A Minimally Invasive Approach for Cardiac Hemangioma Resection in a Teenager

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Introduction

- Cardiac hemangiomas are benign primary cardiac tumors [1]
- Incidence of less than 1 in 100,000 [1]
- Predominately asymptomatic and slow growing, although symptoms include exercise intolerance, syncope, arrhythmias, angina, or stroke
- Symptomatic patients traditionally approached via median sternotomy [1,2]
- **Since 2018, we have been performing procedures of the right ventricular outflow tract and pulmonary valve through a 5 cm left anterior mini incision (LAMI)** [3]
- Single institution results show no difference in outcomes between those undergoing exposure via LAMI vs. median sternotomy for right sided lesions [4]

Case

Minimally invasive hemangioma resection in a symptomatic 15 year old male through a 5 cm incision in the left third intercostal space

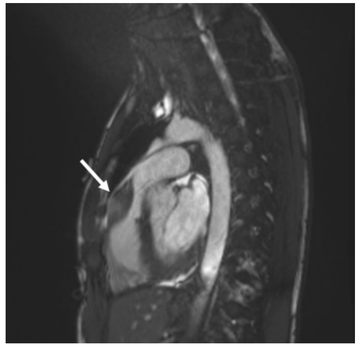


Figure 1. Preoperative Assessment. Cardiac hemangioma emanating from the inferior aspect of the pulmonary valve within the right ventricular outflow tract. While echo gradients were not concerning, patient reported exercise intolerance and recent athletic restrictions from his school based on the presence of his tumor.

Operative Course

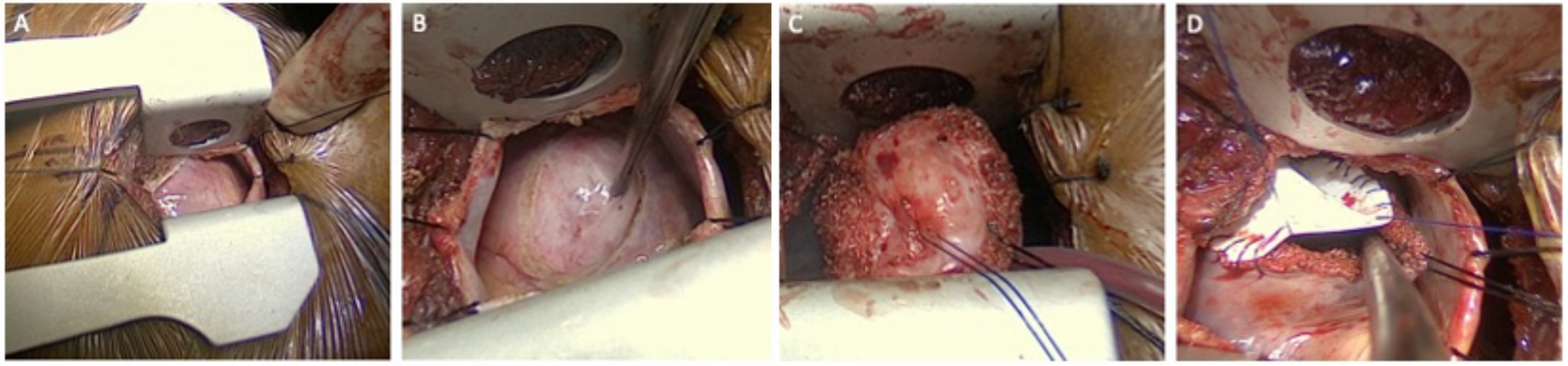


Figure 2. Intraoperative Exposure and Repair. Preoperative imaging including cardiac MRI and point of care ultrasound prior to incision confirmed the location of the tumor. Peripheral cardiopulmonary bypass established via percutaneous placement of a 25F multistage venous cannula in the right femoral vein and a 19F single stage venous cannula in the left subclavian vein. After left femoral artery cut down, a 6 mm Dacron graft completed the arterial circuit in an end-to-side fashion. Dissection to the pericardium was completed through a 5 cm incision in the left third intercostal space. Patient was then placed on bypass to decompress the right heart and facilitate safe entry into the pericardium and improve exposure. The tumor was circumscribed and enucleated using electrocautery. The resulting defect was closed with 3 cm Gor-Tex patch. The incision was closed in layers and a single 24F Blake drain was left in the mediastinum.

Details Regarding the Case

- Indications for surgery were patient reported exercise intolerance and athletic restrictions at school
- Preoperative echo with no obstruction based on Doppler and an estimated end diastolic pressure of 31 mmHg
- Presumed to be a dynamic right ventricular outflow obstruction
- Bubble TEE without septal defects, allowing case to be performed beating heart
- Chest tube removed POD 1, **patient discharged POD 2**

Latest Follow Up

- Last follow up was 12/16/21 – 6 months after surgical repair
- Patient denies exercise intolerance, shortness of breath, chest pain, or palpitations
- **Played starting running back in football during most recent season**
- **Physical exam now without evidence of murmur**
- Echo without evidence of PI and normal biventricular function

Conclusions

- **LAMI continues to be a suitable minimally invasive approach for lesions involving the right ventricular outflow tract and pulmonary valve**
- Advantages of this approach include a smaller incision, avoidance of sternal precautions, and potentially improved cosmesis particularly for patients without prior history of median sternotomy

References

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4. Thornton S, Kang L, Nellis J, et al. Comparison of median sternotomy and left anterior mini-incision for pulmonary valve replacement following primary tetralogy of Fallot repair. *Cardiol Young.* Jan 2022; Online ahead of print:1-5.

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