Infraclavicular Nerve Catheter for Treatment of Upper Extremity Vasospasm in a 5 Day Old

Introduction
- Neonatal limb ischemia is rare but increasingly reported, recent estimated incidence 1:4500 births/year
  - In utero-thrombosis, embolism, compression
  - Postnatal-usually related to umbilical or peripheral arterial catheters

Patient Presentation
- Full term male neonate, delivered vaginally with nuchal cord but otherwise uncomplicated, 4.4 kg
- Cyanotic distal right upper extremity noted at delivery, no pulses below elbow, see image 3
- Ultrasound: signs of thrombus in distal axillary artery

Treatment
- Heparin infusion started after delivery with no improvement in perfusion
- Day of birth-OR for revascularization via thrombectomy/embolectomy of right brachial artery
- 3 days old-return to OR for evacuation of hematoma, vasospasm of brachial and ulnar arteries not responsive to papaverine or 4% lidocaine injected intra-arterially, see image 4 and note pallor of fingertips
- 5 days old, infraclavicular nerve block/catheter placed with U/S using 20 gauge tuohy needle and 24 gauge catheter after heparin infusion held and PTT normal. See images 1 and 2
  - 1 ml bolus of 0.2% ropivacaine (0.45 mg/kg) administered with initial needle placement
  - Continuous infusion of 0.5 ml/h of 0.2% ropivacaine (0.23 mg/kg/h)

Outcome
- After nerve block/catheter infusion, distal right upper extremity doppler signals appreciated for first time, see image 5 and note improved fingertip perfusion
- Heparin infusion restarted 2 hours after block/catheter completion
- Peripheral nerve catheter (PNC) infusion continued for 48 hours. Heparin held, PTT normal for catheter removal
- Perfusion stable after catheter discontinuation. No complications related to block/catheter
- Preserved integrity of right upper extremity, see image 6, 2 month f/u visit

Discussion
- Peripheral nerve blockade induces peripheral vasodilation via sympathetic blockade and prevents vasoconstriction that is mediated by pain induced release of vasoconstrictive mediators
- One other report in literature of using PNC for limb ischemia in a small infant
  - 5 weeks old, 1.1 kg, preterm (EGA 28 weeks), with distal upper extremity ischemia after accidental arterial puncture
  - Axillary PNC, U/S guided, 19 gauge tuohy needle, 23 gauge catheter, 0.5 ml of 0.25% bupivacaine bolus (1.1 mg/kg), continuous infusion of 0.5 ml/h of 0.03% bupivacaine (0.14 mg/kg/h) for 36 hours

References