



Complex Pediatric Hemodynamic Support Cases

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Acute HF in 10 yo boy

- Previously well 10 yo boy present to outside cardiologist 3 wks PTA with c/o:
 - fatigue
 - diaphoresis
 - Tachycardia
 - unintentional 10 lb weight loss
- Evaluation showed:
 - Structurally normal heart
 - Normal LV size and fxn
 - Frequent PVCs



Acute HF in 10 yo boy

- 3 weeks later, admitted to OSH with HF
- Repeat echo → severely diminished LV fxn (SF 6%)
- Started on Milrinone and transferred to Children's Medical Center for further care



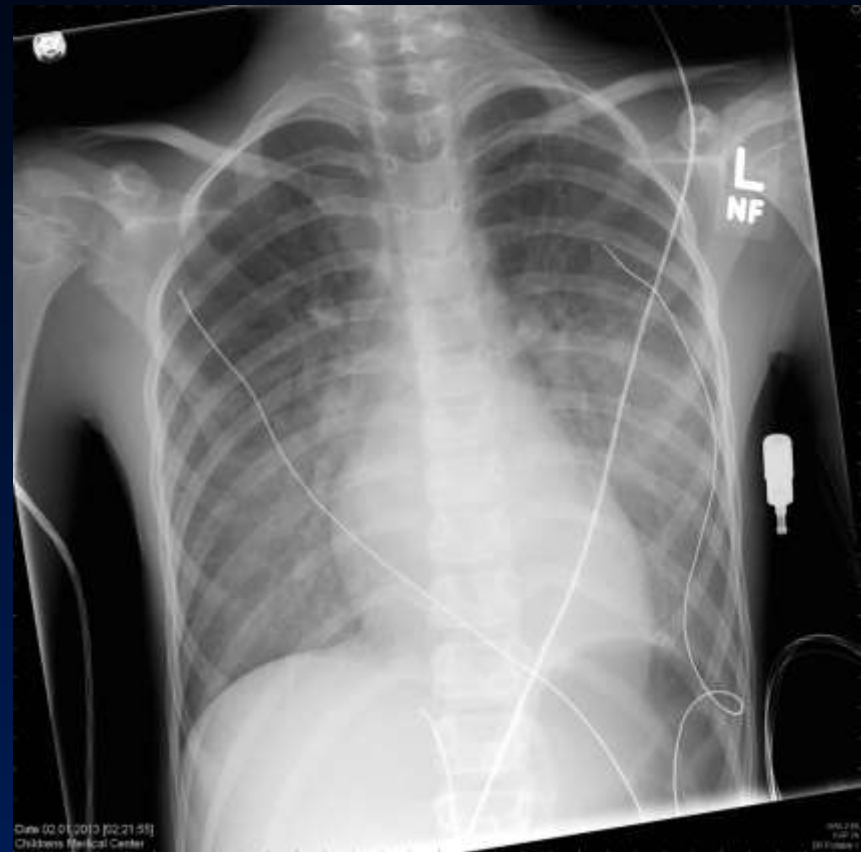
Acute HF in 10 yo boy

- Admission vitals:
 - AF, HR 170 bpm, BP 130/74 mmHg
- Admission labs:
 - NT Pro-BNP 27,619 pg/ml
 - CK-MB 5.7 ng/ml (ref < 4.0 ng/ml)
 - TropI 1.09 ng/ml (ref < 0.1 ng/ml)
 - LFTs, CBC, chemistry, BUN/Cr normal
 - Thyroid fxn consistent with sick euthyroid
- Admission echo:
 - EF 24% (SF 14%)



Acute HF in 10 yo boy

- Day 2 clinical status deteriorated
 - Placed on non-rebreather 10L/FiO₂ 0.95 w/sats in high 80's
 - NT Pro-BNP 49,000 pg/ml
- Consideration for mechanical support
 - *This requires transplant eval in pediatrics (if permanent)*
- Surgical work up included abdominal u/s:
 - right suprarenal mass





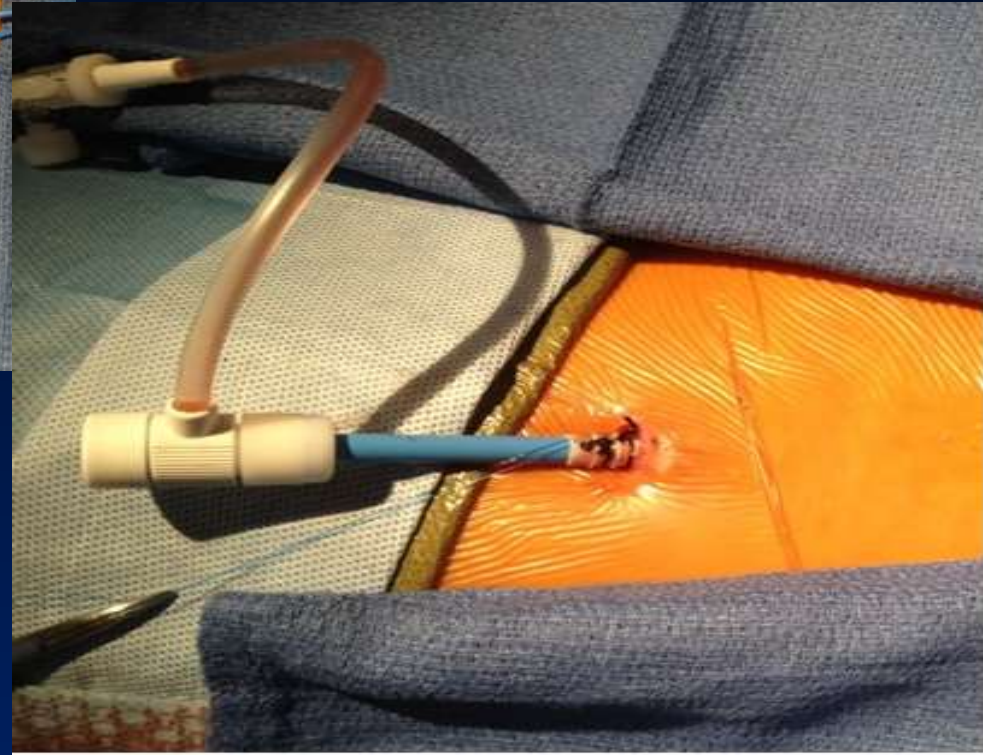
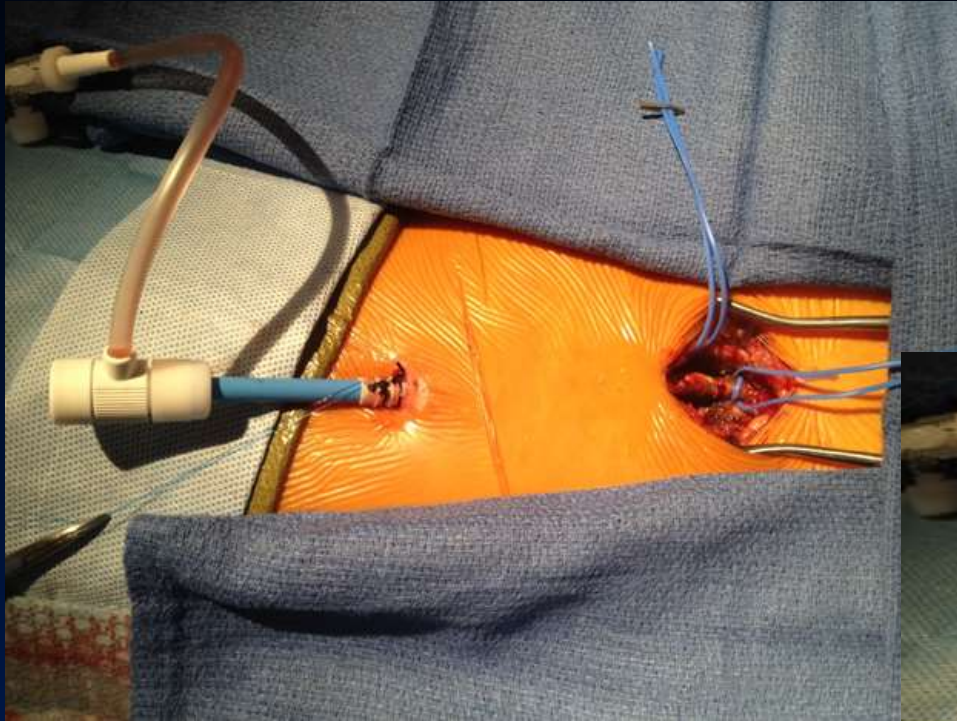


Acute HF in 10 yo boy

- Pheochromocytoma
- Needed open surgical resection...
 - Laparoscopic high risk due to impairment of venous return
- Impending circulatory collapse
- Decision made to support with Impella[®] 2.5
 - 21.7 kg, BSA 0.93 m²

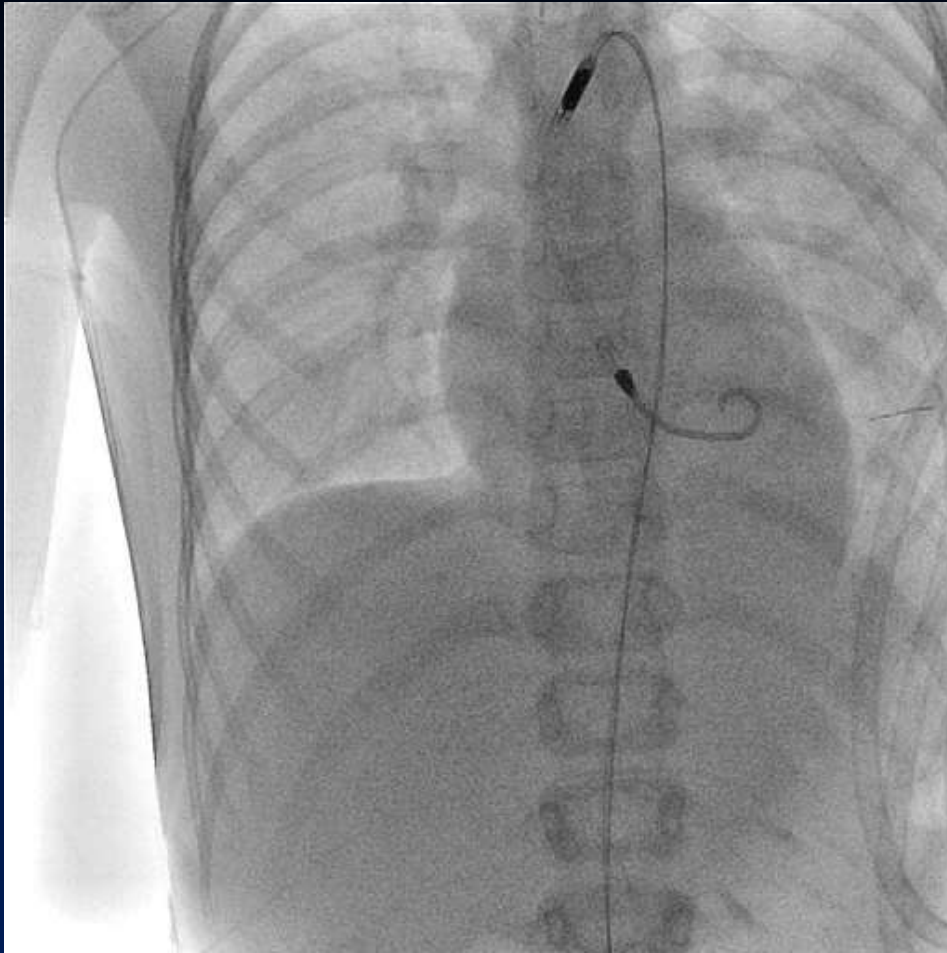


Impella® Placement





Impella® Placement





Acute HF in 10 yo boy

- NT Pro-BNP following morning 29,980 pg/ml
- Underwent successful open right adrenalectomy
- Intraoperative course uneventful:
 - Did not require alpha or beta blockade
- No post-operative hypotension
- No bleeding complications despite anticoagulation



Acute HF in 10 yo boy

- Supported for 2 more days
- Impella weaned and discontinued at bedside with fluoroscopic guidance
- Arteriotomy repaired at bedside



Acute HF in 10 yo boy

- Discharged home 11 days later on oral meds
 - Enalapril, Lasix
- Normal U/S interrogation of femoral vessel 6 mos post-Impella[®]
- Full recovery of fxn off medications by 6 mos





20 yo with CHD and palpitations

- 20 yo male with CHD (DORV/TGA/PA) s/p repair
- S/p dual chamber epicardial PM for advanced AVB
 - Chronotropic incompetence
- History of IART requiring multiple cardioversions
- Worsening ventricular function, low cardiac output (CI 1.5 L/min/m²)
- Diagnostic cath followed by EPS performed



20 yo with CHD and palpitations

- IART induced 1:1 AV conduction
- Degenerated rapidly to VF
 - 9 defibrillations
 - CPR x 8 min
 - Epi x 2, Lido x 2, Mg x 1, Amio x 1
 - ROSC following final defibrillation to junctional escape
- EPS aborted



20 yo with CHD and palpitations

- Needed upgraded PM and AICD
- Concern for cardiac manipulation and DFT testing due prior events
- Decision made to place Impella[®] CP as back up for temporary circulatory support



20 yo with CHD and palpitations

- Pocket opened and venous access achieved
- Impella[®] CP placed and patient fully heparinized
 - Flow at 0.9 L/min



20 yo with CHD and palpitations

- PM placement uneventful
- DFTs performed
- VF induced easily
 - Unable to terminate VF at 12 J internally x 3
 - External defibrillation at 200 J also not successful
 - Impella flow increased to 3.7 L/min with successful external defibrillation



20 yo with CHD and palpitations

- AICD reconfigured
- Attempts at inducing VF unsuccessful with Impella at 3.7 L/min
- Flow reduced again to 0.9 L/min
- VF induced with successful internal defibrillation at 25 J
- Impella removed and heparin reversed
- Extubated in cath lab



20 yo with CHD and palpitations

- Discharged home 2 days later
- Neurologically intact