Ultrasound Guided Paravertebral Blocks for Pain Control after Thoracotomy in a Premature Infant

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Introduction: Regional techniques for pain control after thoracotomy provide superior analgesia, improve respiratory function and facilitate recovery when compared with intravenous opioids. Preexisting vertebral column abnormalities decrease the chance for successful placement of the thoracic epidural catheter via caudal approach. Ultrasound (US) guided paravertebral blocks (PVBs) have been shown to be an alternative to neuraxial anesthesia in pediatrics.

Case report: 3 day old, 2.4 kg infant born at 34 weeks screened for VACTREL syndrome (vertebral anomalies, ASD, tracheoesophageal fistula (TEF)). The patient underwent repair of esophageal atresia - TEF via right thoracotomy and remained intubated after surgery. Postoperatively, the patient was in moderate to severe pain (FLACC pain score 6-7) and required frequent administration of intravenous opioids. To facilitate extubation on POD#1, bedside US guided right PVBs were performed at T4-5 and T5-6 level (Fig.1). The patient was in left lateral position. The skin was prepped with chlorhexidine and anesthetized with J-TIP 1% Lidocaine. A longitudinal “out-of-plane” approach was chosen with 13-6MHz “hockey stick” US probe (Fig.2). After negative aspiration, a total of 3ml of 0.125% Bupivacaine with Epinephrine 1:200,000 was injected through 27G needle into the paravertebral space. Vital signs were stable during the procedure. The FLACC Pain Score was 0 for next 12 hours and patient did not required additional doses of narcotics.

Discussion: Medical literature contains scattered information about postoperative pain treatment in premature newborns. In this population, pain management after painful surgery like thoracotomy may be difficult. Preterm infants are prone to apnea after general anesthesia and often respond to narcotic medications with respiratory depression. Caudal epidural catheters are an excellent solution for continuous analgesia and improvement of respiratory function after thoracotomy, although advancing of the catheter to high thoracic levels may be challenging. This technique often requires C-arm and contrast use which is not harmless. Preterm infants diagnosed with vertebral abnormalities may not be appropriate candidates for caudal catheter placement. US guided PVBs are an effective and safe alternative to epidural catheters for prolong analgesia. US guided PVBs are easy to perform and can be repeated as needed in NICU setting.

Conclusion: US guided PVBs can be successfully used for postop pain control after thoracotomy in premature infants with vertebral column abnormalities

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