

[NM-335] High risk re-entry sternotomy in an infant for surgical repair of a giant pseudoaneurysm of the right ventricular outflow tract

<sup>1</sup>Maxwell B, <sup>2</sup>Wise-Faberowski L

<sup>1</sup>Johns Hopkins University , Baltimore , MD, USA; <sup>2</sup>Stanford University , Palo Alto , CA, USA

---

#### Background:

Improved survival from congenital heart disease has led to an increasing need for complex reoperation by re-entrant sternotomy.

#### Case Presentation:

The case was an 11-month old, 6.2kg female infant with TOF, PA, and MAPCAS. She was s/p AP window with collateral ligation (2 mos), followed by complete intracardiac repair with VSD closure, AP window take-down, bilateral patch PA-plasty, and placement of a 9mm aortic homograft from the RV to the PA (8 mos). On follow-up, TTE showed a large, abnormal echolucent structure in the anterior mediastinum with flow communication into the right ventricle to pulmonary artery conduit, and mild to moderate conduit regurgitation. Cardiac magnetic resonance imaging and right heart catheterization demonstrated a pseudoaneurysm along the anterior mediastinum and in direct contact with sternotomy wires that arose from the superior aspect of the right ventricular outflow tract and measured 6.3 x 5.3 x 3.0 cm. There was flow communication with the conduit, with low-velocity turbulent swirling flow in the pseudoaneurysm.

The child was given midazolam premedication, brought to the operating room with left femoral central venous access in place. After uneventful induction and tracheal intubation, the left femoral artery and right internal jugular vein were cannulated under ultrasound guidance. Aminocaproic acid was administered (150mg/kg bolus prior to incision, 150mg/kg in the bypass prime, and 75mg/kg/hr infusion).

Initial surgical dissection involved isolation of the innominate artery and the inferior vena cava at the suprasternal and subxyphoid aspects of the skin incision prior to reentry sternotomy, to allow for cannulation for bypass. Heparin was administered and the remainder of surgical dissection was carried out with the bypass circuit primed and surface cooling initiated. The giant pseudoaneurysm was exposed with meticulous dissection, and found to occupy nearly the entire anterior mediastinum, obscuring all cardiac structures below. Bypass was initiated and the pseudoaneurysm was decompressed, at which point it could be appreciated that the proximal suture line of the conduit hood was intact but the proximal homograft tissue had disrupted to create the connection into the pseudoaneurysm. The patient received no more than standard amounts of allogenic blood products (2 units of packed red blood cells and 1 unit of frozen plasma on bypass, 2 units of cryoprecipitate and 1 unit of volume reduced platelets post-bypass). She was weaned from cardiopulmonary bypass on milrinone (0.5 mcg/kg/min) and had an otherwise uncomplicated postoperative course.

#### Discussion:

In the largest existing case series of reentry sternotomy in congenital heart disease, the principle risk factors for cardiac injury were number of prior sternotomies and the presence of a right ventricle to pulmonary artery conduit. Lysine analogue antifibrinolytics are effective in reducing microvascular hemorrhage associated with reentry sternotomy. Adequate venous access is needed, and blood products should be available and the cardiopulmonary bypass circuit primed at the time of incision. Close communication and coordination between the surgical, anesthesia, and perfusion teams is essential.

---