



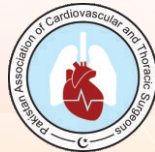
PACVTS

**13th Biennial Conference of
Pakistan Association of Cardiovascular
& Thoracic Surgeons**

05th - 07th Dec, 2025, PC Karachi



Abstract Book



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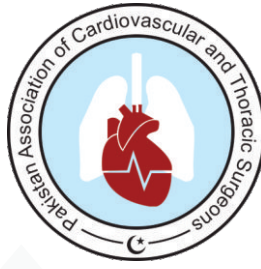


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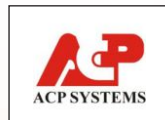
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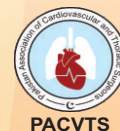
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Patron-in-Chief

Dear Colleagues,

It is my pleasure to welcome you to the 13th Biennial PACVTS Conference 2025, proudly hosted by NICVD, Karachi. This year's programme is designed to inspire and empower, featuring Master Classes, State-of-the-Art Lectures, Plenary Sessions, and special scientific sessions for young surgeons.

These sessions provide a unique opportunity for emerging surgeons to learn from national and international experts, gain hands-on experience, and engage in interactive discussions that shape the future of cardiovascular and thoracic surgery.

Join us from December 5-7, 2025, at Pearl Continental Hotel, Karachi, for a transformative experience of learning, innovation, and collaboration.



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M Asad Bilal Awan

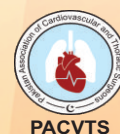
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Step into the future of cardiovascular and thoracic care at the 13th Biennial Conference of the Pakistan Association of Cardiovascular & Thoracic Surgeons (PACVTS), a landmark gathering where surgical excellence, scientific advancement, and global collaboration come together.

This flagship event sets the foundation for transformative dialogue and cutting-edge learning, proudly hosted by the National Institute of Cardiovascular Diseases (NICVD) at the Pearl Continental Hotel, Karachi, from December 5-7, 2025.

This year, the scientific programme is further enriched with exclusive Master Classes, offering immersive, high-impact learning led by distinguished national and international faculty. These specialized sessions provide hands-on insights, advanced surgical techniques, and practical expertise tailored for both emerging and experienced cardiovascular and thoracic surgeons.

Join us in Karachi for an exceptional experience where global vision meets national expertise—and where the future of cardiovascular and thoracic surgery is shaped through intelligence, innovation, and collaboration.



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Azra Fazal Pechuho

Minister of Health and Population
Welfare for the Govt of Sindh

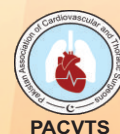
It is a great pleasure to extend my warmest welcome to all distinguished delegates, faculty members, and participants attending the 13th Biennial PACVTS Conference in Karachi. This important scientific gathering continues to serve as a vital platform for advancing cardiovascular and thoracic surgery in Pakistan.

The conference brings together leading national and international experts to share knowledge, innovative practices, and emerging trends that are shaping the future of our specialty. I commend the organizers for curating a programme that reflects both professional excellence and a forward-looking approach to improving patient care.

I am confident that the discussions, workshops, and collaborative exchanges over the next few days will contribute meaningfully to strengthening our healthcare system and inspiring continued progress in the field.

I congratulate PACVTS and all partners involved in organizing this event, and I wish the participants a rewarding and insightful conference.

Welcome to the 13th PACVTS Karachi Conference.



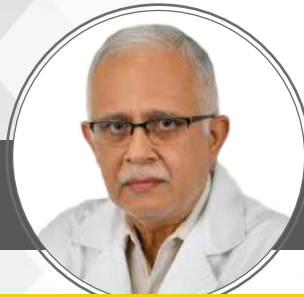
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Hasanat Sharif
President PACVTS

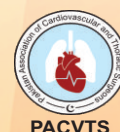
It is my pleasure to warmly welcome all delegates, faculty, and participants to the 13th Biennial PACVTS Conference in Karachi.

This meeting reflects our Association's continued commitment to advancing cardiovascular and thoracic surgery through learning, collaboration, and innovation.

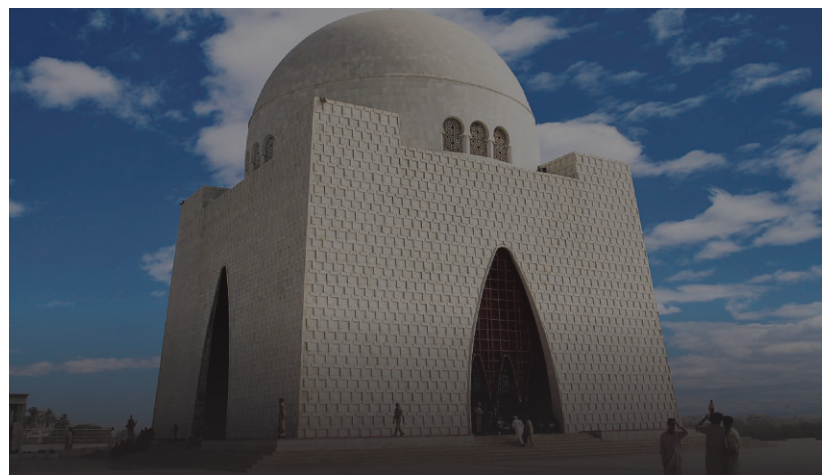
We are grateful to our national and international faculty for contributing to a strong scientific programme, and I appreciate the dedicated efforts of the organizing committee in bringing this conference to life.

I hope the sessions, discussions, and interactions over the coming days provide valuable insights and strengthen our shared mission of improving patient care across Pakistan.

Welcome to the 13th PACVTS Conference, and I wish you all a productive and enriching experience.



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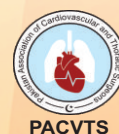


Karachi - The City of Lights

Karachi, the vibrant capital of Sindh, stands as Pakistan's largest metropolis and one of the world's most dynamic urban centers. With a population exceeding 20 million, this coastal city along the Arabian Sea has long served as the nation's gateway for trade, culture, and economic activity.

Once the capital of Pakistan (1947–1959), Karachi today is recognized as a beta-global city, driving the country's industrial and financial landscape with an estimated GDP of over \$200 billion.

Renowned for its unmatched energy and diversity, Karachi is celebrated as Pakistan's most cosmopolitan city, home to a rich blend of linguistic, ethnic, and religious communities. Its progressive spirit, cultural vibrancy, and ever-glowing skyline truly embody its title: The City of Lights.



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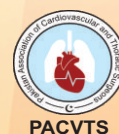
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Is the Radial Artery better than the Saphenous Vein Graft in Coronary Artery Bypass Grafting? A propensity score-matched follow up study

Tayyab Pasha, Shahid Sethi, Moazzam Sheikh

Abstract

Introduction: Coronary artery bypass grafting (CABG) remains a cornerstone in the treatment of coronary artery disease. The choice of conduit for grafting is a critical decision with potential long-term implications. This retrospective study aimed to compare the long term outcomes between saphenous vein grafts (SVG) and radial artery grafts (RAG) in CABG procedures using propensity score matching and survival analysis

Methods: This study examines the outcomes of 1059 patients who underwent Coronary Artery Bypass Graft (CABG) procedures between 2010 and 2023 at Jinnah Hospital Lahore/ AIMC. A total of 705 patients were successfully contacted, allowing for a comprehensive analysis. The study focuses on the type of grafts used, specifically radial artery grafts (n=221) and saphenous vein grafts (n=484). Additionally, the paper explores the mortality rates within these subgroups, with 34 expired cases (15.4%) in the radial artery graft group and 93 (19.2%) in the saphenous vein graft group during the long term follow up. A Propensity score matched analysis was performed in STATA software to examine treatment effect (mortality). We used the Kaplan-Meier function and Cox Proportional Hazard model for survival analysis.

Results: 221 patients received radial artery grafts, while saphenous vein grafts were utilized in 484 cases: In an unmatched analysis, 34 patients that received the radial artery grafts faced mortality (15.4%) whereas 93 individuals with a saphenous vein graft expired (19.2%)

A propensity matched cohort of saphenous vein graft patients yielded a 16.23 percent mortality rate (19 out of 117 patients expired) in a follow up period of 6.86 years. Similar analysis in the cohort receiving radial arteries revealed a 14.8 percent mortality rate (14 deaths out of 94 patients) over a period of 7.9 years.

Beating Heart Surgery: A Fast Track to Recovery in Management of Cardiac Diseases.

Saeed Afridi

Abstract

Background: The use of the off-pump technique for performing coronary artery bypass grafting (CABG) has decreased over time. Off-pump coronary artery bypass surgery eliminates the need for a cardiopulmonary bypass machine, thereby avoiding its associated complications. However, randomized control trials have either shown benefits for on-pump CABG or yielded similar results. Questions have been raised regarding the conduct of these studies.

Objectives: This study aims to discuss the early outcomes of a large cohort of patients who underwent OPCAB in a real-world practice.

Methods: A total of 3041 consecutive patients scheduled for OPCAB were included in the study conducted at Hameed Latif Hospital, Lahore, Pakistan from 2020 to 2025. Data regarding demographic, clinical, intra-operative, and post-operative outcomes were collected and analyzed. Appropriate tests were used for statistical comparisons, with significance set at $p < 0.05$.

Results: The mean age of the patients was 52.70 ± 9.70 years, with a minimum age of 22 years and a maximum age of 89 years. In this study, there were 2512 (82.6%) male patients and 529 (17.4%) female patients. The mean pre-operative ejection fraction (EF) was 48.38 ± 11.04 , with a minimum EF of 20% and a maximum of 70%. The mean post-operative EF was 48.44 ± 11.03 . This study included 1526 (50.2%) hypertensive patients, 1915 (63%) diabetic patients, 1213 (39.9%) smokers, 1562 (51.4%) obese patients, 2652 (87.2%) patients with hyperlipidemia, 1410 (46.4%) patients with a family history of coronary artery disease (CAD), 266 (8.7%) patients with chronic obstructive pulmonary disease (COPD), 11 (0.4%) patients with a prior stroke, and 15 (0.5%) patients who were pre-operatively on dialysis. The mean of syntax score was

31.65 ± 2.25. The Mean EURO score II was 2.03 ±1.5. Mild inotropic support was required in 1020 (33.5%) patients, moderate support in 827 (27.2%) patients, and no support was needed in 1132 (37.2%) patients, while 62(2%) required high support.

The 30-day postoperative all-cause mortality rate was 23 (0.8%). An intra-aortic balloon pump was required in 5 (0.2%) patients, while 3 (0.1%) developed a CVA, 5 (0.2%) suffered from an MI, and 29 (0.9%) were re-explored for bleeding. A transfusion of packed red cells was necessary for 412 (13.5%) patients, and 136 (4.5%) received FFPs. Deep Wound infection was observed in 0.9%. Graft distribution was as follows: single (5.5%), double (38.6%), triple (43.1%), quadruple (12.4%), and quintuple (0.4%). Over 95% of the patients discharged from hospital on 3rd post-operative day.

Conclusion: In this large single-center cohort, OPCAB was associated with low early mortality, acceptable complication rates, and positive short-term outcomes, even among patients with moderate to high coronary complexity. These findings reinforce the safety, efficacy, and clinical utility of beating-heart revascularization in modern cardiac surgery practice.

Artery only bypass, Total Arterial Revascularization in a Resource-Limited Setting: Experience from SICVD Sukkur

Vikram Kumar

Abstract

Background: Total arterial revascularization (TAR) in coronary artery bypass grafting (CABG) is associated with superior long-term outcomes compared with venous conduits. Despite this, its adoption worldwide particularly in low- and middle-income countries remains limited, largely due to technical challenges and resource constraints. This study presents the early institutional experience with TAR at a regional cardiac surgery center in Sukkur, Pakistan.

Methods: Between June 2024 and December 2024, a total of 25 patients underwent isolated CABG using exclusively arterial conduits at the Sindh Institute of Cardiovascular Diseases (SICVD) Sukkur. All procedures were performed on-pump, utilizing bilateral internal mammary arteries (BIMA) and radial artery grafts in every case. Demographic characteristics, perioperative outcomes, and early follow-up results were analyzed.

Results: Patients were relatively young, aged 25–50 years, with advanced multivessel coronary artery disease. All procedures were completed successfully with no operative mortality. No major complications occurred, including sternal wound dehiscence, re-exploration for bleeding, stroke, or readmission. Minor superficial surgical site infections were observed in 4 patients and managed conservatively. Postoperative CT angiography was performed in 03 patients, demonstrating 100% patency of all grafts. At early follow-up, all patients remained alive and free of ischemic symptoms.

Conclusion: This early experience confirms that Total Arterial Revascularization using BIMA and radial artery conduits is safe, feasible, and effective mode of treatment specially in younger population. Though technique is very early and newborn but results demonstrate that TAR is reproducible and trainable modality and need of time. TAR may represent the preferred revascularization strategy, offer durable outcomes and align surgical practices in Pakistan.

How To Set Up A Minimally Invasive Mitral Valve Surgery: A Practical Guide

Masooma Asghar Ali Juma; Salman Pervaiz Butt; Umer Darr

Abstract

Background: Minimally invasive mitral valve surgery (MIMVS) offers reduced postoperative pain, shorter hospital stays, faster recovery, early mobilization, and superior cosmetic outcomes over conventional sternotomy. This guide outlines a standardized, cost-effective setup for mitral repair/replacement with high adaptability across diverse clinical settings.

Methods: From 2022 to 2025, the setup of MIMVS has been successfully implemented in over 50 cases at Cleveland Clinic Abu Dhabi (CCAD) involving myxomatous mitral valve degeneration and rheumatic mitral valve disease. The surgical approach involves right mini-thoracotomy (5-6 cm) through the 3rd intercostal space at the anterior axillary line (offering a higher axillary entry), femoral cannulation for cardiopulmonary bypass, and the use of specialized long-shafted instruments. Key components of the setup include patient selection, patient positioning, perfusion strategy and equipment arrangement to facilitate ergonomic access, efficiency and shorten the operative duration.

Results: A total of 60 patients underwent MIMVS. The overall procedural success rate was 98.3%, with 0% intraoperative or 30-day mortality. The majority (85%) underwent valve repair, while the remainder required valve replacement. The average cardiopulmonary bypass time was 117 minutes, and cross-clamp time was 76 minutes. Average ICU stay was 1.5 days and total hospital stay 4.2 days. Most patients resumed normal activity within three weeks post-discharge.

Conclusion: Sharing CCAD's setup can help standardize MIMVS globally, promoting wider adoption in resource-limited centres without substantial financial burdens.

The First 100 Open Heart Surgeries: A Young Consultant's Journey of Survival, Struggle, and Success in Private Practice at RMI and Kabul

Saifullah

Abstract

Background: Transitioning from structured fellowship and academic environments into independent surgical practice poses significant challenges for young cardiac surgeons. This is particularly magnified in resource-limited, private hospital setups where support systems are minimal.

Methods: This abstract summarizes the first 100 open heart surgeries performed independently by a young consultant cardiac surgeon. Initial 44 cases were conducted at Rehman Medical Institute (RMI), Peshawar (April 2023–August 2024), within a well-established academic environment with full backup. Subsequently, 56 cases were performed at Mellat Medical Complex, Kabul (August 2024 onwards), in a private hospital with limited resources, minimal backup, and no trained cardiac residents. Case distribution included CABG, valve surgeries, complex combined procedures, myxoma, ASD closure, and aortic root replacement.

Results: RMI cohort (n=44): 39 CABG, 1 AVR+CABG, 1 AVR, 2 MVR, 1 Bentall; no morbidity or mortality. - Kabul cohort (n=56): 46 CABG, 4 MVR+TV repair+LAA ligation, 1 AVR, 1 LA myxoma, 1 ASD, 1 Bentall+CABG. Initial 4 mortalities occurred in the first 6 months, attributed to lack of ICU expertise and inadequate trained staff. After establishing structured ICU training for nurses and medical officers, subsequent 6-month audit showed zero morbidity and mortality..

Conclusion: This experience highlights the dual journey of a young consultant: academic safety versus private practice reality. It demonstrates that with perseverance, adaptability, and system-building, successful outcomes can be achieved even in resource-limited environments. This journey not only reflects personal survival and struggle but also provides a roadmap for young surgeons entering independent practice—emphasizing the urgent need for institutional trust, adequate support, and opportunities for early responsibility.

Is every Ebstein repairable? The Early and Midterm Outcomes of Adult Cone Repair Series – the AFIC Experience

Dawood Kamal

Abstract

Background: This study aims to elucidate the early and midterm outcomes of Cone Repair for Ebstein Anomaly in Adult patients at our institution

Methods: Between January 2020 and December 2024, 15 adult patients underwent Surgical Correction for Ebstein Anomaly: 11 underwent the Standard Cone Repair, 03 underwent the Modified Cone Repair, and 01 underwent the Tricuspid Valve Replacement (TVR). The mean age was 26.08 (SD 9.53) years and mean weight was 61.67 (SD 19.32) kg, respectively. Cavo-Pulmonary (CP) shunt was added in 5 patients (33.3%). 02 patients had associated VSD Closure (13.3%).

Results: Patients septal leaflet displacement of > 40mm had increased incidence of having either a TVR, a Modified Cone Repair or addition of CP Shunt. There were no early deaths. Among the Cone Repaired (Standard & Modified); all patients had trivial/mild TR at discharge. At midterm median follow up of 3.2 years all patients are alive and continue to have same TV competence at follow-up, except 01 who has moderate TR. All patients are in NYHA I.

Conclusions: Both Standard and Modified Cone Repair has excellent early and midterm outcome in Adults with Ebstein Anomaly. Septal leaflet displacement of more than 40mm in adults is associated with need for TVR or Modified Cone repair or addition of CP Shunt. Modified Cone Repair is excellent strategy to avoid TVR in extreme septal leaflet displacement.

Beyond Sternotomy: Minimal Right Vertical Infra-axillary Access for Congenital Heart Defects

Atif Nawaz

Abstract

Background: We sought to investigate the feasibility and surgical outcomes of repairing a spectrum of congenital heart lesions through a right vertical infra-axillary approach (RVIAI) with particular focus on safety and cosmetic benefit.

Methods: A retrospective review was conducted on 10 patients who underwent atrial and ventricular septal defect closure through a minimal right vertical infra-axillary incision. Demographic data, intraoperative findings, and postoperative outcomes were collected from hospital records. Cosmetic appearance and early recovery were also evaluated during follow-up.

Results:

A total of 10 patients (5 male, 5 female) underwent minimal right vertical infra-axillary incision for atrial and ventricular septal defect closure. The mean age was 5 years (range, 2-27 years), with a mean weight of 16.3 kg (range, 9-25 kg) and mean height of 108.3 cm (range, 86-124 cm). All procedures were successfully completed through the minimal approach without conversion to sternotomy. No operative mortality or major complications were observed. Postoperative recovery was uneventful in all patients with early mobilization and discharge. Cosmetic outcomes were satisfactory in every case with no wound-related issues reported during early follow-up.

Conclusions: The RVIAI technique allows safe correction of a broad range of congenital cardiac defects with very low morbidity and favourable long-term cosmetic outcomes. It should be considered a suitable substitute for sternotomy, particularly in cosmetically conscious populations such as young girls.

Novel Use of Right Atrial Appendage Valve in Rastelli Procedure for Right Ventricle to Pulmonary artery conduit

Muhammad Salman Farsi, Haseeb Ahmad, Ali Qaisar, Asad Saulat Fatimi, Syed Aitizaz, Iftikhar

Abstract

We present a case of a 19-year-old male with transposition of the great arteries (TGA), ventricular septal defect (VSD), and severe pulmonary stenosis who underwent a Rastelli procedure with a novel modification. A handmade conduit using bovine pericardium and a right atrial appendage valve was used to establish right ventricle to pulmonary artery (RV-PA) continuity. The patient had a smooth postoperative course with good short-term outcomes. This case highlights the potential of using right atrial appendage valves in RV-PA conduits, particularly in resource-limited settings.

Introduction: TGA with VSD and pulmonary stenosis is a complex congenital heart defect requiring surgical intervention. The Rastelli procedure is a well-established surgical technique for this condition. However, the choice of conduit for RV-PA continuity remains a challenge, especially in developing countries where commercial conduits may be scarce.

Case Presentation: A 19-year-old male presented with cyanosis since birth, palpitations, dizziness, and shortness of breath on exertion. Physical examination revealed bluish discoloration, nail clubbing, and thin emaciated body. Echocardiography and cardiac catheterization confirmed TGA with VSD and severe pulmonary stenosis. Surgical Procedure A midline sternotomy approach was used. A bovine pericardial tube (22 mm diameter) was handmade, and a right atrial appendage valve was harvested and implanted within the conduit. The VSD was not closed, and the left ventricle was baffled to the aorta through the VSD. The RV-PA conduit with the right atrial appendage valve was constructed.

Postoperative Course: The patient was extubated on the first postoperative day and had a smooth recovery. Postoperative echocardiography showed good left ventricular function, no left ventricular outflow obstruction, mild right ventricular obstruction, and mild pulmonary regurgitation.

Follow-up: At one-month follow-up, the patient had similar findings with good functioning RV-PA conduit.

Discussion: Various conduits have been used for RV-PA continuity, including homografts, Contegra, and handmade conduits using bovine pericardium and PTFE membranes. The use of right atrial appendage valves has recently gained attention, particularly in Tetralogy of Fallot and Ross procedures. Our case demonstrates the feasibility of using right atrial appendage valves in Rastelli procedures with good short-term outcomes. This approach is cost-effective and utilizes human tissue, which may behave better than synthetic materials.

Conclusion: This case report highlights the potential of using right atrial appendage valves in RV-PA conduits for Rastelli procedures. While larger studies with longer follow-up are needed, this approach offers an exciting option, particularly in resource-limited settings.

Handsewn vs. Synthetic Valve conduits in RV-PA reconstruction: A Retrospective Cohort Study

Suha Zubairi, Syed Shahabuddin | AKUH

Abstract

Introduction: Right ventricle–pulmonary artery (RV-PA) discontinuity occurs in approximately 5% of congenital heart defects and often necessitates surgical reconstruction using a valved conduit. Standard options include cryopreserved homografts, bovine jugular vein xenografts (Contegra), and synthetic valve conduits. While effective, these prefabricated conduits are often limited by high cost, variable availability, short shelf life, and reduced durability in younger patients or those receiving smaller conduit sizes—frequently requiring reoperation as a child grows.

In resource-limited settings, these challenges are further magnified, restricting access to timely and appropriate surgical intervention. To address these limitations, handsewn trileaflet valve conduits made

from polytetrafluoroethylene (PTFE) and bovine pericardium have emerged as a low-cost, customizable alternative with promising early outcomes. This retrospective cohort study compares the clinical outcomes of handsewn versus synthetic valve conduits used for RV-PA reconstruction at a tertiary care center in Pakistan, evaluating their durability, accessibility, and suitability in a resource-constrained healthcare environment.

Methodology: This retrospective cohort study was conducted at Aga Khan University Hospital, Karachi from January 2007 to December 2019. It included patients aged 0–23 years who underwent RV-PA conduit placement using either handsewn as per Miyazaki and Yamagishi technique or synthetic valve conduits, with at least 12 months of follow-up. Data was collected from medical records and analyzed using SPSS v 23, applying appropriate statistical tests.

Results: A total of 36 patients were included, with ages ranging from 1 to 23 years (mean age 7.3 years). Nine patients were lost to follow-up. The cohort presented with a variety of congenital heart diseases, with pulmonary atresia (PA) with ventricular septal defect (VSD) being the most common diagnosis, observed in 10 patients. Seven patients had previously undergone palliative procedures, including six with modified Blalock-Taussig (BT) shunts and two with pulmonary artery (PA) banding.

Among 36 cases, handsewn conduits were used in 21 patients and synthetic conduits in 15. Mild to moderate pulmonary regurgitation was more common in the handsewn group (2 vs. 1), while moderate-to-severe and severe regurgitation occurred only in the synthetic (contega) group. Overall, handsewn conduits were associated with less severe pulmonary valve regurgitation.

Two patients had undergone prior right ventricle (RV) to PA conduit placement and were undergoing their third redo surgery; among them, one patient in the handsewn graft conduit subgroup underwent pulmonary valve replacement seven years after the initial procedure, while the other developed severe obstruction within the same subgroup. The mean pressure gradient was higher in the handsewn conduits at 33 mmHg, compared to 16 mmHg in the synthetic conduits.

Additionally, mortality was lower in the handsewn group with 2 patients that expired in the handsewn group as compared to 4 in synthetic conduit subgroup.

Conclusion: The use of handmade valve conduits has demonstrated outcomes in both the short and intermediate term that are comparable to those of the synthetic, with no significant increase in morbidity. Given their significantly lower cost and greater availability, especially in low- and middle-income countries, these conduits present a viable and cost-effective alternative.

Adapting Global Innovations to Local Realities: Advancing Pediatric Cardiac Surgery in Pakistan – Lessons from Austria

Zara Shirazi | NICVD

Abstract

Background: Pediatric cardiac surgery in low- and middle-income countries faces persistent challenges in infrastructure, training, and outcomes. Exposure to high-resource centers can offer practical insights for innovation and system improvement. This paper reflects on experiences from a fellowship in Austria to identify transferable strategies for strengthening pediatric cardiac surgery in Pakistan.

Materials and Methods: During a clinical observership at the Medical University of Vienna, key practices were observed across surgical, perioperative, and interdisciplinary domains. Qualitative data were collected through structured observations, informal interviews, and a review of institutional protocols. These findings were contextualized within the challenges faced at the National Institute of Cardiovascular Diseases (NICVD), Karachi.

Results: Four major domains emerged as pivotal for innovation: (1) team-based care models with flattened hierarchies; (2) simulation-based training for surgical and critical care teams; (3) standardized postoperative protocols minimizing variability in care; and (4) a culture of continuous audit and feedback. Potential adaptations for NICVD include implementing early extubation protocols, using checklists for postoperative management, and fostering multidisciplinary collaboration.

Conclusion: International exposure provides not only clinical insights but also inspiration for systems-level reform. By selectively adapting high-resource practices to local contexts, centers like NICVD can improve pediatric cardiac surgery outcomes. This reflective account aims to encourage context-sensitive innovation in other developing cardiac centers.

Outcome of Post-intubation Tracheal Stenosis (PITS) with Primary Resection and Anastomosis

Farhan Ahmed Majeed

Abstract

Objective: To ascertain the outcome of primary resection anastomosis in patients of post-intubation tracheal stenosis (PITS) and the associated morbidity.

Methodology: Patients with tracheal stenosis due to prolonged intubation were included. Exclusion criteria were patients having stenosis due to malignant cause, trauma and glottic stenosis involving vocal cords. Clinical examination, computerised tomography (CT) of neck plus chest and fiberoptic bronchoscopy were done in all the patients, while virtual bronchoscopy were done in 56 cases. Sharp dissection, aided by loupes, was the preferred technique. Thyroid tissue and strap muscle were used as flap for high cricoid lesion. Guardian stitch was applied to all cases. Postoperative elective bronchoscopy was performed after a fortnight.

Results: Among 69 patients, [41 (59.5%) men and 28 (40.5) women] 25 patients were intubated for days >10, 37 for <10 days and 7 for <3 days. Fifty-two (75.3%) patients were under 40 years of age, while 27 patients had tracheostomy incorporated in surgery. Bronchoscopic evaluation of distance from vocal cords showed involvement of the first ring in 09 patients, 1st ring normal in 10, 2 rings normal in 22, while 3 or more rings spared in 28 patients. Length of stenotic segment was <2 cm in 27, between 2-3 cm in 33, and between 3-5 cm in 9 patients. All patients were successfully extubated. Two patients had twin lesions. Seven patients required hyoid bone excision and release. There was one recurrent stenosis managed successfully with dilatation and granulation removal.

Conclusion: Post-intubation tracheal stenosis (PITS) is curable disease. Primary resection and anastomosis remain the gold standard with acceptable morbidity and mortality.

An Experience of Esophagectomy in 379 cases, Outcome and Analysis

Farhan Ahmed Majeed

Abstract

Objectives: The study was carried out to ascertain the outcome of esophagectomies for primary malignant esophageal carcinomas and to determine the outcome and analysis associated with it.

Material Methods: This is a retrospective study of 348 cases of esophagectomies in 14 years from Jan 2010 to Aug 2024. Patients included were of proven endoscopic histopathologically carcinoma oesophagus in which surgery was done with curative intension. On table inoperable carcinoma esophagus were excluded from the study. CT scan staging was employed preoperatively. Approach to oesophagus was dependent on site of lesion. Minimally Access esophagectomy (MIE) and laparoscopic stomach mobilization has been added in the later part of study period.

Results 234 (61.7%) were males and 145 (38.3%) were female patients. 379 had dysphagia to solids in presenting symptoms. Thoracophrenic laparotomies were 111 (29.2%), Transhiatal esophagectomies were 92 (24.2%), and Mackewon esophagectomies were 35 (9.2%), TLPO was done in 42 (11.1%) patients, Minimal invasive esophagectomy was in 55 (14.5%) patients, gastrectomy with roux en y and partial esophagectomy in 39 (10.2%) cases. 188 (49.6%) patients had squamous cell carcinoma, and 166 (43.8%) patients had adenocarcinoma. In Morbidity 31 (8.1%) patients had anastomotic leakage and 27 (7.1%) patients had recurrent laryngeal nerve injury and 46 (12.13%) had anastomotic stricture which was treated by repeated oesophageal dilatations. Orally started on 4th postoperative day. Upper one third lesions were in 45 cases, n=136 in middle oesophagus and n=192 in lower oesophagus. Energy source device was used and feeding jejunostomy was part of procedure.

Conclusion: Voiced concerns regarding the ability to perform a complete esophagectomy can be confidently addressed with the results of our study and as in high volume centers the procedure has acceptable morbidity. Addition of MIE (minimally invasive esophagectomy) has added early, smooth recovery and shorter hospital stay.

Surgical Fixation vs. Conservative Management of Rib Fractures in Blunt Chest Trauma: A Comparative Study of 114 Patients

Farhan Ahmed Majeed

Objective: To compare clinical outcomes between surgical fixation and conservative management in patients with rib fractures due to blunt chest trauma.

Methodology: Patients presenting with respiratory compromise secondary to painful, unstable rib fractures refractory to analgesia were enrolled. This included individuals with flail chest or multiple severely displaced fractures without ARDS. Inclusion criteria comprised patients aged ≥ 16 years with ≥ 4 displaced, painful rib fractures, flail chest, thoracic injuries requiring thoracotomy. Patients with severe head or spinal injury, polytrauma with MOF, ARDS, empyema, or major systemic disease were excluded.

A total of 114 patients were divided into two groups: Group A (n=57) underwent surgical fixation with titanium locking plates with locking screws; Group B (n=57) received conservative management. Follow-up assessments were conducted at 1, 2, and 3 months using clinical evaluation, spirometry (FEV1), and radiographs.

Results: Demographics: Group A had 38 males and 19 females; Group B had 33 males and 24 females. Distribution of associated injuries was hemothorax (Group A: 52; Group B: 46), pneumothorax (51 vs. 53), bilateral rib fractures (8 vs. 9), flail chest (23 vs. 11), clavicle fractures (9 vs. 7), diaphragmatic injury (2 in Group A). Results of designated parameters were; Pain Scores (VAS) on admission: Group A: 8.5; Group B: 8.6 and on discharge: Group A: 3.6; Group B: 7.2. FEV1 (L), at 1/2/3 months: Group A: 2.06 / 2.59 / 2.8; Group B: 1.54 / 1.82 / 2.03 respectively. Oxygen dependence: Group A: 2-3 days; Group B: 5-6 days. Analgesia: Group A: (epidural/oral analgesia), on-demand only; Group B: continuous multi modal (IV/oral/epidural) for ~3 days. Ventilatory support: Group A: 7; Group B: 17 patients. Weaning from ventilator: <3 days (Group A: 4; Group B: 0), 3-5 days (Group A: 4; Group B: 5), >5 days (Group A: 0; Group B: 12). Mortality: Group A: 3; Group B: 9. Hospital stay (mean): Group A: 4.57 days; Group B: 9 days. Return to work (%): Group A: 60% / 90% / 100% at 1/2/3 months; Group B: 10% / 40% / 60%

Conclusion: Surgical fixation of multiple/ flail rib fractures is feasible and effective in appropriately selected patients, even within limited-resource settings. It leads to better pain control, respiratory recovery, shorter hospital stay, faster return to work, and lower morbidity and mortality compared to conservative management.

Key words: Conservative management, flail chest, outcome analysis, rib fractures, thoracic trauma, surgical fixation.

Epidemiology, Injury Patterns, and Clinical Outcomes of Thoracic Trauma from Road Traffic Accidents: A Retrospective Analysis from a Level I Trauma Registry in Karachi, Pakistan

Fizza Iftikhar, Waniyah Masood, Ahmeduddin Agha, Wajahat Hussain Pahlwani

Abstract

Introduction: Thoracic trauma constitutes a leading cause of morbidity and mortality among victims of road traffic accidents (RTAs), contributing to approximately 25% of all trauma related deaths. In low- and middle-income countries (LMICs) such as Pakistan is ranked first in Asia for RTA-related fatalities, the burden is further exacerbated by poor enforcement of road safety regulations and limited trauma care infrastructure. Our study aimed to assess the epidemiological trends, severity of injuries, and clinical outcomes of thoracic trauma resulting from RTAs, using a large trauma registry dataset from a Level I trauma center of Karachi, Pakistan.

Materials and Methods: This retrospective observational study was conducted at the Thoracic Surgery Department of Shaheed Mohtarma Benazir Bhutto Institute of Trauma (SMBBIT), Karachi, from December 2021 to October 2024. Data were retrieved from the institutional trauma registry. Inclusion criteria included patients of both genders who sustained isolated thoracic trauma due to RTAs. Non-RTA mechanisms and pediatric patients were excluded. Demographic variables, injury patterns, and outcomes (ICU admission, mechanical ventilation, and mortality) were analyzed. Multivariate logistic regression was applied to identify independent predictors of mortality, using age, injury severity (> 1 thoracic injury), comorbidities, and presentation time as covariates. A p-value < 0.05 was considered statistically significant.

Results: Out of 456,000 trauma cases, 114,500 (25.1%) involved thoracic injuries, out of which 89,000 were isolated thoracic trauma cases. Males accounted for 79% of cases, with the highest incidence in the 20–29 age groups. The most common injury types included pneumothorax (89%), lung contusions (80.1%), and pleural injuries such as hemothorax (79.8%) and chest wall fractures (60.1%).

Morbidity outcomes included prolonged ICU stays (32.7%) and mechanical ventilation (27.6%). The overall mortality rate was 18.9%. Independent predictors of mortality were analyzed using multivariate logistic regression, included extremes of age ($p = 0.02$), pre-existing pulmonary or cardiac disease ($p = 0.01$), high-impact trauma ($p = 0.03$), and delayed hospital presentation ($p < 0.001$).

Discussion: Our study underscores the substantial clinical and economic burden of thoracic trauma from RTAs in urban Pakistan. While most injuries were survivable with timely interventions (e.g., tube thoracostomy in >90%), delayed presentation and comorbidities significantly increased mortality risk. The age-based injury patterns suggest differential vulnerabilities among age groups. Our study highlighted the need for targeted prevention strategies and early trauma response systems.

Conclusion: Thoracic trauma from RTAs remains a critical public health issue with a high burden of morbidity and mortality. Early diagnosis, rapid transport, and prehospital care are essential in mitigating fatal outcomes. Our findings emphasize the need for strengthening trauma systems and public awareness to reduce RTA-related thoracic injuries and deaths.

Comparison of Uniportal vs Biportal Decortication for Empyema Thoracis: A Retrospective Observational Study

Imran Tahir, Sira Laohathai, Fawad Ali, Jakraphan Yu, Sufyan Ahmad

Objective: To compare the early outcomes of Uniportal vs Biportal video-assisted Thoracoscopic surgery (VATS) Decortication in patients with Empyema Thoracis.

Methods: We conducted a retrospective observational study of 45 patients who underwent VATS Decortication for stage 2 and 3 empyema Thoracis between the ages of 6 and 80 years. Of the patients, 24

underwent a uniportal approach and 21 underwent a biportal approach. We analyzed per-operative duration, ease of mobilization of the lung, proper placement of the chest drain, hospital stay, and the need for subsequent tube adjustments for basal collection.

Results: The Biportal VATS Decortication group demonstrated superior outcomes in several key areas. Patients in the Biportal group had a significantly shorter per-operative duration, easier mobilization of the lung, and more accurate placement of the chest drain. Furthermore, these patients experienced a reduced length of hospital stay and a lower rate of post-operative tube adjustments compared to the Uniportal group.

Conclusion: Our findings suggest that biportal VATS Decortication is associated with better intra-operative and post-operative outcomes, including reduced hospital stay and less frequent need for tube adjustments, when compared to the uniportal approach in this patient cohort.

Vision for Agentic AI-Driven Risk Scoring and National Cardiac Surgery Registry

Imran Ali, Ahson Memon, Bashir Hanif, Azam Jan, Malik Shafqat, Hafeez Ullah, Kanwar Talha, Ahsan Waqar, Mehreen Aziz, Dost Muhammad, Kanwar Talha, Tabba Heart Institute Karachi, Rehman Medical Institute Peshawar

Objective: By utilizing a structured database, the study emphasizes the importance of national registries in improving quality of care, resident training, and medical audit. Such registries not only enable rapid analysis and benchmarking with global data but also support evidence-based clinical decision-making. Ultimately, this research intends to highlight the value of structured information systems in advancing surgical outcomes. In the long term, it seeks to establish the foundation for an AI-driven predictive risk score tailored to the regional population.

Methods: Data will be curated into structured formats to enable advanced statistical analysis and AI-driven modeling. This study will utilize retrospective data from the computerized Cardiac Surgery Registry (CSR) of the Cardiothoracic Surgery Department, comprising adult patients who underwent cardiac surgery. Procedure distributions will be categorized into major surgical groups, and outcomes of isolated CABG cases will be analyzed in terms of morbidity and mortality. The data set will be partitioned into developmental and validation cohorts, where agentic AI methods, including logistic regression augmented with machine learning-based feature selection and validation strategies, will be applied to identify predictors of mortality. Model discrimination and calibration will be evaluated using contemporary statistical indices, with additional validation through AI-assisted resampling and visualization techniques such as funnel plots and outcome stratification. This approach ensured both statistical rigor and adaptability for future integration into predictive AI-driven risk scoring systems.

Results: Analysis of the structured registry data through agentic AI-driven modeling will demonstrate consistent alignment between observed and predicted outcomes for isolated CABG procedures. The AI-enhanced risk model discrimination and calibration will be compared to traditional benchmarks, with the area under the ROC curve surpassing conventional logistic regression outputs and showing robust predictive stability across validation cohorts. Key risk factors such as advanced age, reduced renal function, critical preoperative status, and urgency of procedure will be dynamically weighted by the AI model, enabling more precise mortality prediction than EuroSCORE II and STS algorithms. Funnel plot visualizations integrated with AI-assisted outcome stratification further highlighted deviations between expected and observed event rates, while quintile-based comparisons validated the adaptability of the model across diverse patient subgroups. Overall, the AI-driven framework demonstrated superior capacity for personalized mortality risk estimation, supporting its potential application as a next-generation decision-support tool in cardiac surgery.

Conclusions: This study will demonstrate that leveraging structured clinical registries with agentic AI-driven models can significantly enhance risk stratification in cardiac surgery. By integrating advanced AI methodologies with robust clinical datasets, the framework not only strengthens mortality prediction for isolated CABG but also establishes a foundation for dynamic, personalized decision-support tools. Future expansion into a national registry will further refine these models, driving continuous improvement in surgical outcomes and quality of care.

Effectiveness of Carbon Dioxide Insufflation of Cardiopulmonary Bypass Circuit Prior to Priming in Reducing Neurological Complications in Open Heart Surgery Patients.

Farah Sobia, Muhammad Amir Khan, Vaqar Illahi Paracha | AFIC & NIHD

Abstract

Background: Open heart surgery, facilitated by cardiopulmonary bypass (CPB), is associated with neurological complications such as agitation, delirium, confusion, dementia, TIA and cerebrovascular accidents. Several randomized controlled trials (RCTs) have endeavored to elucidate therapeutic and interventional strategies aimed at mitigating the morbidity and mortality rates in patients who experience perioperative neurological complications. Nevertheless, a consensus regarding the most effective strategy that enhances patient outcomes remains elusive, resulting in the absence of standardized neuroprotection protocols.

Methods: This study aims to evaluate the effectiveness of CO₂ insufflation in the CPB circuit prior to priming in reducing these complications. A randomized controlled trial will be conducted at the Cardiac Surgery department, AFIC/NIHD, involving 150 patients undergoing open heart surgery. Patients will be randomly assigned to receive either CO₂ insufflation at 4 liters for 5 minutes prior to priming or no CO₂ insufflation. The incidence of neurological complications will be compared between the two groups. Statistical analysis will be performed using SPSS version 28.

Results: Will be ready well before conference and will be intimated.

Conclusion: The study's findings are expected to contribute to the development of a standard neuroprotective strategy for optimal neurological outcomes in open heart surgery patients.

First implementation of enhanced recovery after surgery (eras) protocols in cardiac surgery in pakistan: a feasibility study with improved postoperative outcomes.

Adnan Ali Khahro, Alina Siddiqui, Iqra Afzal, Tariq Azam Siddiqi

Abstract

Background: Enhanced Recovery After Surgery (ERAS) protocols are multimodal trans-disciplinary, evidence-based perioperative care pathways designed to reduce surgical stress, accelerate recovery, and improve patient outcomes. Despite widespread adoption in various surgical specialties globally, their application in cardiac surgery remains limited, particularly in low and middle income countries. This study reports the first application of ERAS protocols in cardiac surgery in Pakistan and evaluates their impact on early postoperative outcomes.

Methods: A prospective randomized observational study was conducted at Kutiyana Memon Hospital, Karachi involving 70 patients undergoing CABG surgery between November 2023 and July 2025. Patients were managed using a modified ERAS pathway. Outcomes were compared with a control group managed with conventional perioperative care. Primary endpoints were ICU and hospital length of stay; secondary endpoints included complication rates, and readmission rates.

Results: The ERAS group comprised of 38 patients with a mean age of 53 years. This group showed a statistically significant reduction in ICU stay (mean 47.4 vs. 85.2 hours, $p < 0.01$) and overall hospital stay (mean 5.0 ± 1.0 vs. 6.2 ± 1.5 days, $p < 0.001$) compared with control group ($n=32$). The overall intubation time decreased from 5.3 hours in the control group to 3.1 hours (p -value < 0.01) in the ERAS group. The main postoperative complications included atrial fibrillation and sternal wound infection. A 2.8% overall mortality was observed.

Conclusion: Improved and better outcomes can be achieved with committed, dedicated, innovative and collective efforts of the ERAS team if endorsed in various cardiac surgical units across Pakistan. For most of the world's patients, investing in surgical infrastructure is a clinical imperative.

Clinical Audit: Lack of Arterial Grafts In CABG Patients (July 2017-June 2025)

Asad Ullah, Nouman Khattak, Asad Jamal, Rashid Qayyum, Dr. Azam Jan | RMI Peshawar

Abstract

Background: This clinical audit evaluated arterial graft usage in 4,091 CABG procedures performed at our institution between July 2017 and June 2025. Data were collected using standardized forms and analyzed via SPSS version 20, with GPT-assisted modeling to isolate graft-specific effects.

Only 0.7% (n=30) received multiarterial grafts, while 86.8% (n=3,551) underwent LIMA±vein grafting, and 12.5% (n=510) received SVG-only revascularization. SVG-only patients were older (mean age 62.4 vs 57.5 for LIMA±vein; $p<0.001$), with more diabetes (57.3% vs 49.6%; $p<0.001$) and lower ejection fractions (20.3% with EF<35% vs 5.1%; $p<0.001$).

Postoperative outcomes showed:

- Mortality: 7.1% SVG-only vs 3.4% LIMA±vein ($p<0.001$)
- GPT model attributed 50% of the 3.7% mortality difference to SVG use (OR=2.1, $p<0.001$)
- Multiarterial graft patients had 0% mortality but higher reopening rates (16.7% vs 7.7%; $p=0.002$)

Surgeon-identified barriers to arterial grafting included poor LIMA flow (<20 mL/min), short sternum, and anastomosis challenges.

Conclusion: SVG use itself accounts for ~50% of the mortality difference. Patient risk factors explain the remaining ~50%. Multiarterial grafts, while optimal, require careful patient selection due to technical complexity.

Time to change the traditional way of warfarin management? 1-year follow-up of patients undergone mechanical valve replacement in a developing country

Aamir Iqbal

Abstract

Background: Due to the high incidence of rheumatic cardiac disease in developing world, mechanical cardiac valves remain the preferred choice for younger patients, therefore exposing these population to an increased risk of thromboembolism and bleeding complications. The main objective of the study was to investigate the morbidity and mortality rates linked to mechanical heart valve replacement in patients within a developing country at 1 year.

Methods: This retrospective observational study was conducted on the patients presented Aortic Valve Replacement (AVR), Mitral Valve Replacement (MVR) and Dual Valve Replacement (DVR), at the Cardiac Surgery Department of Peshawar Institute of Cardiology (PIC). The data of 258 patients was collected between a period of two years i.e., from Jan 2021 till Dec 2022.

Results: Out of 258 patients, 37 (14.3%) were readmitted for issues including pericardial effusion, pleural effusion, bleeding, endocarditis, hemorrhagic stroke, stuck valve. The in-hospital mortality rate was 2.7%, and the 1-year mortality rate was 10.3%, with 14 cases (51.86%) attributed to warfarin-related. The number of INR tests conducted after discharge within one year was 8.34 ± 8.268 . Additionally, the number of consultations for INR management in one year was reported as 2.53 ± 3.715 .

Conclusion: According to our findings, warfarin-related complications significantly contribute to mortality and morbidity among patients with mechanical valves in developing countries. Therefore, it is important for newly established cardiac centers developing world to introduce more innovative strategies like establishing warfarin clinic, self-testing device, remote cardiac centers to decrease complications.

Keywords: Warfarin, Mitral Valve Replacement, Aortic Valve Replacement, INR

Saphenous Vein Graft vs. Radial Artery Graft: Searching for the best second conduit in Coronary Artery Bypass Grafting

Aroosh Hanif, Imtiaz Ahmed Chaudhary | AFIC & NIHD Rawalpindi

Abstract

Objective: To compare early in hospital outcomes between Radial Artery (RA) graft and saphenous vein grafts (SVG) in patients undergoing Coronary Artery Bypass Graft (CABG) surgery.

Methodology: Three hundred and ninety one patients with over age of 18 years, regardless of gender who underwent isolated On-pump CABG were recruited through non probability consecutive sampling. Patients were non-randomly allocated in two groups; Group-A (LIMA+SVG) and Group-B (LIMA+RA+SVG). Data on demographic, preoperative, intraoperative, and postoperative characteristics was collected using a structured proforma. In-hospital outcomes and post-operative complications were compared between the two groups.

Results: Out of 391 patients, 76(19.4%) were females and 315(80.6%) were males with median age of 59.00(52.00-65.01) years. Group-A and Group-B had 182(46.5%) and 209(53.5%) patients respectively. Group-A had longer ICU stay duration compared to Group-B [45.50(22.00-91.00) vs. 29.00(21.00-61.00) hours; $p < 0.01$]. In patients receiving three grafts, Group-A showed significantly higher chest tube drainage than Group-B [550.00(380.00-990.00ml) vs. 400.00(250.00-650.00ml); $p = 0.013$]. The OR for type of graft was 2.03 (95% CI: 0.98-4.19; $p = 0.05$), depicting the borderline but significant impact on the post-operative complications.

Conclusion: RA grafts showed potential advantages over SVG as the second conduit in CABG surgery, particularly in improving early in-hospital outcomes. Our findings underscore the potential of radial artery use and support its frequent adoption in clinical practice.

Keywords: Complication, Conduit, Coronary artery bypass grafting, In-hospital outcome, Left Anterior Descending artery, Left Internal Mammary Artery, Radial artery graft, Saphenous vein graft, Patency.

Conclusion: SVG use itself accounts for ~50% of the mortality difference. Patient risk factors explain the remaining ~50%. Multiarterial grafts, while optimal, require careful patient selection due to technical complexity.

Audit of Adherence to Minimum Retesting Intervals In Postoperative Cardiac Surgery Patients

Diyan Muhammad, Khuzaima Tariq, Maliha Sumbul, Aminullah, M Asad Bilal Awan, Suhayb Ahmed Khushk

Abstract

Background: Routine daily blood investigations after cardiac surgery remain common, despite evidence discouraging unnecessary testing. The Royal College of Pathologists' Minimum Retesting Intervals (MRI) Guidelines (G147, 2021) provide clear standards for rational test repetition. Unwarranted investigations not only increase patient harm but also impose a significant financial and resource burden. This audit evaluated adherence to MRI guidelines in a high-volume cardiac surgery center.

Methods: A retrospective audit of 50 consecutive adult cardiac surgery patients was performed. Postoperative blood tests including FBC, UCE, PT/INR, APTT, LFTs, CRP, and ESR were analyzed from Day 1 to Day 5. Practices were compared against RCPATH MRI guidelines. Excessive testing was quantified, and institutional cost data were used to calculate financial waste.

Results: Non-adherence to MRI guidelines was 100%. Every patient underwent daily testing regardless of clinical status. Each received an average of 26 unnecessary tests over 5 days, equating to 52–130 ml avoidable blood loss per patient, contributing to postoperative anemia. The calculated financial waste was PKR 591,000 for 50 patients, largely from redundant FBC, UCE, and CRP tests. Extrapolated to annual surgical volume, this represents a substantial burden on healthcare resources. Excessive phlebotomy also resulted in increased patient discomfort and clinician alert fatigue.

Conclusion: Routine daily phlebotomy is an outdated practice. This audit provides clear evidence that adhering to national MRI guidelines will:

- Improve Patient Care by reducing iatrogenic harm.
- Enhance Clinical Efficiency by reducing alert fatigue and focusing on pertinent results.
- Achieve Significant Financial Savings for the hospital, allowing resources to be redirected to critical areas.

Mediastinal Re-Exploration in Post Cardiac Surgery Patients and its Post-Operative Predictors: A Prospective Cross Sectional Study from a Tertiary Care Centre.

Abdul Ahad Sohail

Abstract

Introduction: Re-exploration of the mediastinum after open heart surgery for bleeding or excessive chest drain outputs remains a common occurrence with its prevalence ranging from 2–11% worldwide. Early re-exploration of the patient with significantly increased chest drain outputs post-open heart surgery can lead to early control of surgical bleeding and decreased complications. We aimed to assess the frequency of re-exploration of mediastinum after adult open heart surgery in our population and associated factors leading to it as this would help the surgical team in better pre-operative planning and counselling of patients.

Materials and Methods: All patients more than 18 years of age undergoing standard open on pump coronary artery bypass grafting, mitral valve replacement or aortic valve replacement or a combination of these procedures at the Section of Cardiothoracic Surgery, Department of Surgery, Aga Khan University Hospital, Karachi, Pakistan were included. Patients with bleeding disorders or those undergoing Re-do cardiac surgery were excluded. ERC approval was attained. Data was collected prospectively on a predesigned Proforma. Data was analyzed on SPSS version 24. A p-value of less than 0.05 will be considered as statistically significant.

Results: A total of 161 patients were included in the study prospectively who met the inclusion criteria. The mean age of patients included were 58 +/- 10 years and 131 (81.4%) were males and 30 (18.6%) were females. The mean pre-operative ejection fraction was 49 +/- 12 %. 80.1% patients were elective and 19.9% underwent urgent / emergent surgeries. 14.9% (n= 24) of patients had increased chest drain outputs post-operatively and 3.1% (n= 5) underwent mediastinal re-exploration. 1 out of 5 patients had coagulopathy and 4 had a surgical bleeder. On univariate and multivariate analysis, predictors for increased chest drain output after surgery included only post-operative use of tranexamic acid (odds ratio (OR) = 0.19; 95% confidence interval (CI) 0.06–0.62, p = 0.0006). On univariate and multivariate analysis, the predictors for mediastinal re-exploration were post-operative FFPs/platelet transfusion (OR = 0.03; 95% CI 0.001–0.89, p = 0.043) and number of PCVs transfused post-operatively (OR = 0.13; 95% CI 0.02–0.93, p = 0.042).

Conclusion: In our study, 80% of patients who required mediastinal re-exploration had a surgical bleeder

and post-operative use of tranexamic acid, and transfusion of pack red cells, fresh frozen plasma and platelets were significant predictors of increased chest drain outputs and mediastinal re-exploration. Hence meticulous haemostasis intra-operatively can lead to decreased blood loss and decreased usage of blood and blood products post-operatively.

Surgical Management of Post-MI Ventricular Septal Rupture: A Decade of Experience and Analysis of Mortality Predictors

Alifa Sabir

Abstract

Background: Ventricular septal rupture (VSR) is a rare but lethal complication of acute myocardial infarction (MI). Despite advances in revascularization reducing its incidence to approximately 0.2%, the condition is still associated with high operative mortality. Identifying predictors of poor outcomes in surgically managed VSR is crucial for improving patient survival.

Methods: A single-center retrospective analysis was conducted on 31 patients who underwent surgical repair for post-MI VSR at Rawalpindi Institute of Cardiology between 2014 and 2023. Patients were categorized into survivors and non-survivors based on 30-day postoperative mortality. Demographic, clinical, echocardiographic, angiographic, and perioperative variables were analyzed using SPSS 23.0.

Results: The cohort included 71% males and 29% females, with a mean age of 56.6 ± 9.02 years. Moderate left ventricular dysfunction was present in 71% of the subjects. Coronary angiography revealed single-vessel disease in 38.5% of patients. The mean time from presentation to surgery was 6.4 ± 4.2 days; early surgery (<7 days) was associated with higher mortality (19.4% vs. 0%). Overall operative mortality was 19.4%. Factors more prevalent among non-survivors included uncontrolled hypertension, renal dysfunction, and occurrence of ventricular arrhythmias. Mean cardiopulmonary bypass time was 126 ± 41 minutes, and the average number of grafts was 1.74

Conclusion: Surgical repair of post-MI VSR continues to carry significant early mortality, although outcomes may be better than previously reported. Early surgery (<7 days), uncontrolled hypertension, renal impairment, and ventricular arrhythmias were associated with increased mortality. Timely diagnosis, optimization of preoperative status, and careful patient selection may help improve outcomes in this critically ill population.

Outcomes of Minimally Invasive Cardiac Surgery in a Newly Established Cardiac Setup

Muhammad Mansoor Tariq

Abstract

Introduction: The establishment of a new cardiac surgical program presents unique challenges, particularly concerning the adoption of complex techniques such as minimally invasive cardiac surgery (MICS). MICS offers potential benefits including reduced pain, shorter hospital stays, and faster recovery. However, the initial learning curve for a new surgical team may influence patient outcomes. This study aims to evaluate the early outcomes of MICS in a newly established cardiac surgery center, focusing on safety, efficacy, and the learning curve's impact on perioperative and postoperative results.

Methods: A retrospective analysis was conducted on the patients who underwent MICS at a newly

established cardiac center from April, 2025 to September, 2025. Procedures included minimally invasive coronary artery bypass grafting, mitral and aortic valve replacement, atrial septal defect (ASD) closure, and tricuspid valve surgery. Data collected included patient demographics, procedural details (e.g., cross-clamp and cardiopulmonary bypass times), perioperative outcomes (e.g., blood loss, transfusion rates, ICU stay), and postoperative outcomes (e.g., length of hospital stay, complications, and 30-day mortality). These outcomes were analyzed in two cohorts: the initial 50 patients and the subsequent 50 patients, to assess the impact of the learning curve.

Results: The mean age of the patient cohort was 55.4 ± 12.1 years, with 62% being male. MICS procedures were successfully completed in 100% of cases, with an overall 30 day mortality rate of 1%. Key complications included re-operation for bleeding (3%), new-onset atrial fibrillation (15%), stroke (1%), infection (0.9%) and AKI (1.4%). A comparison between the initial 50 patients and the later 50 patients revealed a significant reduction in mean cross-clamp time (65 ± 15 min vs. 50 ± 10 min, $p < 0.01$) and cardiopulmonary bypass time (95 ± 20 min vs. 75 ± 15 min, $p < 0.01$) in the latter cohort. Correspondingly, there was a trend towards reduced blood transfusion rates and a shorter ICU stay.

Conclusion: The implementation of MICS in a newly established cardiac surgical program can be achieved with favorable patient outcomes, comparable to established centers. While the initial learning curve is evident in longer procedural times, the surgical team rapidly adapted, leading to improved efficiency and a trend toward better perioperative outcomes. These findings suggest that with dedicated training and a structured approach, a new cardiac setup can successfully and safely integrate MICS into its practice, offering patients the full range of benefits associated with these advanced techniques

Long-Term Follow-Up of Cardiac Surgery Patients in Pakistan: Trends in Patient Survival and Predictors of Long-Term Outcomes (2005-2017)

Mehreen Aziz, Ahson Memon, Imran Ali, Malik Shafqat, Shahzad Iqbal, Hafeez Ullah, Kanwar Talha, Ahsan Waqar, Mehreen Aziz, Mariam, Tabba Heart Institute Karachi

Abstract

Introduction: This study presents the first long-term follow-up of cardiac surgery patients in Pakistan, spanning the years 2005 to 2017. Over this period, more than 15,000 cardiac surgeries, including Coronary Artery Bypass Grafting (CABG), Mitral Valve Replacement (MVR), Aortic Valve Replacement (AVR), Double Valve Replacement (DVR), Atrial Septal Defect (ASD) repair, Ventricular Septal Defect (VSD) repair, and Modified Bentall procedures, were performed. The primary objective of this research was to analyze patient survival rates at various follow-up intervals and identify predictors of long-term outcomes.

Methods: Data extracted from Tabba Heart Institute Cardiac Surgery Registry. Patient follow-up was conducted through clinic visits and telephonic interviews. The study population was assessed at the 1st month, 1st year, and 5th year post-surgery intervals. Data on patient status, including survival, mortality, and follow-up compliance, were collected and analyzed.

Results: At the 1st month follow-up, 98% of patients were alive, with 1% having expired and 1% lost to follow-up. At the 1st year follow-up, 92% of patients were alive, 2% had succumbed to their conditions, and 6% were lost to follow-up. The 5th year follow-up revealed that 77% of patients were alive, 8% had passed away, and 15% were lost to follow-up.

Conclusion: Long-term follow-up of cardiac surgery patients in Pakistan has provided valuable insights into patient survival trends and predictors of long-term outcomes. The significant decline in survival rates from the 1st month to the 5th year highlights the importance of ongoing monitoring and care for these patients. The findings from this study underscore the need for targeted interventions and support for those patients most at risk, as identified by the predictors of long-term survival. This research serves as a foundation for improving the management and postoperative care of cardiac surgery patients in Pakistan and can inform future strategies to enhance patient outcomes and life expectancy.

Association of body mass index with in-hospital mortality and cardiometabolic risk among CABG patients: an eight-year retrospective study

Zobia Naseer, Wajiha Kalsoom, Rizwana, Rashid Qayum, Azam Jan | RMI Peshawar

Abstract

Introduction: Obesity and cardiometabolic comorbidity are common in coronary artery bypass grafting (CABG) and may influence peri-operative outcomes. We summarized BMI distribution and risk, and described crude in-hospital mortality across BMI classes in a contemporary CABG cohort.

Objective: To assess BMI distribution, cardiometabolic risk profile, and crude in-hospital mortality across BMI classes in adult CABG patients (2017–2025).

Methods: Retrospective study of 4,091 adult isolated CABG patients (June 2017–June 2025). BMI was categorized by WHO Asian cut-offs (Underweight <18.5; Normal 18.5–22.9; Overweight 23–24.9; Obese I 25–29.9; Obese II ≥ 30 kg/m²). Outcomes: annual volume; overall BMI composition; distribution of diabetes (DM), hypertension (HTN) and dyslipidemia across BMI classes; and crude in-hospital mortality (within class). Descriptive statistics only.

Results: Annual volume peaked in 2022 (n=779; 19.0%) and was lowest in 2024 (n=210; 5.1%). Overall BMI composition was predominantly elevated: Overweight 16.4%, Obese I 42.6%, Obese II 25.8% ($\approx 84.8\%$ overweight/obese); Normal 13.9%, Underweight 1.3%. Risk factors clustered in higher BMI classes (share within factor in Obese I+II: DM 71.6%, HTN 69.7%, dyslipidemia 68.8%). Crude in-hospital mortality (within class) was: Normal 4.4%, Obese II 4.4%, Underweight 3.8%, Overweight 3.7%, Obese I 3.3%.

Conclusion: Overweight/obesity predominates in CABG and cardiometabolic risk concentrates in Obese I/II, yet crude mortality shows a non-linear pattern (lowest in Obese I, highest in Normal/Obese II). These findings support targeted pre-operative optimization (blood pressure, glycemia, lipids) and motivate risk-adjusted analyses to clarify the BMI–outcome relationship.

SPECTRUM OF CERVICAL INJURIES AND RESULT OF SURGICAL MANAGEMENT IN CUT THROAT CASES

Rafia Zafar

Abstract

Objective: To evaluate the frequency, management and outcomes of cervical tracheal injuries in penetrating neck trauma at a high-volume trauma center.

Methodology: Patients (>12 years) presenting with laryngo-tracheal framework or platysma breach were included and managed according to Advanced Trauma Life Support (ATLS) protocols, followed by surgical exploration and repair. Demographics, mechanism of injury, presentation time, operative details, and outcomes were recorded and analyzed using SPSS version 22.

Results: The cohort comprised of 30 patients with 80% males and a mean age of 34.6 ± 10.8 years. Mechanisms of injury were homicidal (n=13; 43.3%), suicidal (n=11; 36.6%), and accidental (n=6; 20%). All patients sustained tracheal injury with 50% complete transection and 50% anterior wall involvement, often with associated thyroid (n=15; 50%) and esophageal (n=13; 43.3%) trauma. The airway was secured via tracheostomy (n=17; 56.6%) either through the wound or endotracheal intubation (n=13; 43.3%). Morbidity occurred in 53.3% (n=16) of cases, most common being atelectasis (n=14; 46.6%) and wound infection (n=11; 36.6%). Respiratory distress post weaning ventilatory support occurred in (n=6;

20%), and aspiration pneumonia in (n=5; 16.6%), mainly with combined trachea-esophageal injuries. Mortality was 10% (n=3), exclusively among patients presenting >2 hours post-injury with hypoxia and major associated injuries.

Conclusion: Penetrating cervical tracheal injuries require rapid airway stabilization and early surgical intervention to optimize outcomes. Delayed presentation, complete tracheal transection, and associated cervical injuries significantly increase morbidity and mortality.

Keywords: cut throat, penetrating neck injuries, laryngo-tracheal framework, cervical tracheal injury, complete tracheal transection, delayed presentation.

TAVR vs SAVR across the risk spectrum: long-term mortality, pace-maker burden and re-intervention, a meta analysis of randomized trials

Muhammad Abdullah Naveed, Ahila Ali, Anzel Saeed, Bazil Azeem, Zaara Sarmad, Sivaram Neppala

Abstract

Background: Transcatheter aortic valve replacement (TAVR) has revolutionized the treatment of severe aortic stenosis. While established in high-risk patients, its comparative long-term safety and efficacy versus surgical aortic valve replacement (SAVR) across the risk spectrum requires comprehensive evaluation.

Methods: We conducted a meta-analysis of all randomized controlled trials comparing TAVR with SAVR, pooling outcomes of all-cause mortality, stroke, pacemaker implantation (PPM), new-onset atrial fibrillation (AF), and reintervention using a random-effects model. and results are presented as risk ratios (RR) with 95% confidence intervals (CIs). Subgroup analyses were performed by follow-up duration.

Results: Seven trials (n=7,307) were included. While overall mortality was similar (RR 1.06, 95% CI 0.95-1.18), a significant increase emerged with TAVR at 5 years (RR 1.13, CI 1.03-1.23, p=0.01). Stroke risk was equivalent (RR 1.07, CI 0.94-1.22). TAVR drastically reduced new AF (RR 0.40, CI 0.35-0.46, p<0.00001) but increased PPM risk over two-fold (RR 2.24, CI 1.54-3.26, p<0.0001). Aortic valve reintervention was significantly higher with TAVR at 5 years (RR 1.77, CI 1.10-2.85, p=0.02).

Conclusion: TAVR reduces peri-procedural AF but confers a sustained risk of pacemakers and signals higher long-term mortality and reintervention. This durability trade-off is critical for global health. In Low- and Middle-Income Countries (LMICs), where patients are younger and present with bicuspid or rheumatic valves, SAVR remains the pragmatic, cost-effective, and definitive standard. For most of the world's patients, investing in surgical infrastructure is a clinical imperative.

Speed Control Veno-Venous Modified Ultrafiltration a Unique Innovation by the perfusionist of Aga Khan University Hospital.

Abid Hussain

Abstract

Cardiopulmonary bypass is associated with the production of both proinflammatory and anti-inflammatory cytokines and exposes infants to extremes of hemodilution. Improvements in the technology of cardiopulmonary bypass have significantly reduced morbidity following repair of congenital cardiac defects. Modified ultrafiltration has been reported to reduce the amount of body water accumulation, concentrate the circulating blood, and eliminate a variety of low-molecular-weight bioactive mediators such as cytokines and leukocyte elastase. Use of MUF after cardiopulmonary bypass decreases tissue edema resulting in improved pulmonary function with decreased duration of postoperative ventilation, improved left ventricular function, decreased postoperative bleeding, and reducing post operative blood transfusion.

Veno-venous modified ultrafiltration is a modification of this technique, which has the potentially added advantage of eliminating the obligatory left-to-right shunt associated with arteriovenous modified ultrafiltration. This speed control modified ultrafiltration performed in three stages.(MUF, MUF Down, and MUF Up). Modified Ultrafiltration is always initiated immediately after the termination of CPB, when the patient is often in one of the most critical hemodynamic states.

Speed control VVMUF presents a novel and effective modification to traditional ultrafiltration techniques. By allowing dynamic adjustments in ultrafiltration rates, this method optimizes fluid balance, maintains hemodynamic stability, and enhances overall surgical outcomes.

Key words: Veno venous modified ultrafiltration, Hemodynamic Stability, congenital surgery

Efficacy and Safety of Micro-Dose Del Nido Cardioplegia in 700 Consecutive Adult Cardiac Surgeries

Muhammad Yasir Farooq, PNS Shifa Hospital

Abstract

Introduction: Del Nido (DN) cardioplegia, traditionally a cornerstone of pediatric cardiac surgery, is increasingly being adopted in adult procedures. Its single-dose administration offers potential for reduced operative times and enhanced myocardial protection. This study provides a comprehensive, single-center analysis of a micro-dose modified DN solution's efficacy and safety in a large, consecutive series of complex adult cardiac cases, including a significant cohort of high-risk patients with poor left ventricular (LV) function.

Methods: A retrospective review was conducted on 700 consecutive adult cardiac surgery patients who received a micro-dose modified Del Nido cardioplegia between September 2020 and July 2025. Procedures included CABG, AVR, MVR, and DVR. Primary outcomes assessed included a Myocardial Protection Index (MPI), defined by immediate post-clamp rhythm and inotrope requirements, along with postoperative Intra-Aortic Balloon Pump (IABP) usage, duration of mechanical ventilation, and hospital length of stay (LOS).

Results: The study cohort demonstrated remarkably favorable outcomes across all measured parameters, underscoring the solution's protective benefits.

Mortality: Only 3 patients (0.42%) experienced in-hospital mortality.

Myocardial Recovery: A staggering 99.72% of patients achieved spontaneous sinus rhythm upon aortic cross-clamp removal. Only 2 patients (0.28%) required electrical cardioversion / defibrillation.

Postoperative Support: The need for postoperative inotropic support was minimal. Furthermore, only 7 patients (1%) required mechanical circulatory support with an IABP.

Rapid Recovery: The median duration of mechanical ventilation was less than 5 hours, indicating exceptionally rapid post-operative recovery for the majority of patients.

High-Risk Patients: Notably, patients with a pre-operative poor LV function (EF < 40%) showed robust post-operative recovery, highlighting the effective myocardial preservation provided by this technique in a challenging patient population.

Conclusion: The use of micro-dose Del Nido cardioplegia in a large and diverse adult cardiac surgery population, including high-risk patients, is associated with outstanding myocardial protection and rapid postoperative recovery. The extremely low rates of post-clamp shock and IABP requirement strongly support its efficacy and safety as a primary myocardial management strategy in complex adult procedures. These findings warrant further investigation and comparison of this modified technique with standard methods.

Left Heart Bypass(Open Thoracoabdominal Aortic Aneurysm Repair)

Omar Iqbal, Army Cardiac Hospital, Lahore

Abstract

Introduction: LHB is utilized to remove oxygenated blood from the left atrium and return it to the distal descending aorta or femoral artery. This technique allows repair or replacement of the descending thoracic aorta while regulating blood flow, minimizing surface area contact activation and reducing heparin requirement.

Procedure Details: Exposure of left femoral artery LHB established through cannulation of LA and left femoral artery using centrifugal pump Proximal and distal control.

Key words: Left Heart Bypass, Centrifugal Pump, Descending Aortic Aneurysm, Femoral artery

Bridging the Gap: Advancing Perfusion Education in Pakistan Towards Global Accreditation Standards

Iram Arshad, Peshawar Institute of Cardiology

Abstract

Background: Perfusion education in Pakistan is evolving but remains fragmented and misaligned with global benchmarks. International bodies such as the American Board of Cardiovascular Perfusion (ABCP) and the European Board of Cardiovascular Perfusion (EBCP) provide structured frameworks emphasizing accreditation, standardized curricula, and competency-based clinical training. In contrast, local programs lack uniformity, global recognition, and structured evaluation mechanisms. This disparity raises concerns regarding the preparedness of Pakistani perfusionists to meet international competency standards and hinders global mobility. Addressing these gaps is critical for improving patient safety and enhancing the quality of cardiac care.

Objective: To assess the current status of perfusion education in Pakistan, identify key gaps relative to global standards, and propose a strategic roadmap for alignment with international accreditation systems.

Methods: A cross-sectional descriptive study was conducted across five major cardiac centers in Pakistan. Data were collected from 15 perfusion educators, 25 students, and 30 practicing perfusionists using structured surveys and semi-structured interviews. The study explored five domains:

1. Curriculum design – theoretical depth, clinical integration, and alignment with international models.
2. Accreditation status – institutional recognition by ABCP/EBCP.
3. Clinical exposure – quantity and diversity of operative cases during training.
4. Assessment practices – use of structured vs. subjective evaluation methods.
5. Challenges – institutional, educational, and infrastructural barriers.

Results:

Curriculum gaps: Only 30% of programs reported partial compliance with international standards for theoretical knowledge and clinical training. Accreditation void: None of the programs were accredited by ABCP or EBCP; 40% of respondents lacked awareness of such systems.

Clinical exposure: Students completed less than 50% of the internationally required operative cases (typically 150–200 in accredited programs).

- Assessment limitations: 70% of evaluations relied on subjective faculty judgment, with minimal use of competency-based checklists.
- Barriers: Lack of standardized curricula, limited funding, insufficient specialized centers, and inadequate faculty development emerged as the primary challenges.

Conclusion: Perfusion education in Pakistan demonstrates significant misalignment with international accreditation standards. Urgent reforms are needed to ensure global competitiveness and patient safety. Strategies include:

- Developing a national standardized curriculum aligned with ABCP/EBCP frameworks.
- Establishing clinical partnerships to increase operative exposure and case diversity.
- Introducing structured competency-based assessments.
- Pursuing international collaboration for faculty training and program accreditation.

Strengthening perfusion education through alignment with global standards will not only enhance clinical competence and patient outcomes in Pakistan but also improve international career opportunities for local perfusionists.

Keywords: Perfusion education, global accreditation, ABCP, EBCP, curriculum alignment, clinical training, Pakistan

Efficacy and Safety of Milrinone in Pediatric Patients Undergoing Cardiac Surgery: A Systematic Review and Meta-Analysis

Shajie Ur Rehman Usmani

Abstract

Introduction: Despite its widespread use, evidence regarding Milrinone's efficacy and safety in pediatric cardiac surgery remains limited and heterogeneous. We conducted a systematic review and meta-analysis to evaluate the efficacy and safety of Milrinone in this cohort.

Methodology: Following PRISMA guidelines, we systematically searched PubMed, Cochrane, and Google Scholar for studies published between January 2005 and December 2024. Eligible studies included pediatric patients undergoing cardiac surgery with Milrinone used as an intervention compared to placebo or Levosimendan. Primary outcomes were ICU stay, hospital stay, and duration of mechanical ventilation. Secondary outcomes included low cardiac output syndrome (LCOS), 24-hour postoperative mean arterial pressure (MAP), and all-cause mortality. Meta-analyses were conducted using RevMan with a random-effects model.

Results: Twenty-three studies met the inclusion criteria. Milrinone showed no statistically significant benefit in reducing the length of ICU stay, length of hospital stay, or ventilation duration. LCOS incidence was lower in the Milrinone group but not statistically significant [RR = 0.80; 95% CI: 0.52–1.23; p = 0.30]. No significant differences were observed for 24-hour MAP [MD = 0.48; 95% CI: -6.69–7.64; p = 0.90] or mortality [RR = 1.33; 95% CI: 0.93–1.92; p = 0.12]. Heterogeneity across studies was moderate to high.

Conclusion: Milrinone may modestly reduce the incidence of LCOS and ventilation duration, though findings were not statistically significant. No definitive benefit was observed for mortality or length of hospital stay. Further high-quality, standardized trials are warranted to clarify Milrinone's role in pediatric cardiac surgery.

Acid-base changes from intraoperative to postoperative phases in on-pump cardiac surgery: a prospective exploratory cohort

Wajiha Kalsoom, Zobia Naseer, Asad Ullah, Rashid Qayyum, Imran Khan, Azam Jan – RMI Peshawar

Abstract

Objective: To characterize perioperative changes in arterial blood gas (ABG) parameters (pH, PaCO₂, HCO₃⁻, lactate) and explore associations with in-hospital mortality.

Methods: Prospective exploratory cohort (March–May 2025) at a tertiary center; on-pump cases (n=163) through convenience sampling. ABGs were sampled immediately before CPB weaning and 15–30 minutes after ICU arrival. Parameters were classified using standard cut-offs; outcomes were prevalence/severity shifts and mortality associations.

Results: Acidosis increased from 11% intraoperatively to 49.7% postoperatively; severe acidosis rose from 1.2% to 6.7%. Hypocapnia predominated intraoperatively (50.9%), while postoperative hypercapnia reached 37.4%. Bicarbonate distributions were largely stable. Severe hyperlactatemia increased from 25.8% to 48.5% postoperatively. Severe postoperative acidosis showed ~7.6-fold higher mortality versus normal pH; hyperlactatemia was also associated with increased mortality.

Conclusion: The transition off CPB is a critical window for acid-base deterioration. Early postoperative ABG evaluation—particularly for lactate and PaCO₂—may identify high-risk patients and inform targeted interventions. Findings justify protocolized monitoring and larger confirmatory studies.

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04	From Fracture to Fixation: Master Rib Stabilization	Farhan Majeed



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