Acute Coronary Thrombosis in a Child with Kawasaki's Disease and Giant Coronary Aneurysms: BiVAD as a Bridge to Transplantation

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Introduction

This report describes a 4 year old child with Kawaski's disease and giant coronary aneurysms that presented with acute coronary ischemia secondary to aneurysm thrombosis. Initial stabilization by cardiac catheterization was followed by re-thrombosis and severe LV dysfunction and ventricular arrhythmias. We describe the complex nature of this case and management using ECMO, paracorporeal LVAD, paracorporeal BiVAD, addition of an oxygenator to the BiVAD system for management of ARDS and successful bridge to orthotopic heart transplantation.

Case Report

A 4 year (19 kg) boy with Kawaski's disease and giant coronary aneurysms, on prophylactic enoxaparin and aspirin, suffered acute coronary ischemia secondary to thrombosis of the aneurysm (Fig. 1). He was initially rescued in the catheterization lab with recanalization of the left coronary system. After initial improvement of cardiac function and inotropic requirement, re-thrombosis of the aneurysm resulted in end stage heart failure and ventricular arrhythmia. After stabilization with femoral-femoral venoarterial ECMO, the child was transitioned to a paracorporeal LVAD via a transeptal LA cannula and a femoral chimney graft. 3D fit testing of an intracorporeal system was performed (Fig.2) and was found to be acceptable. However, secondary to incessant ventricular arrhythmias and secondary right ventricular failure he was transitioned to paracorporeal BiVAD support. He was extubated and participating in rehabilitation activities awaiting heart transplantation, when he developed ARDS and bilateral pneumothoraces (Fig.3). He was successfully managed by splicing in a oxygenator into the RVAD system (Fig.4). Upon recovery of the pulmonary insult he was converted back to a standard BIVAD system (Fig.5) and ultimately bridged to a orthotopic heart transplant.

Conclusion

This case describes the complex but successful management of a very difficult problem in the pediatric population. The patient required several available modalities of mechanical support and innovative strategies to support the child while awaiting a donor heart for transplantation.

Disclosure

I will not discuss off label/investigational use of any drugs or devices.
None of the authors have any relevant financial relationships related to this presentation.

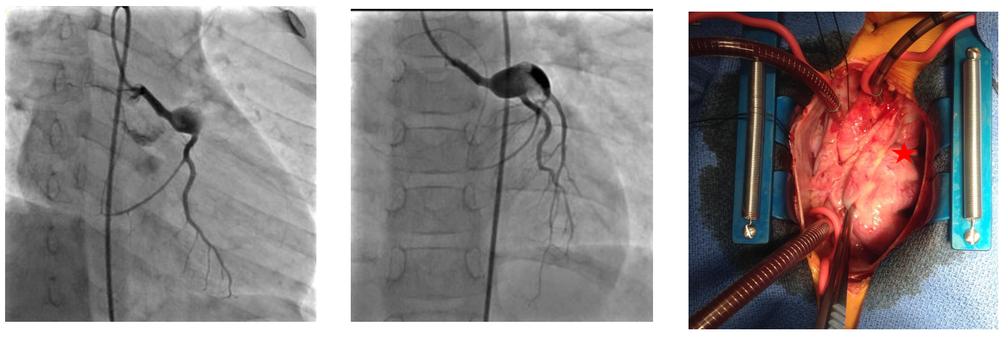


Fig.1: Thrombosed coronary aneurysm at cardiac catheterization and intra-op.

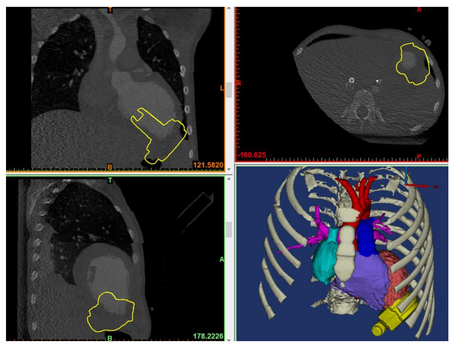
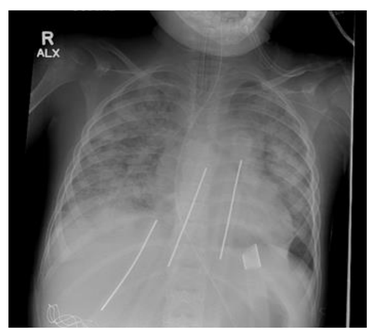
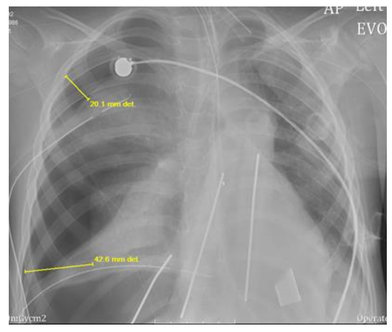


Fig.2: 3D Fit testing of intracorporeal LVAD

Fig.3: CXR on BiVAD support with fluffy infiltrates and pneumothoraces (ARDS)





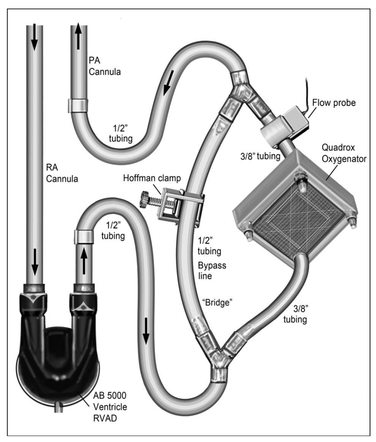


Fig.4: Addition of membrane oxygenator
(Betit P et al. J Extra Corpor Technol. 2011 Dec;43(4):264-6)

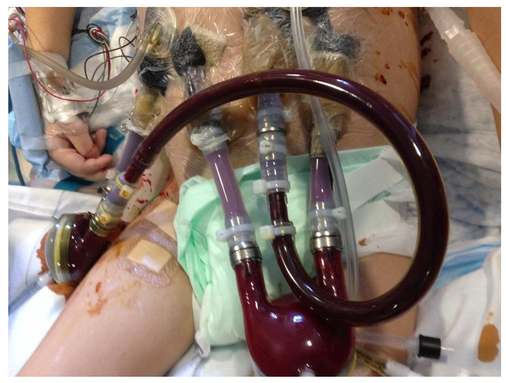


Fig.5: Appearance of the BiVAD after oxygenator removal