DYNAMIC OCCLUSION OF THE CORONARY ARTERIES: A RARE COMPLICATION OF PERICARDIAL RESECTION

Zachary J Fleissner, DO, MS[1]; John Bradshaw, MD[2]; Ashley V Fritz, DO[1]; Gohalem G Felema, MD[1] ; [1]Mayo Clinic Jacksonville; [2]Nemours Medical Center Jacksonville

INTRODUCTION

Osteosarcomas are the most common primary malignancy of bone in children and adolescents characterized by the production of osteoid by malignant cells with an approximate incidence of 750 to 900 cases per year in the United States. Metastasis with osteosarcomas is common; approximately 80% of osteosarcoma metastases involve the lungs. The objective of this case report is to present a unique surgical solution to a complication of lingual metastasis of osteosarcoma.

Our patient was a 21 year old female with left lower leg osteosarcoma diagnosed at 14 years old status post tumor resection and limb salvage in 2012 with post-operative chemotherapy complicated by left upper lobe lung metastasis status post resection in 2014. On CT scan in 2015, the patient was found to have metastasis to the lingula with adherence to the pericardium.

She underwent exploratory thoracotomy with wedge resection of a portion of the lingular lobe as well as a 3cm x 3cm piece of pericardium was excised. During surveillance echocardiogram in 2018 was found to have abnormal asymmetric left ventricular apical dilation with normal LV systolic function.

FIGURE 1: CARDIAC MRI

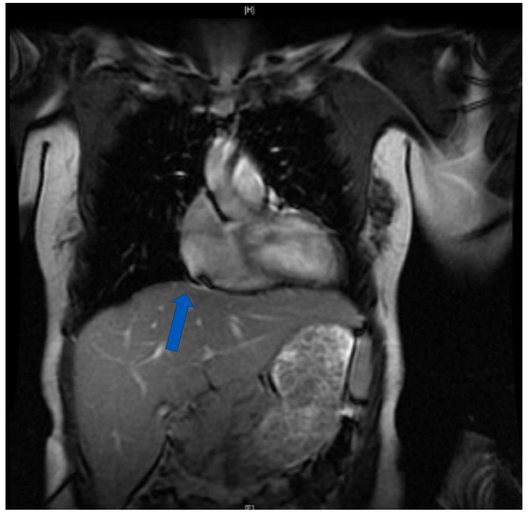

Figure 3: Cardiac MRI showing indentation of mid-apical RV wall (blue arrow)

METHODS

This prompted further investigation with a cardiac MRI and coronary angiography. The coronary angiography demonstrated normal coronary anatomy with an indentation inferiorly in the RV wall consistent with constriction by the pericardium. The Right Coronary Artery was noted to have dynamic, complete occlusion near the obtuse marginal artery. Also noted was a similar dynamic complete occlusion of the circumflex coronary artery. The cardiac MRI demonstrated a discrete indentation into the mid to apical right ventricular wall which appeared to be from an external constriction. The herniation of the apical half of the heart through the pericardial opening created a circumferential constriction around both ventricles (Image 1 and 2). Given the dynamic occlusion of the coronary arteries and abnormal diastolic ventricular filling, she was referred to cardiothoracic surgery for further evaluation and management. The patient was scheduled for median sternotomy and surgical repair of pericardium with bovine pericardium (image 3). She underwent uneventful induction of anesthesia with 250 micrograms(mcg) of fentanyl, 30 miligrams(mg) of ketamine, 2mg of midazolam and 60mg of 2% lidocaine. Post-induction arterial line, central line and large bore peripheral intra-venous access were established.

FIGURE 2

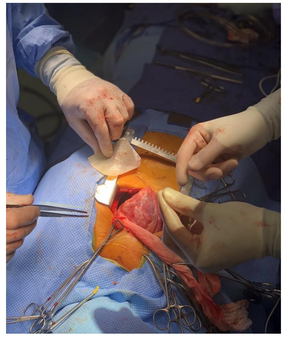

Figure 2: Intraoperative view showing biventricular herniation through the pericardial window

FIGURE 3

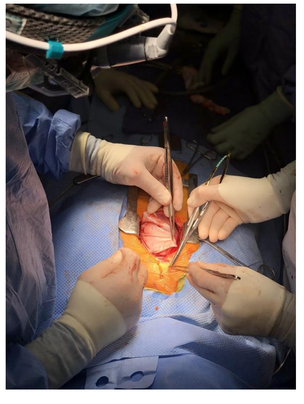

Figure 3: Intraoperative Repair with Bovine Pericardium

CONCLUSIONS

- Creation of a pericardial window near the lingula can create an environment where a transient constrictive cardiac physiology can exist on echocardiography
- Radiologically similar to congenital absence of left hemipericardium
- The subsequent dynamic occlusion of the coronary arteries can be treated via surgical repair of pericardium

REFERENCES

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