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Table of Contents

Novel Technique for Surgical Sinus Venosus Atrial Septal Defect Closure via Infraclavicular Approach: A Case Report

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Background

Sinus venosus atrial septal defects (SV ASDs) constitute less than 5% of atrial septal defects and are frequently associated with partial anomalous pulmonary venous drainage (PAPVD). Surgical closure remains the gold standard when percutaneous techniques are unsuitable due to complex anatomy, insufficient rims, or concomitant cardiac anomalies. Median sternotomy is the conventional approach, but minimally invasive techniques have gained prominence owing to their reduced surgical trauma, shorter recovery, and superior cosmetic results. While submammary and trans-axillary thoracotomies are reported for SV ASD repair, infraclavicular access has not previously been described.

Methods

We present the case of a 24-year-old female with SV ASD and anomalous drainage of the right upper and middle pulmonary veins, diagnosed following the episodes of supraventricular arrhythmia during and after the pregnancy. Preoperative evaluation included Holter monitoring, transoesophageal echocardiography (TEE), and electrophysiological ablation of arrhythmogenic foci. Surgical repair was performed through a 5-cm right infraclavicular incision with thoracotomy via the second intercostal space. Cardiopulmonary bypass was established via peripheral cannulation of right femoral vessels and right internal jugular vein (RIJV) with Seldinger technique. A vertical superior vena cava (SVC) incision, placed lateral to the crista terminalis to preserve the sinoatrial node, enabled visualization of the defect and anomalous venous drainage. A patulous autologous pericardial patch was used for single-patch closure to redirect pulmonary venous return to the left atrium. The SVC incision was closed by folding the same patch on its anterolateral wall to prevent narrowing.

Results

The novel infraclavicular approach provided excellent exposure of the SVC–right atrial junction and anomalous pulmonary veins while avoiding sternotomy. Intraoperative TEE confirmed complete defect closure, unobstructed pulmonary venous return, and laminar SVC flow. The patient was weaned off from the cardiopulmonary bypass uneventfully in sinus rhythm and required no inotropic support. Postoperative recovery was rapid, with extubation on the same day, drain removal on postoperative day (POD) one, and hospital discharge on POD four. The incision resulted in an inconspicuous scar, preserving chest wall symmetry and minimizing musculoskeletal trauma.

Conclusions

This case demonstrates the feasibility and efficacy of SV ASD repair through a right infraclavicular approach via second intercostal space. Compared with conventional sternotomy and other minimally invasive incisions, this technique

MAY 2026

International Edition Vol. 24 - Issue 5

TABLE OF CONTENTS

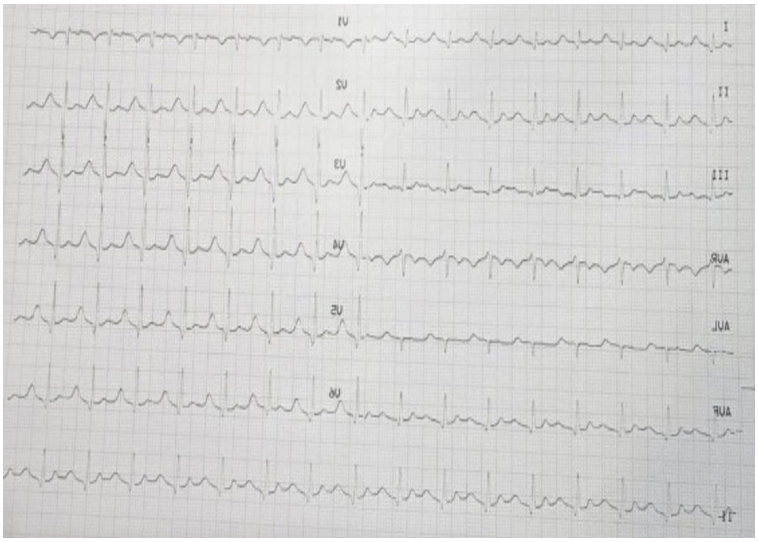

FIGURE 1A *Presurgical ECG*

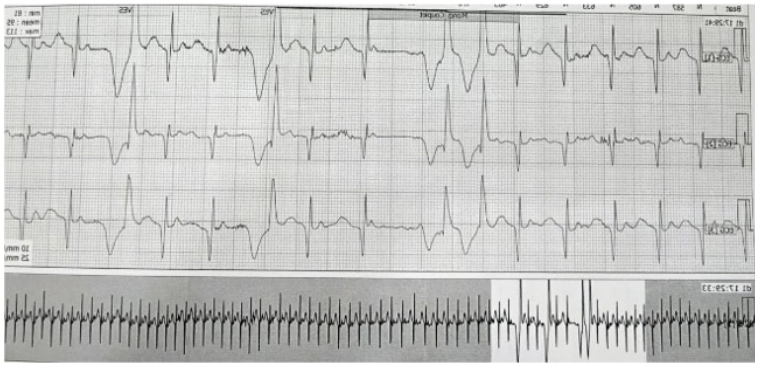

FIGURE 1B *Presurgical ECG*

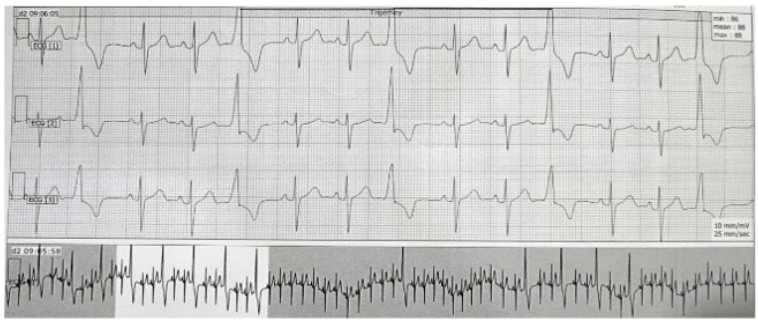

FIGURE 1C *Presurgical ECG*

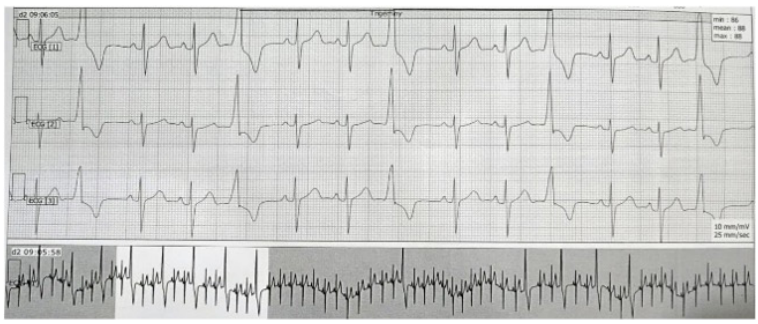

FIGURE 2 *Presurgical Echocardiogram*

combines optimal surgical exposure for complex venous rerouting with improved cosmesis and potentially reduced postoperative discomfort. The approach accommodates standard SV ASD repair strategies—including single-patch, double-patch, V-Y plasty, or Warden procedure—if anatomically required. It also avoids disruption of major intercostal muscle groups involved in shoulder movement and respiratory mechanics, thus, facilitating faster functional recovery. While emerging transcatheter techniques offer alternatives for selective SV ASDs, they remain technically demanding and limited to specialized centres, with risks of device embolization, residual shunt, and pulmonary vein obstruction. Surgical repair through a minimally invasive route remains definitive, reproducible, and adaptable. Larger series and prospective comparisons with other minimally invasive methods are warranted to validate the long-term safety, reproducibility, and functional benefits of this infraclavicular approach.

Keywords

Sinus venosus atrial septal defect, partial anomalous pulmonary venous drainage, minimally invasive cardiac surgery, infraclavicular approach, pericardial patch repair.

Introduction

Atrial septal defects (ASDs) represent approximately 19% of Congenital Heart Diseases.[1] These lesions often go undiagnosed in childhood due to subtle or absent symptoms and are frequently identified in adulthood, where they may present with: breathlessness, palpitations, recurrent respiratory infections, or right heart failure in advanced cases.[2–4] Sinus venosus ASDs (SV ASDs), accounting for less than 5% of all ASDs, are frequently associated with partial anomalous pulmonary venous drainage (PAPVD), particularly involving the right upper and middle pulmonary veins.[5-6] Irrespective of the location and size of the defect, with normal pulmonary artery pressure (PAP), pulmonary vascular resistance (PVR) of < 5 WU, closure of the interatrial communication (either surgical or device) is indicated when there is haemodynamically significant left-to-right shunt of Qp:Qs > 1.5, causing RA/RV enlargement, predisposing to the risk of development of the pulmonary arterial hypertension, atrial arrhythmias and paradoxical emboli in case of Eisenmenger syndrome in the later age.[7-8] Median sternotomy is the conventional surgical approach for the closure of all types of ASDs with or without anomalous pulmonary venous or systemic drainage. Long-term outcome is best with repair at age <25 years, nonetheless, closure at a later age benefits the patient in terms of morbidity (exercise capacity, shortness of breath and right heart failure) and surgical mortality of less than 1% without significant comorbidities.[9] With the technological advancements (Robotics, Endoscopes, and special instrumentation), increasing experience and skills of the surgeons, there is a shift towards the minimally invasive interventions. Percutaneous device closure is the modality of choice for the secundum ASD with favourable anatomy and no pulmonary arterial hypertension. Techniques are also emerging for the transcatheter stenting and closure of the of the Sinus Venosus ASD (SV ASD) and diverting the pulmonary venous return into the left atrium (LA).[10] However, when device closure is not feasible due to insufficient rims, inaccessibility of the vascular access,

concomitant cardiac anomalies needing simultaneous correction, or in scenarios of complications like embolization of the device/ stent, residual defects, occlusion of the pulmonary veins or rare situation of allergy to nickel devices,[11] surgical closure of the ASD is the best option.[12] There are various minimally invasive surgical approaches for OS ASD closure, for instance, partial sternotomy/mini-sternotomy, anterolateral/ posterolateral right thoracotomy via sub-axillary or inframammary incision, video/ robotic assisted thoracoscopic have been described.[12-13] Not only are these techniques comparable in efficacy and safety, but they also demonstrated superior cosmetic results, minimizing surgical trauma, hence shorter hospital stay, less postoperative pain, and early return to functional status.[14] Similarly, these surgical approaches for SV ASD closure have also been described in the literature.[15] Right atrial approach is the most common for SV ASD closure through transverse and longitudinal SVC incision and also for the Warden procedure. Again, there are many ways to prevent SVC narrowing of the longitudinal SVC incision. One is V-Y plasty, another is double patch technique with SVC incision augmentation and third is single patch with/without SVC augmentation. And most frequently, minimally invasive approach described for sinus venous ASD is a right mini-thoracotomy and submammary incision or trans axillary incision.

We report a novel surgical approach for SV ASD repair through a right infraclavicular skin incision and thoracotomy via the second intercostal space in a young adult female. This approach provided optimal exposure for rerouting anomalous pulmonary veins and ASD closure, with excellent postoperative outcomes.

Case Report

A 24-year-old female patient presented in the out-patient department with a history of episodes of palpitation and breathlessness on exertion in her antenatal period since second trimester, spontaneously resolving on rest. She has been managed symptomatically with bed rest and reassurance. She had noticed the similar episodes of palpitation and shortness of breath on exertion, six to seven months post-delivery for which cardiology consultation was done. On further evaluation with Holter monitoring and tranesophageal echocardiography (TEE), supraventricular arrhythmias and SV ASD were diagnosed (**Figure 1 & 2**). Ambulatory Holter monitoring recorded frequent ventricular monomorphic ectopics in singles, couplets and trigeminy. Further, Electrophysiology (EP) study showed inducible typical slow fast Atrioventricular nodal re-entrant tachycardia (AVNRT) and arrhythmogenic foci around right ventricular outflow tract triggering infrequent Ventricular premature complexes (VPCs), which had been ablated with radiofrequency. Post ablation she was started on β-blockers and diuretics. TEE during EP study reported large SVC type ASD, PAPVC (RUPV to SVC), no additional ASDs, dilated RA/RV, mild tricuspid regurgitation (TR), peak gradient 30 mmHg, therefore, she had been referred to paediatric cardiac surgery department for elective surgical repair of SV ASD.

There is no other relevant medical or surgical past history. She was never on any medication before this procedure. On pre-operative evaluation, the patient appeared comfortable at rest, alert and oriented. Heart rate was 76 beats per minute, regular, blood

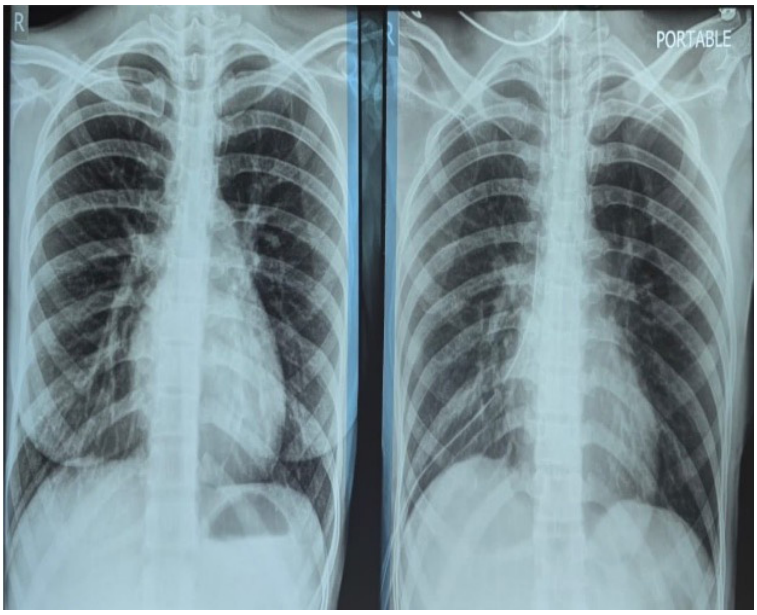

FIGURE 3 *Presurgical and immediate post operative chest X-Ray*

pressure was 120/70 mmHg, respiratory rate of 16 breaths per minute, temperature 97.8° F, weight was 46.3 Kg, height 161 cm and body surface area (BSA) was 1.43 m2. There was no cyanosis, clubbing, pedal oedema, nor jaundice. Pallor was present. On cardiac examination, no jugular venous pulsations were noticed, thus normal venous pressure was presumed. Apex beat was in the 5th left intercostal space, hyperdynamic and was displaced laterally to the left mid clavicular line, left sided precordial lift (RV Heave) was present. The second heart sound (P2) was loud in the 2nd left parasternal space with a grade two systolic murmur. There was no other palpable thrill. There was no hepatomegaly.

Other Investigations

Initial laboratory results revealed: haemoglobin 12.1g/dl, white blood cell count 8.18 k/uL (normal range, 4.0-10.5), 79% (25% to 62%) of which were segmented neutrophils, platelets 309 K/uL (150-450), sodium 141 (136-145 mEq/l), potassium 3.4 (3.5-5.1 mEq/L), glucose 106 (70- 105 mg/dL) blood urea 32mg/dl (15-40 mg/dl), creatinine 0.7 (0.7- 1.3 mg/dl), total serum bilirubin 0.2mg/dl, direct/indirect 0.1/0.1 mg/dl. Serology was negative. She was given detailed relevant information related to the operation including the approaches, post operative outcome and informed consent was obtained. Followed which she was posted electively for SV ASD repair using a minimally invasive approach with an infraclavicular skin incision, via right 2nd Intercostal space.

Patient was anaesthetised, intubated with double lumen endotracheal tube (ET), TEE probe was inserted. Then the patient was positioned supine, with a bolster underneath the right side of the chest. Both sides of the groin and mid chest were kept exposed and draped for peripheral cannulation and to facilitate conversion to the median sternotomy if required. Right common femoral artery and femoral vein were exposed, looped and purse-strings were taken. A 5 cm infraclavicular skin incision was placed on the lateral 2/3rd of the anterior aspect of right second intercostal space. Pectoralis major muscle was divided, while

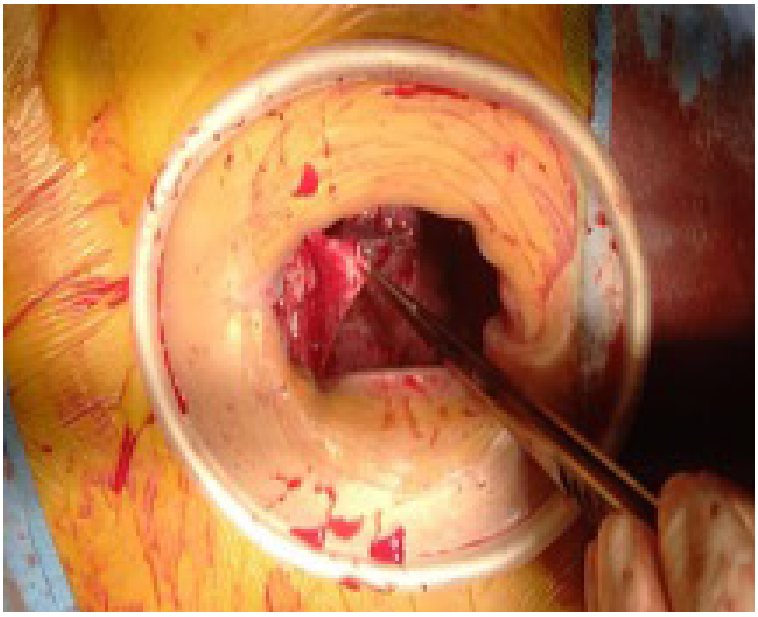

FIGURE 4A *Intraoperative view showing RUPV joining SVC-RA junction*

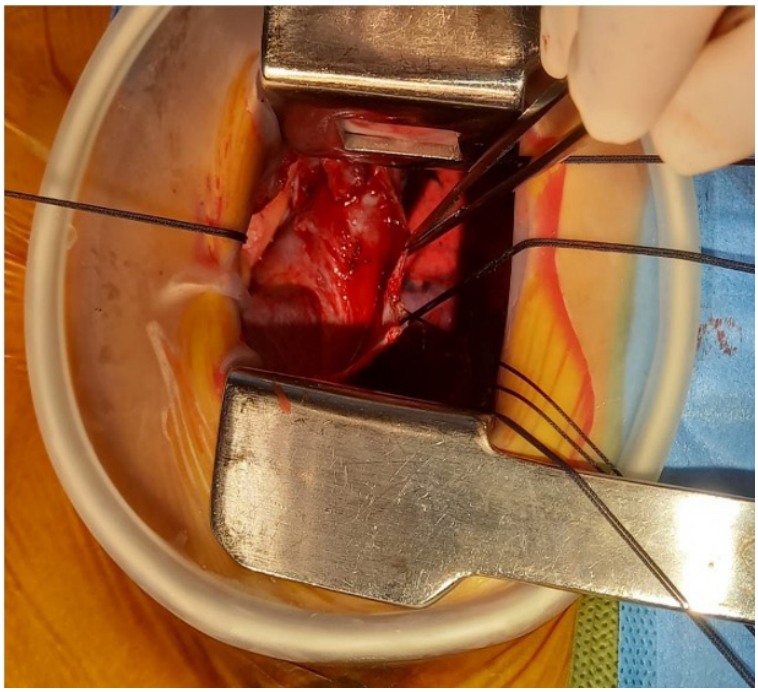

FIGURE 4B *SV-ASD patch fold back technique to augment SVC incision*

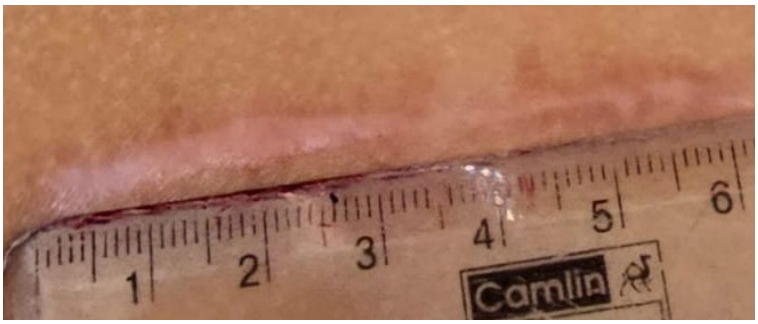

FIGURE 5 *Scar – Demonstrated well-healed post surgical repair four months*

pectoralis minor muscle was retracted. Right pleural space was entered through the 2nd rib space. Right lung was isolated (left lung ventilation continued via double lumen ET). Pericardium was opened and harvested anterior to the phrenic nerve. Femoral artery and femoral vein were cannulated with Seldinger technique to establish the cardiopulmonary bypass (CPB). Right internal jugular vein (RIJV) was cannulated percutaneously via Seldinger technique and cannula was progressed up to the higher SVC. Hence, CPB configuration changed to femoral arterial-bicaval cannulation. Required cardiac dissection was performed to loop the Superior and Inferior Vena Cavae (SVC and IVC), cardioplegia purse string and aortic cross clamping.

Core cooling was started to 32°C. The heart was arrested with antegrade cold Delnido cardioplegia after placement of the aortic cross clamp. Both cavae were snared. A vertical SVC cavotomy incision was placed lateral to the crista terminalis (to avoid injury to the Sinoatrial (SA) Node) and extended to the SVC-RA junction. The anatomy was as similar as mentioned in the TEE report, all the margins of SV ASD, SVC, RUPV openings were visualised (**Figure 4A**). A patulous autologous pericardial patch was used to close the SV ASD by redirecting the RUPV drainage to the Left Atrium (LA) with 6-0 polyprolene suture in continuous manner.

Integrity of the patch was examined by pressuring the left-sided heart. Rewarming was started. SVC cavotomy was closed by folding the same pericardial patch on the anterolateral wall of SVC (**Figure 4B**). SVC and IVC were unsnared. Aortic cross clamp was taken off after Deairing of the heart. The heart resumed activity in sinus rhythm. Gradually, the patient came off bypass with good haemodynamic after restarting ventilation once fully rewarmed. Femoral vein and IJV cannulae were taken out. The femoral artery cannula was removed after the administration of protamine. Haemostasis was ensured. Right pleural drain and 2 RA pacing wires were placed. Ribs were approximated with polyglactin suture, deep and superficial tissues were closed in layers. Intraoperative TEE showed no residual shunt, unobstructed laminar flow from SVC and right pulmonary veins. Patient was shifted to the Intensive Care Unit (ICU) without ionotropic support and extubated once fully awake. Pleural drain and invasive lines were removed on postoperative day (POD) one. Patient was discharged on POD four. Patient kept in follow up (**Figure 5**). Demonstrated well healed scar mark after four months, and Echo confirmed the intact ASD patch with no residual shunt and laminar SVC and pulmonary venous flow.

Discussion

Median sternotomy has traditionally been considered the standard approach for SV ASD repair, as it provides excellent exposure, permits precise rerouting of anomalous pulmonary venous return, and is associated with an operative mortality of less than 1% in otherwise healthy patients.[9] However, cosmetic concerns and increased surgical trauma have encouraged the adoption of minimally invasive cardiac surgery. Right anterolateral thoracotomy, sub mammary and trans axillary incisions, and even robotic or endoscopic assistance have been increasingly reported to reduce postoperative pain, shorten hospital stay, and provide superior cosmetic outcomes.[12-14] Lei et al.[14] and Luo et al.[13] demonstrated that minimally invasive thoracotomy approaches

for ASD repair are comparable to sternotomy in efficacy and safety, while reducing morbidity. Del Nido[12] emphasized that adequate myocardial protection and exposure can be achieved even in complex lesions without a full sternotomy. However, most of these minimally invasive approaches have been described for secundum ASDs; fewer reports address sinus venosus defects, which require more extensive dissection for pulmonary venous rerouting. Multiple surgical techniques have been described to avoid superior vena cava (SVC) obstruction after SV ASD repair:

- **Single-patch repair:** Using a pericardial patch to close the defect and redirect anomalous pulmonary venous return.
- **Double-patch repair:** Adding a second patch to augment the SVC when there is a risk of narrowing.
- **V-Y plasty:** Lengthening the SVC incision to maintain caval diameter.
- **Warden procedure:** Transecting the SVC above the anomalous pulmonary venous entry and re-anastomosing it to the right atrial appendage.

Oliver et al.[6] highlighted the anatomic complexity of sinus venosus syndrome, underscoring the need for excellent surgical exposure to accurately visualize the margins of the defect and anomalous venous return. While these techniques are effective, they are typically performed via sternotomy or larger thoracotomies to ensure a clear operative field.

In this report, we describe a novel infraclavicular approach through the second intercostal space for SV ASD closure. This method provided adequate exposure of the SVC–RA junction and anomalous pulmonary venous return while avoiding the morbidity of sternotomy or large thoracotomy. Compared with more frequently reported submammary or transaxillary incisions,[12-14] the infraclavicular route offers a cosmetically superior scar—particularly important in young female patients—while still permitting femoral cannulation and bicaval control. Importantly, this approach allows the surgeon to employ any of the established SV ASD closure techniques—including single-patch, double-patch, V-Y plasty, or even Warden procedure—if anatomically required. In our case, the patulous pericardial patch provided adequate redirection and the same patch was folded additional SVC augmentation. By placing the vertical cavotomy lateral to the crista terminalis, the sinoatrial node was preserved, aligning with the anatomic principles described by Geva et al.[7] and Fraisse et al.[8] Intraoperative TEE confirmed laminar flow in both the SVC and the redirected pulmonary veins, validating the success of the repair. This incision may also reduce postoperative musculoskeletal pain and shoulder dysfunction compared with sub mammary or trans axillary approaches. The infraclavicular incision avoids cutting through intercostal muscle groups that are heavily involved in arm elevation, thereby minimizing postoperative discomfort and facilitating faster return to normal upper limb mobility—a consideration particularly relevant for young, active patients. Additionally, second intercostal space (ICS) is comparatively larger than the other spaces offering the better operative field access and direct visualisation of the surgical area (SVC-RA junction and pulmonary veins) without much retraction and stretching of the lower rib spaces to reach the cephalic SVC, which is beneficial in the respiratory mechanics and effective cough reflex in the immediate postoperative recovery. Furthermore, particularly in female patients and in male patients with gynaecomastia- second ICS is advantageous as it avoids the retraction of the breast tissue, that is often a hassle to keep the breast tissue away from hindering the operative field. Lastly, infraclavicular approach also prevents the handling of the immature breast tissue in adolescent girls which can sometimes cause asymmetrical breast development as mentioned by Schreiber and colleagues.[16] Adult patients undergoing ASD closure beyond the third decade are predisposed to atrial arrhythmias despite successful anatomical repair.[5] Our patient's supraventricular arrhythmias were addressed preoperatively with electrophysiology mapping and ablation, illustrating the importance of rhythm evaluation in surgical planning. This aligns with Gatzoulis et al.,[5] who demonstrated persistent arrhythmia risk even after defect closure. The infraclavicular approach combines the exposure required for complex SV ASD repair with the advantages of smaller incisions, less musculoskeletal trauma, and improved cosmesis. As Lei et al.[14] reported, minimally invasive approaches enhance early recovery without compromising safety. By demonstrating that even SVC incisions, patch rerouting, and potential augmentation procedures can be performed through this access, our case expands the surgical options available for young adults with sinus venosus defects.

Limitations and Future Directions

This report describes a single case, and while the early postoperative results were excellent, long-term outcomes—including arrhythmia burden, patch durability, and SVC patency—remain to be determined. The infraclavicular approach requires familiarity with peripheral cannulation strategies and careful planning to ensure adequate exposure, which may limit its adoption in centres with less experience in minimally invasive congenital cardiac surgery. Additionally, this incision has not yet been systematically compared with other minimally invasive approaches, such as submammary or transaxillary thoracotomy, in terms of pain scores, shoulder function, cosmesis, and operative times. Future studies involving larger cohorts and multicentre collaboration are needed to validate the safety, reproducibility, and long-term benefits of this approach. Prospective comparisons with established minimally invasive techniques could further define its role in sinus venosus ASD repair and potentially expand its indications to other complex congenital lesions requiring superior vena cava or right atrial exposure.

Conclusion

The infraclavicular approach via the second intercostal space is a novel, minimally invasive technique for SV ASD repair with excellent exposure, effective closure, and favourable postoperative outcomes. This approach may be considered a viable surgical alternative in appropriately selected patients.

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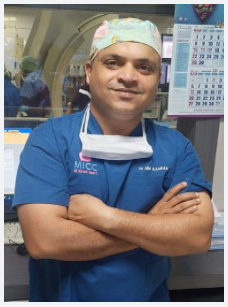

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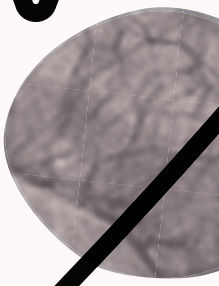

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AUG. 30–SEPT. 2, 2026

Dr. Roxana Mehran is New American College of Cardiology President

Mehran begins a one-year term leading premiere global cardiovascular

Roxana Mehran, MD, FACC, today assumed the role of President of the American College of Cardiology. Mehran will serve a one-year term at the helm of the almost 60,000-member global cardiovascular organization as it works toward its mission to transform cardiovascular care and improve heart health for all.

"I am honored and excited to assume this unique leadership role within the College," Mehran said. "The ACC is a remarkable global organization devoted to improving human health by transforming cardiovascular care. Our members are on the front lines every day seeking evidence, diagnosing diseases and caring for patients."

As president, Mehran is focused on strengthening the College's global partnerships while maintaining close engagement with members to foster growth, opportunity and impact.

"I am optimistic about our future and our collective ability to shape it, guided by science and driven by a commitment to caring for the most vulnerable patients," she said.

A renowned interventional cardiologist, researcher and advocate for women in medicine, Mehran brings a global perspective and a collaborative approach to her presidency. She is an endowed professor of cardiovascular clinical research and outcomes, and a professor of medicine in cardiology and population health science and policy at the Icahn School of Medicine at Mount Sinai in New York, where she completed fellowships in cardiovascular disease and interventional cardiology.

She is also Director of the Women's Heart and Vascular Center at Mount Sinai Fuster Heart Hospital, leading a multidisciplinary program designed to address the unique needs of women's cardiovascular health.

Throughout her career, Mehran has led numerous global studies, contributed to the development of clinical guidelines and authored thousands of peer-reviewed publications. She was named by Clarivate Analytics as one of the most influential scientific minds in their Highly Cited Researchers list for the past eight years. She is the founder and chief scientific officer of the Cardiovascular Research Foundation and the founder of Women as One, an independent nonprofit organization dedicated to advancing opportunities for women in medicine.

Mehran has an extensive history of service to the ACC, including serving as Chair of the Interventional Section Leadership Council, a member of the Board of Trustees and contributing as an author on several guidelines.

She has received several awards, including the 2017 ACC Bernadine Healy Leadership in CV Disease Award and the 2018 Nanette Wenger Award for Excellence in Medical Leadership from WomenHeart: the National Coalition for Women with Heart Disease. In 2019, she received the Ellis Island Medal of Honor and the European Society of Cardiology (ESC) Silver Medal. In 2022, she was awarded the Terry Ann Krulwich Physician-Scientist Alumni Award, Pulse-Setter Champion Award and Women in Cardiology Mentoring Award from the American Heart Association. In 2023, Mehran received the Bahr Award of Excellence from the ACC and in 2025 the Gold Medal from ESC.

Mehran officially assumes the presidency during the Convocation Ceremony at ACC's Annual Scientific Session, taking place March 28-30, 2026, in New Orleans.

Other new officers for 2026-2027 are: Vice President Hani Najm, MD, MSc, FACC; Board of Trustees Members Fred M. Kusumoto, MD, FACC; Andrea L. Price, MS, RCIS, CPHQ, AACC; Finance Committee Chair-Elect/Treasurer 2027-2030 Sanjay Gandhi, MBBS, MBA, FACC; Board of Governors Chair Renuka Jain, MD, FACC; and Board of Governors Chair-elect Dinesh Kalra, MD, FACC.

The American College of Cardiology (ACC) is a global leader dedicated to transforming cardiovascular care and improving heart health for all. For more than 75 years, the ACC has empowered a community of over 60,000 cardiovascular professionals across more than 140 countries with cutting-edge education and advocacy, rigorous professional credentials, and trusted clinical guidance. From its world-class JACC Journals and NCDR registries to its Accreditation Services, global network of Chapters and Sections, and CardioSmart patient initiatives, the College is committed to creating a world where science, knowledge and innovation optimize patient care and outcomes. Learn more at www.ACC.org or connect on social media at @ACCinTouch.

CHOP Physician Honored with William W. Parmley Young Author Achievement Award

The prize honors outstanding first-author research by trainees published in the Journal of the American College of Cardiology and highlights excellence in cardiovascular investigation

Rebecca Josowitz, MD, PhD, of the Children's Hospital of Philadelphia (CHOP), has been named a recipient of the prestigious William W. Parmley Young Author Achievement Award by the Journal of the American College of Cardiology (JACC). She was recognized during the American College of Cardiology's Scientific Session 2026 in New Orleans.

Dr. Josowitz was recognized for her study, "Placental Malperfusion is Associated with Adverse Outcomes in Congenital Heart Disease and With Genetic Variants in Placental Developmental Pathways."

The Parmley Prize honors outstanding first-author research by trainees published in JACC and highlights excellence in cardiovascular investigation. Recipients are selected based on originality, scientific rigor, presentation and overall impact.

Dr. Josowitz was recognized for her study, "Placental Malperfusion is Associated with Adverse Outcomes in Congenital Heart Disease and With Genetic Variants in Placental Developmental Pathways." Leveraging the unique resources of the Children's Hospital of Philadelphia Birth Defects Biorepository, Dr. Josowitz and her team examined 299 fetuses with congenital heart disease and found that evidence of placental malperfusion was common and associated with an array of adverse outcomes including impaired fetal growth, longer hospitalizations, and increased mortality.

In addition, those with placental malperfusion harbored de novo genetic variants in key cardiac and placental developmental pathways, important for angiogenesis and placental function. Their findings suggest dysregulation of shared developmental pathways as a possible mechanism for underlying defects in both placental and cardiac development.

This research advances understanding of how placental health and genetic factors may influence outcomes for patients with Congenital Heart Disease.

Young Adult With Congenital Heart Disease Has Completed Three Marathons...and Counting

It's dangerous for people with congenital heart disease (CHD) to push themselves physically, right? Not necessarily. Alexa Hassan, 27, is proof of that.

Alexa, who grew up in Prospect, Connecticut, was born with tetralogy of Fallot. This rare heart defect limits oxygen flow to the body. At three months old, she had surgery to patch a hole in her heart and insert a valve in her right ventricle to improve blood flow.

The surgery was a success, and Alexa grew up with no physical limitations. In high school, she was an All-American with the cheerleading team and a member of the track and field team. She then participated in track and field as a student at UMass Boston.

After graduating college, Alexa got a job as a nurse in Boston. Her pediatric cardiologist recommended that she transition to a local adult CHD (ACHD) program and referred her to the Mass General Brigham Heart & Vascular Institute. Under the watch of Mass General Brigham cardiologist Doreen DeFaria Yeh, MD, she has since committed herself to exercising and completed three marathons.

"Dr. DeFaria and her team do such a great job," Alexa said. "I've had a really good experience with them, and I wouldn't want to be seen anywhere else."

Offering Personalized, Lifelong Care

Dr. DeFaria is part of the Adult Congenital Heart Disease Program at Massachusetts General Hospital. The program offers personalized, lifelong care for adults like Alexa who were born with a heart defect. A wide range of ACHD specialists, including cardiologists, interventional cardiologists, cardiac surgeons, and others, work together to individualize care for each patient. When they reach early adulthood, Dr. DeFaria stressed, patients should transition to the care of an ACHD specialist who will take the long view in managing their heart health.

"We're focused on all the things we need to do right now to ensure the patient's heart is as healthy as possible 60 or 70 years from now," Dr. DeFaria said. "That means doing a lot of work to monitor for, prevent, and manage complications that can happen decades after a childhood surgery, like heart failure, coronary heart disease, and high blood pressure. Managing people through pregnancy is also a big part of what we do."

Alexa started seeing Dr. DeFaria five years ago. At the time, Alexa went for walks and lifted weights at the gym. They had a

lengthy conversation about the importance of exercise to long-term heart health. Dr. DeFaria suggested adding running to the mix.

"Years ago, we'd tell people with congenital heart disease not to push it and to avoid high-intensity exercise. Unfortunately, that led many people to become overweight or obese, and their hearts becoming deconditioned," Dr. DeFaria said. "In most cases, these patients can safely do much more than we realized then. They can run marathons, they can do triathlons. And we know that when they exercise earlier in life, their heart will be much healthier later in life. That's a message we really try to get across."

Running Boston an Unforgettable Experience

Alexa quickly adopted Dr. DeFaria's recommendation on exercise. She began running while also taking boxing, cycling, and yoga classes.

The next spring, she attended the Boston Marathon for the first time. Cheering on the thousands of participants passing by inspired her to want to run it herself.

"I was thrilled that she was so motivated to keep pushing her cardiovascular fitness," Dr. DeFaria recalled. "We want to encourage congenital heart patients to exercise as much as they want to, safely."

To that end, the ACHD Program—in partnership with the Heart and Vascular Institute's Cardiovascular Performance Program—conducts specialized stress testing to check how the heart holds up to intensive exercise. If the patient does well, they can often exercise without limitations.

That was the case with Alexa, who ended up running the 2024 Boston Marathon along with several friends. She was nervous

beforehand and battled through fatigue and pain through most of the race. That only made crossing the finish line that much sweeter.

"Dr. DeFaria and her team do such a great job. I've had a really good experience with them, and I wouldn't want to be seen anywhere else."

– Alexa Hassan, patient

"Once the adrenaline wore off and I got my medal, I could barely walk. My feet were bleeding and blistered so badly," she said. "It was a roller coaster of excitement and happiness along with dread and suffering. Though once you finish, you kind of forget about the bad stuff."

More Marathons in Her Sight

Alexa couldn't wait to see Dr. DeFaria for her annual checkup that summer. She showed up wearing her Boston Marathon gear and medal. Dr. DeFaria greeted her with a huge hug.

Alexa holds her marathon medal

"Nothing makes us happier than knowing our patients are accomplishing their goals. It's a wonderful feeling to empower people to live their best life," Dr. DeFaria said. "When she sent me photos after she finished the race, I almost cried. She's such an inspiration for patients who think they could never do that."

Since running Boston, Alexa and her friends have also completed the New York City and Berlin marathons. Their goal is to run the rest of the six original World Marathon Majors—Tokyo, London, and Chicago—in the next couple years.

Alexa, who now works as a pediatric cardiac nurse, finds special meaning in running.

"Yes, it's something I do for fun and as a hobby, but it's also a way for me to give hope to the children and families I care for," she said. "I talk to a lot of parents, and some children who are old enough, about my heart and my running. I also cite (ex-professional snowboarder) Shaun White as someone else with tetralogy of Fallot who is a great success story."

Good Habits Will Pay Off

Moving forward, Alexa will continue to see Dr. DeFaria once a year. Dr. DeFaria stays up to date on the latest guidelines for managing patients with tetralogy of Fallot, while Alexa has various tests each year to make sure her heart is healthy.

Like most adults with tetralogy of Fallot, Alexa likely will need to have her pulmonary valve replaced one day. Due to her cardiac and overall health, however, Dr. DeFaria believes she won't have to worry about that for many, many years.

"I'm really proud of her," Dr. DeFaria said. "Running a marathon is an amazing achievement. But what's even more remarkable is her consistent dedication to her health and the habits she has developed that will benefit her decades down the line."

From Humble Beginnings to a Century of Impact: The Life and Work of Dr. Ramon Rodriguez-Torres

Jon Stojan

At 100 years old, Dr. Ramon Rodriguez-Torres has built a career that reflects the breadth of what medicine can accomplish. His life's work, spanning continents and decades, shows that medicine is not only about treating illness, but about building systems that prevent it and communities that sustain it. As his son Raymond Rodriguez-Torres shares, "He didn't just want to treat patients. He wanted to change the way medicine worked." That ambition would shape a career defined not only by clinical excellence, but by institution-building and forward-thinking leadership.

Born in Havana in 1926 and raised in a modest household, Rodriguez-Torres developed an early sense of responsibility and curiosity. Those formative years instilled values that would guide his path through medicine. He pursued his medical degree at the University of Havana, graduating in 1951, where he distinguished himself through academic rigor and a relentless drive to learn. His early career took him to leading institutions in Cuba and later Europe, including training at the Royal Infirmary in London and the University of Manchester. Exposure to emerging practices in pediatric cardiology sharpened his clinical focus and broadened his perspective on global healthcare delivery.

It was his decision to leave Cuba in 1960 that marked a defining turning point. Arriving in the United States as an immigrant physician, he entered a competitive and often unforgiving system. "He was an immigrant, a young father, and one of many foreign-trained doctors trying to prove himself," his son says. That context shaped both his resilience and his commitment to excellence.

Building Modern Pediatric Care

Rodriguez-Torres quickly distinguished himself in New York, where he trained and later led pediatric cardiology efforts at Kings County Hospital. There, he played a role in developing one of the earliest pediatric intensive care units in the United States, focused on children undergoing complex cardiac procedures. This work reflected a broader understanding that specialized care environments were essential for improving outcomes. By integrating intensive monitoring, surgical recovery, and emerging treatment methods, he helped redefine how critically ill children were treated.

His leadership continued to expand when he was appointed Chairman of Pediatrics at the Medical College of Ohio in the 1970s. In that role, he advanced both academic research and clinical training, reinforcing the link between education and patient care.

Transforming Miami's Medical Landscape

Rodriguez-Torres's most enduring institutional impact came in Miami. In 1981, he assumed leadership at what would become Miami Children's Hospital, now Nicklaus Children's Hospital. Under his direction, the hospital evolved into an internationally recognized center for pediatric care. He introduced initiatives that extended far beyond traditional hospital operations. He established a Continuing Medical Education department to ensure physicians remained at the forefront of evolving practices. He also launched a telemedicine training program, expanding access to specialized pediatric expertise in underserved areas.

He created rotations that connected academic medicine with community-based pediatricians, ensuring that knowledge translated into everyday care. He also founded a Pediatric Research Center focused on genetic birth defects and supported the development of an international pediatrics journal. These efforts reflected a consistent philosophy: sustainable healthcare requires both innovation and education. "He was a builder of institutions and of people," says Raymond.

Photo courtesy of Raymond Rodriguez-Torres

Prevention as a Guiding Principle

Among his most forward-looking contributions was his focus on preventive medicine. Long before prevention became a central theme in healthcare strategy, Rodriguez-Torres advocated for early intervention at the community level. "He believed that healing should begin before a child ever got sick," says Raymond. This perspective led to the creation of preventive medicine initiatives that emphasized education, early screening, and community engagement. By shifting attention upstream, he helped lay the groundwork for a more sustainable approach to pediatric healthcare. His work anticipated broader industry movements that now prioritize prevention as both a clinical and economic imperative.

Legacy Shaped by Resilience and Compassion

Behind the professional achievements lies a deeply human story marked by personal loss and enduring compassion. The death of his infant daughter in Cuba and later the passing of his granddaughter decades later brought profound grief into his life. In a poignant moment described by his son, Rodriguez-Torres fulfilled the role of physician even in personal tragedy, calling the time of death for his granddaughter. These experiences appear to have deepened his commitment to care and reinforced a view of medicine that extends beyond technical skill to encompass empathy, presence, and humanity.

Rodriguez-Torres retired in 1996, but his influence continues to shape pediatric care through the institutions he built and the professionals he mentored. His legacy is visible not only in hospital systems and academic programs, but in the countless patients and families impacted by his work. At 100, his life offers a considered example of how vision, discipline, and compassion can converge to create lasting change. His story underscores that medicine, at its best, is both a science and a service.

MAY

16TH - 19TH

AEPC 2026
Padua, Italy
https://www.aepc2026.org/

18TH - 19TH

5th CME Cardiologists Conference
Athens, Greece
https://cardiologists.plenareno.com/

JUNE

16TH - 19TH

ACHD 2026
Cincinnati, Ohio, USA
https://www.cincyhearteducationseries.org/achd2026

AUGUST

14TH - 17TH

2026 Pediatric and Audlt Congenital Cardiology Review Course (Mayo Clinic)
Los Angeles, California, USA
http://ce.mayo.edu/

30TH - SEPT 2ND

PICS Symposium 2026
San Diego, California, USA
https://www.picsymposium.com/home.html

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Yale New Haven
Children's Hospital
New Haven, Connecticut

Pediatric Cardiologist Clinical Associates
University of Chicago
Comer Children's Hospital
Chicago, Illinois

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Ochsner Children's Hospital
New Orleans, Louisiana

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