Letters to Editor

Continuous erector spinae plane block in pediatric patients with intraspinal tumors – Case reports

Dear Editor,

Ultrasound-guided regional techniques have revolutionized post-operative pain management (PPPM) in children.[1] PPPM in pediatric patients, unlike in adults, is challenging as most of the regional techniques need deep sedation.[1] The anticipation of pain and a plan for PPPM is necessary; and so is the need to plan alternative regional techniques. We share two cases in which ultrasound-guided continuous erector spinae plane (ESP) catheters were placed in view of disease spread in the neuraxial canal negating the use of traditional neuraxial blocks.

Case 1: A four-year-old female child weighing 11 kg, was diagnosed with a posterior mediastinal ganglioneuroblastoma and was planned for debulking surgery. On computed tomography scan, the intrathoracic paravertebral mass was scalloping the thoracic (D) 7 vertebra and the right 7th rib. In addition, there was an intraspinal extension from D4-5 to D7-8 levels and the adjacent extrathoracic region, refer Figure 1a. The child had undergone laminectomy four months prior and had received 2 cycles of etoposide and carboplatin chemotherapy. The patient underwent debulking surgery under general anesthesia with a posterolateral thoracotomy from the seventh intercostal space. In view of the intraspinal extension and apprehension of neurological damage, no neuraxial regional techniques were attempted. The patient was extubated in the post-anesthesia care unit (PACU) and oxygen was started at 10 liters/minute using high flow nasal cannula (HFNC) overnight. Parent-led patient-controlled analgesia (PCA) with fentanyl was started (7.5 ug bolus drug with a lockout interval of 15 minutes) along with syrup ibuprofen 100 mg and paracetamol 125 mg 8 hourly and the patient was shifted to the ward on the first postoperative day (POD). Chest physiotherapy was actively encouraged by the acute pain service team (APS) and physiotherapist. Overnight, the PCA attempt was 23 times with 14 deliveries. The worst pain scores recorded as per the Face, Legs, Activity, Cry, and Consolability (FLACC) scale was 4/10. Additional fentanyl boluses were administered by the team in accordance with the pain scores.

The child was readmitted in the intensive care unit (ICU) on POD 2 because of respiratory distress. After an initial trial with HFNC, the patient was sedated, intubated, and ventilated. The X-ray chest showed bilateral lung haziness

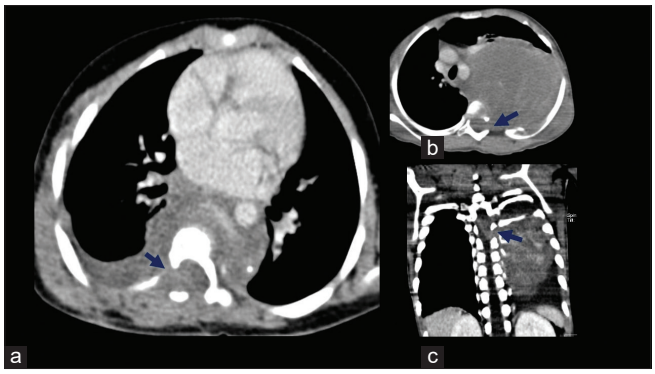

Figure 1: (a) Contrast-enhanced CT scan shows soft tissue density mass consistent with ganglioneuroma of the paraspinal region with intraspinal extension, in case 1 (shown by the arrow). (b and c) Contrast-enhanced CT of thorax with large heterogeneously enhancing mass arising from posterior mediastinum with the widening of the neural canal and intraspinal extension of the tumor (marked by arrows) at D6 vertebral level, in case 2

and the patient remained on the ventilator for the next 36 hours. On POD 4, extubation was planned in view of resolving consolidation on an X-ray chest. Due to the extension of disease in the extrathoracic soft tissue a local ultrasound of the back was performed for a fascial plane free of disease, Figure 2a. An 18 G catheter was placed under ultrasound guidance in the ESP at D8 level, under aseptic condition. The ultrasound probe 38x (13-6MHz) linear array transducer (M- Turbo Ultrasound system; Sonosite, Bothell, WA, USA) was placed parallel to the spine, and the Touhy needle (Epidural Minipack; Smith Medical, Portex, UK) was introduced using an 'in-plane' technique in the craniocaudal direction, Figure 2b. Informed consent of both the parents was taken before the procedure. The child received sedation for the procedure and was extubated subsequently. PPPM included local anesthetic (5cc of 0.25% bupivacaine) boluses through ESP catheter along with syrup paracetamol 125 mg 8 hourly. No additional doses of opioids were needed. On POD 8, the ESP catheter was removed under all aseptic precautions and the patient was discharged on POD 15. The patient is on routine follow-up for her primary disease.

Case 2: A 3-year-old female child, weighing 15 kg presented with ganglioneurobalstoma in the left posterior hemithorax. The patient had a rightward mediastinal shift, and the tumor had spread into the spinal canal at the D4-D7 level with cord compression, Figure 1b and c. The patient had received two cycles of etoposide and carboplatin prior to surgery. Clinically, the patient had bilateral lower limb weakness. Tumor excision was planned under general anesthesia. Due to intraspinal extension of tumor, epidural analgesia was not attempted. Intraoperatively, patient lost 550 ml of blood, which was replaced with fluids and blood. A low dose noradrenaline infusion was started and the

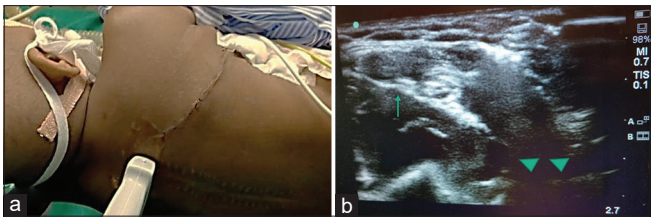

Figure 2: (a) Scout scan being performed to identify the plane which is free of disease, in case 1. Note also the thoracic incision. (b) Dissection of the erector spinae plane (ESP) prior to the insertion of the catheter. Arrow point to the needle in situ/arrowheads showing drug spread in the ESP plane

patient was sedated and electively shifted in the ICU on the ventilator. After consent from the parents, the ESP catheter was placed at the D5 level under ultrasound guidance. Levobupivacaine (6cc 0.25%) was given through the catheter. The patient was extubated in a few hours. PPPM included ESP catheter bolus of 6cc of 0.25% levobupivacaine 8 hourly along with syrup paracetamol 200 mg 8 hourly. Pain, as measured by FLACC scale, was mild. ESP catheter was removed on POD 4.

Pain management is crucial following open thoracic surgeries in pediatric patients and inadequate pain relief can lead to respiratory complications.[2] In both the cases, epidural analgesia or paravertebral block was not attempted in view of extensive neural involvement. Traditionally, all our patients in whom epidural analgesia cannot be placed, parent/patient-led PCA is offered as we did in case 1. Although PCA is a suitable alternative, continuous regional techniques provide superior analgesia.[3] Readmission of the child back to ICU demanded a relook into the pain management.

There is growing evidence for the use of ESP blocks and continuous catheters in children.[2,4,5] In the ESP block, the drug is deposited in the fascial plane deep to the erector spinae muscle and superficial to the tip of the transverse process with extensive multidermatomal coverage.[6] In case 1, there was a concern of dissecting through tumor tissue. The approach and relation with surgical incision were deliberated with our radiology colleague. The decision of catheter placement in the ICU was executed following a comprehensive discussion with the surgical and radiology colleagues, which helped in imparting a favorable outcome in this case. Whether an upfront ESP block at the end of the surgery, could have prevented the pulmonary complication, in this case, is debatable. However, subsequently, similar patients, including case 2 have got the benefit of this block in the immediate postoperative period, with encouraging results.

In conclusion, continuous erect spinae block should be considered following thoracic surgery in pediatric patients with intraspinal disease spread.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the guardian(s)/patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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