# Bivalirudin, Dialysis, and Biventricular Assist Devices: A Pathway to Heart-Kidney Transplant in a HITT Positive Patient

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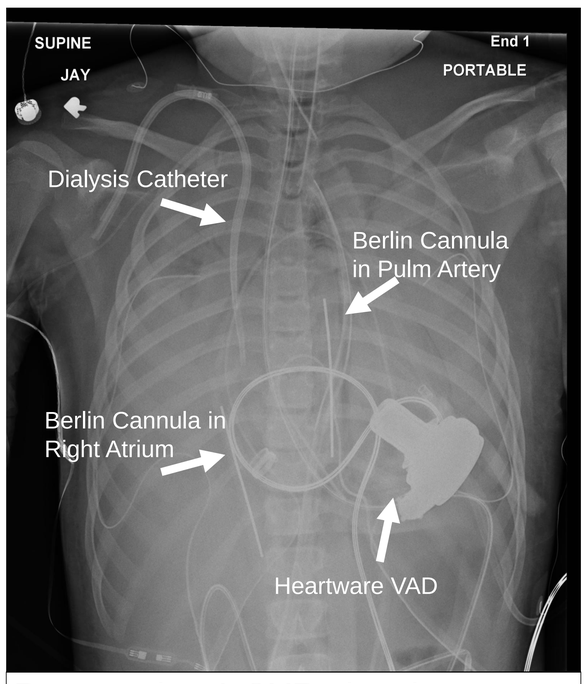
## BACKGROUND

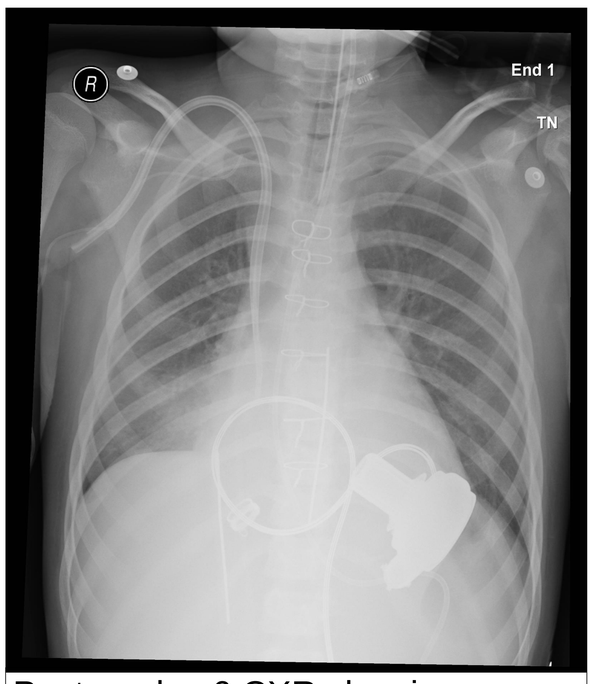
- Heparin induced thrombotic thrombocytopenia (HITT) complicates the care of patients requiring mechanical circulatory support due to concerns over increased stroke risk, device malfunction, and usage of alternative anticoagulants.
- We describe our experience with a complex patient requiring biventricular assist devices (BIVAD) as a bridge to heart-kidney transplant in the setting of HITT.

## CASE REPORT

- 11 y female (45 kg, BSA 1.47m$^2$) presented with dilated cardiomyopathy and acute on chronic renal failure secondary to reflux nephropathy (Cr 2.5 mg/dL, GFR 23.8 mL/min/1.73m$^2$).
- LV Ejection fraction 18% with moderate RV dysfunction.
- Cardiac catheterization PCWP 22, RAp 15 mmHg
- Supported on inotropes
- HITT positive before LVAD implantation




Post op day 1 CXR showing opacified lungs, surgical hardware, and dialysis catheter




Post op day 6 CXR showing improvement in lung fields, chest closure and removal of Quadrox oxygenator

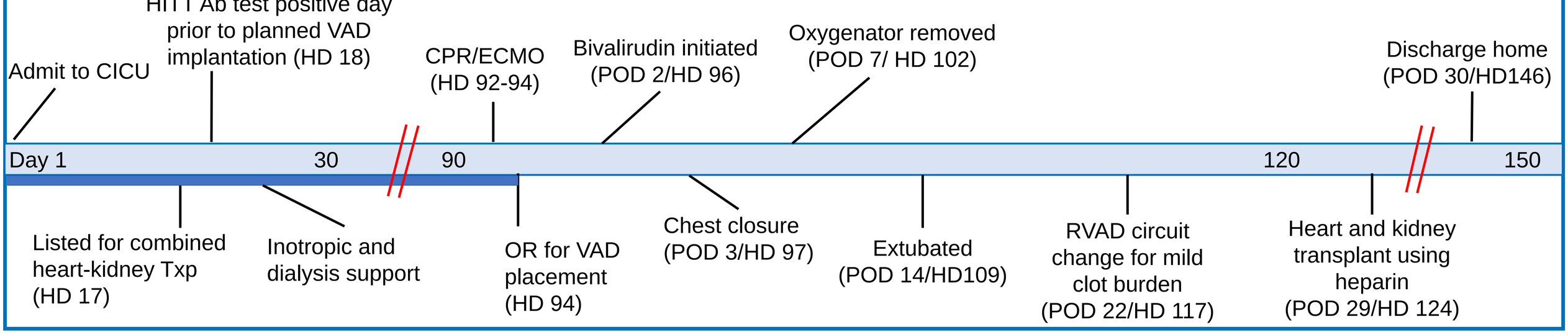
## OPERATIVE COURSE

Anticoagulated with bivalirudin and Softline coated, heparin-free tubing

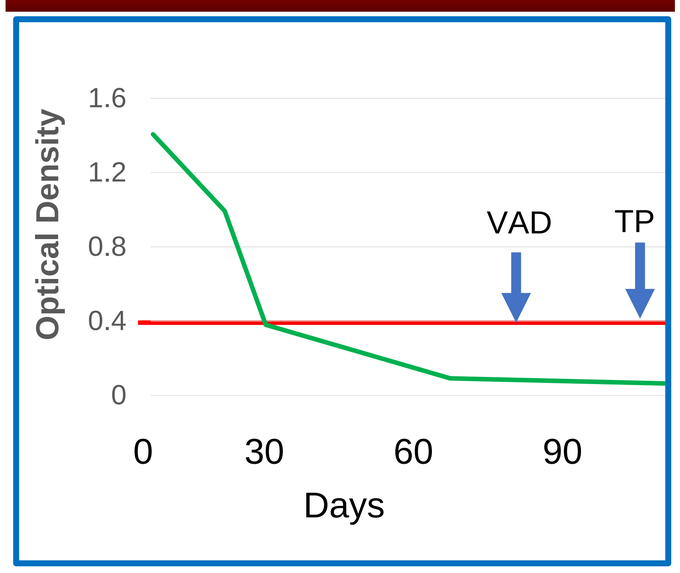
Heartware VAD placed in standard fashion

Right ventricle assist device
- Berlin Excor cannulas in right atrium and pulmonary artery
- Softline coated tubing and Rotaflow centrifugal pump
- Quadrox oxygenator with Softline coating spliced into Rotaflow circuit.

Severe coagulopathy requiring CRRT to clear the bivalirudin

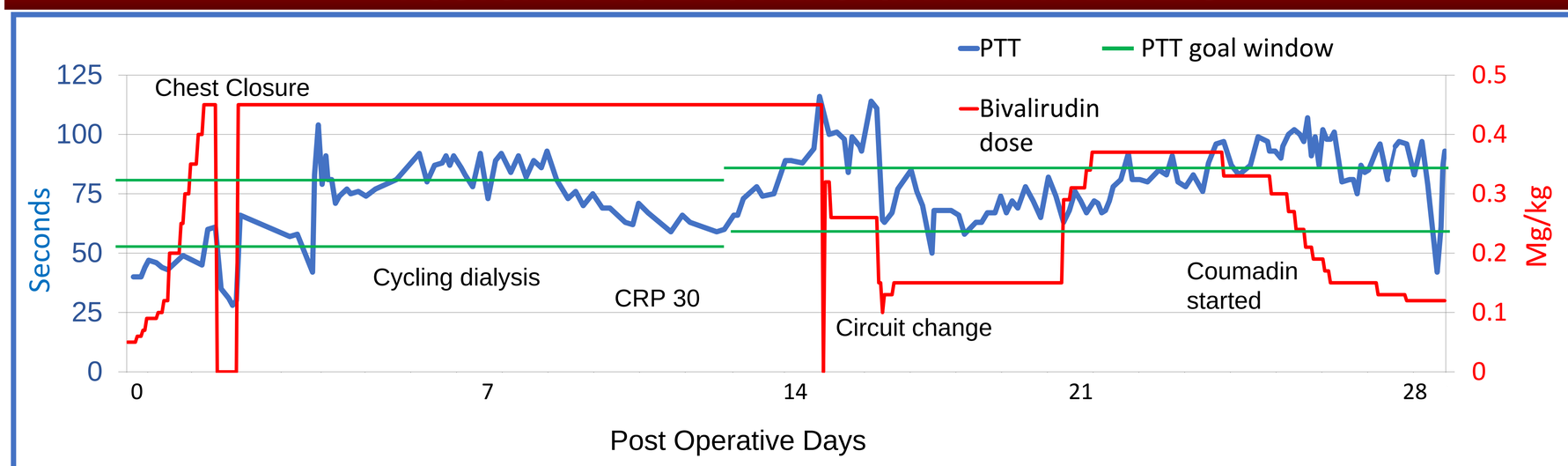



## HITT ANTIBODY LEVELS




HITT antibodies decreased over time. An optical density <0.399 is negative for HITT (indicated by red line). Heart transplant was performed using heparin TP=heart and kidney transplant

## POSTOPERATIVE BIVALRUDIN AND PTT LEVELS




Approximately 20% of bivalirudin is metabolized by the kidneys and also through CRRT. In this patient with renal impairment, there were changes in the partial thromboplastin time (PTT) corresponding with CRRT timing and duration. Pt was able to be managed with minimal adjustment in bivalirudin dosing with good therapeutic levels. There were no significant bleeding complications.

## CONCLUSIONS

- Anticoagulation with bivalirudin in a HITT positive patient facilitated bridging to a heart-kidney transplant on biventricular assist device and CRRT support with minimal thrombotic or bleeding complications.
- Strategies to decrease heparin exposure including use of bivalirudin, Softline coated oxygenator and tubing reduced HITT antibodies allowing safe and successful heart-kidney transplant on heparin

## Disclosures

- The authors have no disclosures
- Off label use of Rotaflow centrifugal pump, Bivalrudin, Berlin Excor Cannulas