heart failure (2). The type of surgical management will depend on the type of the anatomy (2).

Ebstein Anomaly

In cases of extreme cyanosis, prostaglandin E1 infusion can be used (9). Children with atrial arrhythmias can be managed with rate control medications like beta-blockers (9). Infective endocarditis antibiotic prophylaxis is recommended for patients with Ebstein anomaly and cyanosis and following surgical repair with prosthetic cardiac valves (9).

Type	Congenital Heart Disease	Summary
Left heart anomalies	Aortic valve stenosis	A type of valvular heart disease in which the valve between the lower left heart chamber (left ventricle) and the aorta is narrowed and doesn't open fully (10).
	Hypoplastic left heart syndrome (HLHS)	A set of congenital and pathogenically closely related malformations involving atresia or critical stenosis of either the mitral or aortic valve with sequential left ventricle. This leads to severe underdevelopment of the left heart structures (11).

Figure 3: Summary of the different left heart anomalies in congenital heart diseases.

TREATMENT APPROACHES FOR LEFT HEART ANOMALIES

Aortic valve stenosis

The first therapeutic procedure for aortic valve obstruction is balloon valvuloplasty, which is successful in most cases, with surgery reserved for failed or complicated cases (10). Transcatheter aortic valve replacement (TAVR) has revolutionized the management of calcific aortic stenosis and has proven to be superior to medical therapy in patients who are not candidates for surgery (10).

Hypoplastic left heart syndrome (HLHS)

All newborns with HLHS prostaglandin infusion should be initiated (2). In general, the surgical management of HLHS requires three palliative surgical procedures: Norwood (or Norwood-Sano) operation or a hybrid approach within the first week after delivery, followed by a Glenn procedure at approximately six months and a Fontan procedure at two to three years (2).

Type	Congenital Heart Disease	Summary
Conotruncal anomalies	Tetralogy of Fallot	A congenital anomaly resulting in pulmonary stenosis, an interventricular defect, biventricular aortic origin, and right ventricular hypertrophy (12).
	Transposition of the great arteries	Cardiac defect arising from an embryological discordance between the aorta and pulmonary trunk. Consequently, the aorta arises from the right ventricle and the pulmonary trunk arises from the left ventricle thus creating two parallel circuits incompatible with life (13).
	Double outlet right ventricle	A type of ventriculoarterial connection in which both the pulmonary artery and Aorta arise either entirely or predominantly from the right ventricle (14).
	Truncus arteriosus	A rare, congenital, cyanotic heart defect characterized by a ventricular septal defect (VSD), a single truncal valve, and a common ventricular outflow tract (OT). Systemic venous blood and pulmonary venous blood mix at the VSD level, and the resulting desaturated blood is ejected into the single OT (15).

Figure 4: Summary of the conotruncal anomalies in congenital heart diseases.

TREATMENT APPROACHES FOR CONOTRUNCAL ANOMALIES

Tetralogy of Fallot

Neonates with severe right ventricle outflow obstruction may require prostaglandin therapy before surgical repair (12). Morphine and intravenous beta-blockers also improve the right ventricle outflow obstruction (12). In cases of heart failure, digoxin and loop diuretics can be good pharmacological therapeutic options (12). The Blalock-Taussig shunt or systemic to pulmonary arterial shunt is an acceptable palliative therapeutic option for cyanotic defects with decreased pulmonary blood flow (12). The transannular patching and ventriculotomy are another therapeutic option for pulmonary insufficiency and right ventricle dysfunction (12).

Transposition of the great arteries

After birth, patient with D-TGA should receive prostaglandin infusion to maintain the ductus patency and may require balloon atrial atrioseptostomy (2). Arterial switch operation (ASO) and Rastelli procedure are the two commonly used surgical procedures for D-TGA with VSD and pulmonarystenosis (13). Patients with L-TGA may not require any intervention (2).

Double outlet right ventricle

Various surgical options are available for Double outlet right ventricle depending on the location of Ventricular septal defect, pulmonary valve status and pulmonary artery pressure. These could include pulmonary banding or shunt initially or biventricular repair (14).

Truncus arteriosus

Loop and thiazide diuretics help to achieve proper fluid balance (15). If there is a concurrent aortic arch anomaly it promotes ductal patency with prostaglandin infusion (15). Commonly, patients with truncus arteriosus undergo surgical repair within the first few weeks after delivery, with VSD closure and usually a placement of a pulmonary conduit into the right ventricular outflow tract (RVOT) (2).

Type	Congenital Heart Disease	Summary
Aortic arch anomalies	Coarctation of the aorta	Coarctation of the aorta is a narrowing of the aorta, most commonly occurring just beyond the left subclavian artery. However, it can occur in various other locations of the aortic arch (proximal transverse) or even in the thoracic or abdominal aorta. The narrowing of the aorta raises the upper body blood pressure, causing upper extremity hypertension. Unrepaired coarctation leads to premature coronary artery disease, ventricular dysfunction, aortic aneurysm/dissection, and cerebral vascular disease by the third or fourth decade of life (16).

Figure 5: Summary of the aortic arch anomalies in congenital heart diseases.

TREATMENT APPROACHES FOR AORTIC ARCH ANOMALIES

Coarctation of the aorta

Prostaglandin E1 infusion occasionally can relax the tissue of the coarctation segment (16). The treatment for coarctation of the aorta is to eliminate the narrowed segment (16). This can be accomplished surgically or via transcatheter techniques (16). Surgery requires the removal of the coarctation segment and direct anastomosis of the normal aorta (16). The transcatheter technique utilizes balloon and stent angioplasty (16).

Type	Congenital Heart Disease	Summary
Complex congenital heart disease	Single Ventricle defect	The univentricular heart or "single ventricle" is a condition in which both atria are connected to a dominant ventricle. This ventricle maintains the systemic and pulmonary circulations (2).

Figure 6: Summary of the univentricular heart.

TREATMENT APPROACHES FOR CONGENITAL HEART DISEASES

Single Ventricle defect

After birth, the hemodynamics of the univentricular heart depends on other associated anomalies (2). Depending on the outflow tracts the newborns are submitted to palliative surgery with pulmonary banding or systemic-pulmonary shunt (Blalock-Taussig operation) (2). A surgical cava-anastomose between superior vena cava (SVC) and pulmonary artery (Glenn operation) is performed at about six months of age and it is completed by directing the flow of the inferior vena cava to the pulmonary artery (Fontan operation), generally between two and four years of age (2).

Key Highlights

- CHD represents a complex spectrum of diseases and is a leading cause of death in children (3). It has a significant impact on their lives (3).
- CHD encompasses a wide spectrum of defects from simple malformations with a favourable prognosis to more complex and severe lesions that require multiple catheter-based or surgical interventions (1).
- Early foetal diagnosis of a treatable CHD has been shown to reduce the risk of perinatal morbidity and mortality (2).

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Replantation of Metacarpophalangeal (MCP) Amputation

Successful Replantation of Complete Post-Traumatic Metacarpophalangeal (MCP) Amputation of Left Thumb using Venous Graft at Aster Hospital, Al Qusais

Dr Rajkumar Ramachandran
Plastic Surgery (Specialist)

PRESENTATION

- 47 year old male
- No medical history
- Admitted with:
  - History of accidental traumatic amputation of left thumb with some cutting machine at work

FINDINGS

During Examination:

- Patient was found conscious and oriented with stable vitals
- Left hand – complete amputation of left thumb at MCP joint level. Amputated part preserved in ice and brought to ER. Arterial sputter at the amputated Stump was present
- Right thumb – nail bed injury

Amputated – Left thumb – Volar view

Amputated – Left thumb – Stump

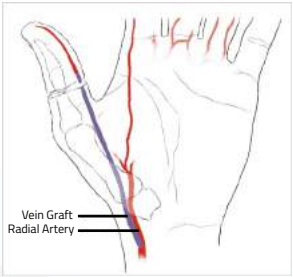
Amputated – Left thumb – Dorsal view

PROCEDURE

- Surgery proceeded with identifying the vital structures in the amputated specimen; the dominant ulnar digital artery of the thumb was found to be avulsed, and the intima was damaged. Certain segments were missing and found to be not suitable for anastomosis.
- Radial digital artery was identified and tagged. Radial and ulnar digital nerves were identified and tagged. 2 dorsal veins were dissected and tagged under the operating microscope.
- PPX bone was comminuted.
- Patient shifted, and general anaesthesia was given. The amputated part was fixed to the stump with the help of a K-wire under C-arm guidance.
- Extensor and FPL tendon repaired with 3-0 ethibond 4 strand repair.
- Avulsed and damaged ulnar digital artery replaced with vein graft from Great Saphenous Vein (GSV).
- The radial artery at the wrist was anastomosed to the dominant ulnar digital artery by the end-to-side fashion with 10-0 ethilon.
- Severed radial digital artery, proximal and distal ends repaired end-to-end with 10-0 ethilon.
- Radial and ulnar digital nerve proximal and distal ends repaired at the end-to-end fashion, respectively, with 8-0 ethilon.
- Finally, after venous filling, two prominent veins were selected dorsally, and venous anastomosis was done end-to-end with corresponding proximal and distal segments.
- Skin closed with 4-0 Vicryl Rapide.

SEQUENCE OF REPLANTATION

Structures Repaired	Thumb
1.Bone	K-Wire Fixation
2.Digital Artery	Using Venous Graft
3.Flexor Tendon	Direct
4.Extensor Tendon	Direct
5.Digital Nerve (Both Radial and Ulnar Side)	End to End Repair
6.Digital Vein	End to End Repair



Diagrammatic Representation of Venous Graft

POST PROCEDURE

A pulse oximeter was fixed to the amputated thumb, and SPo2 was monitored and maintained at 99%. Inj. Clexane was administered once daily subcutaneously for 5 days. The patient recovered well postoperatively. The patient was in stable condition on discharge. K-wire was removed after 5 weeks, and physiotherapy was initiated.

POST-OPERATIVE IMAGES

Dorsal View

Palmer View

DISCUSSION

Indications and Contraindications for Replantation:

Indications

- The thumb
- All amputations in children
- Multiple digits
- The palm, wrist, and distal forearm levels

Contraindications

- Concomitant life-threatening injury
- Multiple segmental injuries in the amputated part
- Extremely severe crush or avulsion
- Extreme contamination, as in some farm injuries
- Prior surgery or injury to the extremity that precludes replantation
- Precluding systemic illness
- Extremely prolonged warm ischemia
- Psychical problem

Replantation surgeries are time-bound procedures, and the ideal time for reestablishing arterial blood supply is 6 to 12 hours of cold ischemia. However, following this, the success rate comes down drastically. In this patient, the cold ischemia was around 6 hours. Hence, Arterial Anastomosis was given priority following the bone fixation.

Amputation injuries are rarely clean-cut injuries. Usually, they are associated with an avulsion component; in such cases, the vessel walls are stretched, and the intima gets damaged. These can be identified by "red line" and "ribbon" signs [1]. In such cases, doing a primary end-to-end anastomosis involving a damaged intima will ultimately result in thrombosis and anastomosis failure. Hence, segmental replacement of the damaged portion of the vessel with a vein graft is preferred.

The significant complications of replantation include venous or arterial thrombosis and anastomotic leak/rupture infection. Delayed complications include osteomyelitis, stiffness, tendon adhesion, neuroma, and cold intolerance. However, sensory recovery in thumb replantation is good, where 2-point discrimination is 11mm following full recovery. Therefore, despite several complications, replantation of the thumb is the preferred treatment choice. Since it carries out 40% of the hand functions, secondary reconstructive options like Toe to Thumb transfer and 3-staged osteoplastic reconstruction, stump lengthening, and prosthesis can be tried if replantation fails.

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