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Case

- 6 month old male with hypoplastic left heart syndrome (HLHS) who underwent a bidirectional Glenn procedure
- Exhibited severe hypoxia with elevated transpulmonary gradient secondary to a large thrombus extending from the left internal jugular vein to the innominate vein.
- Underwent thrombectomy on CPB, and required VA ECMO for persistently elevated BDG pressures, hypoxia, and cardiogenic shock

Perioperative Events

- Required significant vasoactive support while on ECMO and developed multiorgan system failure
- After weaning from CPB there was minimal vasoconstrictor response to norepinephrine, vasopressin and hydrocortisone.
- Vasoplegia persisted until hydroxocobalamin (B12) was administered in three divided doses of 70mg/kg IV.
- Hemodynamics improved after B12 administration and vasoconstrictor requirement was significantly reduced.
- He eventually developed oliguric renal failure, hyperkalemia, and persistent multiorgan failure.

Anesthetic Record

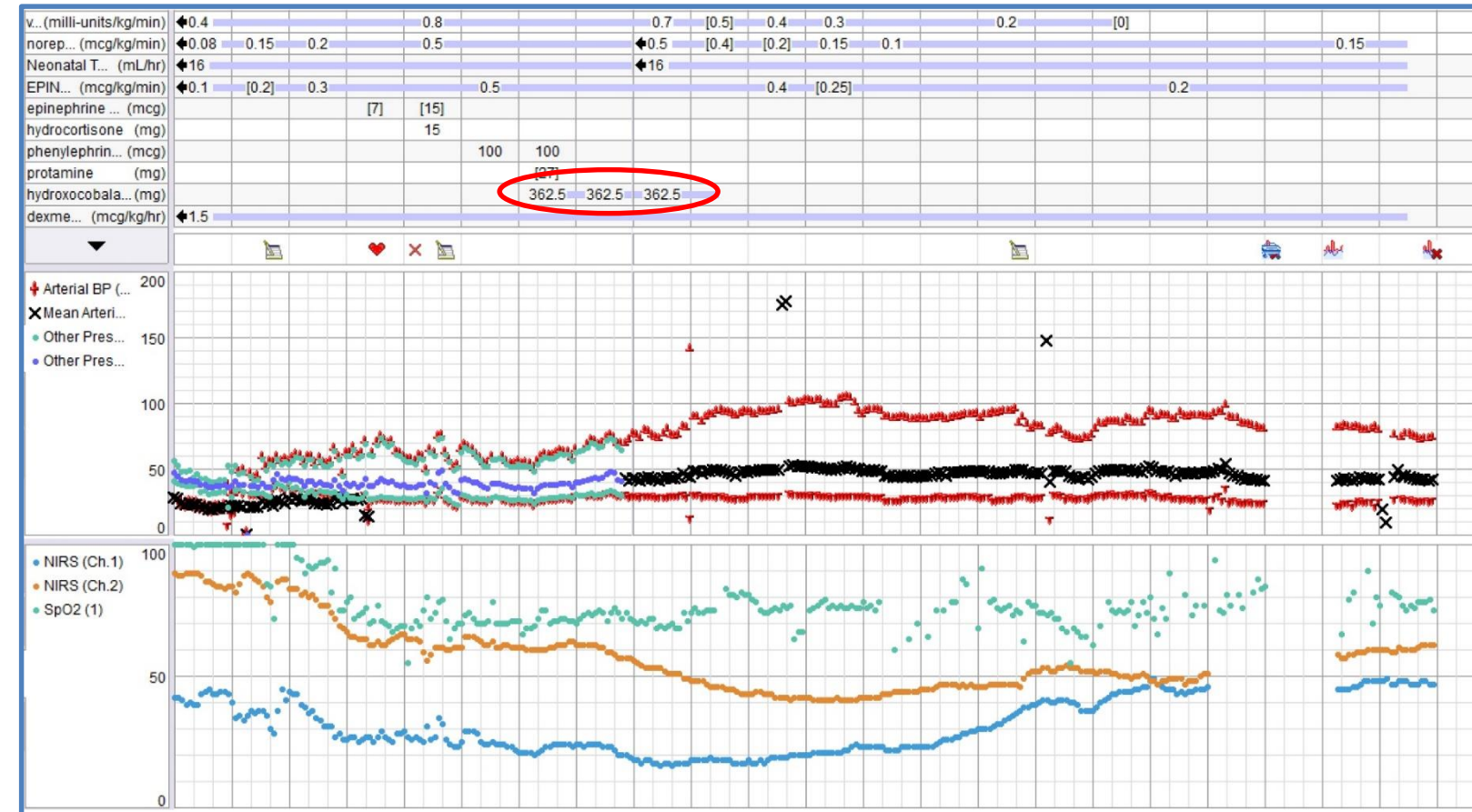


Table 1. Pre-B12 administration trends were consistent with distributive physiology. After B12 administration, vasoactive requirements decreased with evidence of increased SVR. As vasoconstrictor therapy was weaned, oxygen delivery based on non-invasive measures were improved.

Parameter	Pre-B12	30 min post B12	Post-op
MAP (mmHg)	31	48	41
CVP (mmHg)	20	20	15
SpO2 (%)	71	81	79
rSO2C (%)	23	17	45
rSO2S (%)	63	43	58
PetCO2 (torr)	38	43	56
PP (mmHg)	11	28	55
Da-vO2 (%)	8	38	21
VI	108	48	40

Discussion

- Vasoplegic syndrome incidence: 5% - 15%.
- Risk factors: ACE inhibition, beta blockade, long CPB.
- Etiology: multifactorial, related to a dysfunction of nitric oxide mediated vascular smooth muscle resistance.
- Treatment: alpha-agonists, vasopressin, and nitric oxide scavengers like methylene blue.
- Methylene blue: hemolytic anemia, serotonin syndrome, methemoglobinemia, and pulse oximetry interference.
- Vitamin B12: for cyanide poisoning (70mg/kg IV) → nontoxic cyanocobalamin, which is then excreted.
- Mechanism: nitric oxide and carbon monoxide scavenging.
- Side effects: hypertension, increased SVR, rash, erythema, dysphagia and chromaturia.
- Our patient: rash, chromaturia, and increased SVR
- VIS: evidence of increased SVR after administration of B12

Sources

1. Levin MA et al. Circulation 2009; 120:1664–71.
2. Roderique JD, et al. Ann Thorac Surg 2014;97: 1785–6.
3. Burnes ML, et al. J Cardiothorac Vasc Anesth 2017; 31:1012-1014
4. Gerth K, et al. Clin Toxicol (Phila) 2006; 44(Suppl 1):29–36