Ultrasound guided erector spinae plane block – An effective rescue analgesia for pediatric open upper abdominal surgery

Dear Editor,

The erector spinae plane block (ESPB), since its initial description in 2016,[1] has also been described as a modality for intraoperative and postoperative analgesia in thoracoscopic, laparoscopic, and open thoracoabdominal surgeries in pediatric patients.[2] We would like to report the use of ESPB as a rescue analgesic, in a 4-year-old male child weighing 15 kg, who underwent right sided adrenalectomy for a functioning adrenocortical tumor. Written informed consent was obtained from the parent for the purpose of publication.

The surgical plan was robotic-assisted laparoscopic adrenalectomy. Our analgesic plan included intravenous fentanyl, paracetamol, and ketorolac. After 5 h of surgery, surgeons planned to open the abdomen due to difficult dissection and bleeding, with a subcostal incision extending from T7 to T10 on the right side. Intraoperative surgical response was managed with IV fentanyl (total dose of 45 mcg). A single-shot right sided ESPB was performed for postoperative analgesia at the end of surgery. In the same left lateral position, after aseptic precautions, a high frequency linear transducer probe (6 to 15 MHz SonoSite S series; Bothell, WA, USA) was placed in longitudinal para-sagittal direction 2 cm lateral and parallel to the T7 to T10 spinous process marked [Figure 1a]. The probe was moved laterally to visualize the tip of transverse process T9 [Figure 1b]. A 5 cm 20 G needle was inserted in-plane, caudal-cranial direction, to reach below erector spinae muscle (ESM). After negative aspiration, 1 ml of normal saline was injected to confirm the spread of saline. Once cranio-caudal spread was confirmed, 10 ml of 0.25% bupivacaine (0.5 ml/kg) was deposited below the ESM sheath [Figure 1c]. Following the block, infiltration with local anesthetic (4 ml of 0.25% bupivacaine) was done at the laparoscopic port sites before extubation. Later the child was extubated and shifted to pediatric intensive care unit (PICU). In PICU, child had stable vital signs with no tachycardia, respiratory rate 15/min, alert and comfortable with FLACC (Face, Legs, Activity, Cry, Consolability) scale of 0. No rescue analgesic (IV fentanyl) was used for 24 h postoperatively. Paracetamol (IV) 10 mg/kg was administered every 6 h for 48 h. No side effects of the block were reported.

In the ESPB, the drug is deposited deep to the ESM sheath and superficial to transverse process, as close as possible to the origin of the dorsal rami of the spinal nerves in the targeted dermatomes and a cephalocaudal distribution of drug is expected.[1] We chose ESPB as a rescue analgesic technique rather than caudal anesthesia to avoid bilateral sensory block, urinary retention, and early ambulation.[3] Lower thoracic epidural can be a better alternative, but it has been reported with unrecognized dural taps, multiple attempts, total spinal anesthesia, and nerve injuries in pediatric population.[4] Our experience with this patient emphasizes the utility of the ESPB as a rescue analgesic modality during unplanned conversion from minimally invasive surgical approach to an open surgical approach.

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Conflicts of interest
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Figure 1: (a) Patient in left lateral position, probe oriented in sagittal direction over the marked spinous process from T7 to T10. In-plane insertion of needle from caudal direction. (b) Para-sagittal ultrasonographic visualization of flat hyperechoic transverse process from T7 to T10. (c) Needle tip above the T9 transverse process. Local anesthetic drug lifting up ESM with cranio-cephalad spread from T7 to T10
Dear Editor,

A 16-year-old patient, with history of refractory status epilepticus, was admitted to our ICU for control of seizures and elective mechanical ventilation. Anticipating prolonged mechanical ventilation, Griggs technique of PDT under bronchoscopic guidance was planned. After adequate muscle relaxation and analgesia, bronchoscope of size 5.5 (Olympus medical systems, Tokyo, Japan) was inserted through the 7.0 mm ID percutaneous dilatational tracheostomy kit (Smiths Medical, Minneapolis, Minnesota) was introduced into the trachea under direct bronchoscopic vision. Metal guidewire introducer needle with a plastic sheath of the PORTEX GRIGGS® was threaded into the trachea through the plastic sheath, which was then removed. The Griggs guidewire dilating forceps was introduced through the metal guidewire, which was missed on the immediate post PDT supine CXR and pneumothorax occurring simultaneously in a patient and pneumothorax and tracheoesophageal fistula following percutaneous dilatational tracheostomy (PDT). This report highlights the hazards of a procedure that is conducted worldwide and considered safe.

We report a case of refractory status epilepticus who developed bilateral pneumothorax and tracheoesophageal fistula following PDT. Esophagoscopy revealed a 4 cm long linear tear in the posterior tracheal wall with free communication between the esophagus and trachea [Figure 3]. An esophageal stent placement was done till trachea could be palpated.

An esophageal stent was placed, and the patient was continued on tracheostomy ventilation. Anticipating the development of aspiration pneumonia, 2 hourly cuff deflation was undertaken. However, on day 4 of PDT, gastric contents were noted in TT, followed by a significant increase in peak airway pressures, decrease in PaO2/FiO2 ratio. Chest X‑ray (CXR) revealed features of aspiration and bronchoscopy confirmed position of tracheostomy tube. Therafter, the oxygen requirement and peak airway pressures increased. Urgent bedside chest X‑ray and ultrasound revealed a right pneumothorax. An intercostal drain was inserted and ventilatory parameters improved. Appropriate bronchoscopic view was completely obliterated by the bleed from the tracheal mucosa. As a stoma had been formed, a rigid bronchoscope was introduced through the tracheostomy and forceps was introduced through the metal guidewire and the trachea was dilated in two perpendicular directions. During the dilatation, bleeding into the trachea was encountered. The bleeding was controlled using metal wall suction and during the dilatation, bleeding into the trachea was encountered. The bleeding was controlled using metal wall suction and then the dilatation was completed. The Griggs guidewire dilating forceps was introduced through the metal guidewire and the trachea was dilated in two perpendicular directions. During dilation, bleeding into the trachea was encountered. The bleeding was controlled using metal wall suction and then the dilatation was completed.

The completion of dilatation led to an immediate decrease in peak airway pressures and oxygen requirement. The patient was continued on tracheostomy ventilation for 4 days and subsequently, the cuff pressure was decreased to 10 cmH2O. As bronchoscopic view was visible through the tracheal stoma, the stenosis was treated with dilatation forceps, a rigid bronchoscope was introduced through the tracheostomy and forceps was introduced through the metal guidewire and the trachea was dilated in two perpendicular directions. During dilation, bleeding into the trachea was encountered. The bleeding was controlled using metal wall suction and then the dilatation was completed. The completion of dilatation led to an immediate decrease in peak airway pressures and oxygen requirement. The patient was continued on tracheostomy ventilation for 4 days and subsequently, the cuff pressure was decreased to 10 cmH2O. As bronchoscopic view was visible through the tracheal stoma, the stenosis was treated with dilatation forceps, a rigid bronchoscope was introduced through the tracheostomy and forceps was introduced through the metal guidewire and the trachea was dilated in two perpendicular directions. During dilation, bleeding into the trachea was encountered. The bleeding was controlled using metal wall suction and then the dilatation was completed. The completion of dilatation led to an immediate decrease in peak airway pressures and oxygen requirement. The patient was continued on tracheostomy ventilation for 4 days and subsequently, the cuff pressure was decreased to 10 cmH2O. As bronchoscopic view was visible through the tracheal stoma, the stenosis was treated with dilatation forceps, a rigid bronchoscope was introduced through the tracheostomy and forceps was introduced through the metal guidewire and the trachea was dilated in two perpendicular directions. During dilation, bleeding into the trachea was encountered. The bleeding was controlled using metal wall suction and then the dilatation was completed. The completion of dilatation led to an immediate decrease in peak airway pressures and oxygen requirement. The patient was continued on tracheostomy ventilation for 4 days and subsequently, the cuff pressure was decreased to 10 cmH2O. As bronchoscopic view was visible through the tracheal stoma, the stenosis was treated with dilatation forceps, a rigid bronchoscope was introduced through the tracheostomy and forceps was introduced through the metal guidewire and the trachea was dilated in two perpendicular directions. During dilation, bleeding into the trachea was encountered. The bleeding was controlled using metal wall suction and then the dilatation was completed. The completion of dilatation led to an immediate decrease in peak airway pressures and oxygen requirement.

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It is important to emphasize the importance of proper training and supervision during the performance of PDT, as complications can be severe, and the procedure should be performed only by experienced personnel. Our patient had a good outcome and was discharged from the ICU after 10 days of mechanical ventilation. However, the patient had a prolonged course of mechanical ventilation due to the complications of tracheoesophageal fistula and bilateral pneumothorax.

In conclusion, PDT is a safe and effective procedure for the management of difficult intubation, but it carries a risk of complications, and proper training and supervision are essential. We strongly recommend that PDT should only be performed by experienced personnel, and the patients should be monitored closely during and after the procedure. This case highlights the importance of proper training and supervision during the performance of PDT, and the potential complications that can arise if proper precautions are not taken.