

Erector spinae plane block in the pediatric population: a case series

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Abstract: The erector spinae plane block (ESPB) is a novel locoregional block where local anesthetic is injected between the erector spinae muscle and the underlying transverse process. Due to the novelty of this technique, only few reports of ESPB in the pediatric population currently exist. We report three pediatric patients who successfully received a (continuous) ESPB for peri- and postoperative pain during thoracoscopy and -tomy. The block itself is easy to learn and has fewer complications than a thoracic epidural catheter. A randomized controlled trial is needed to verify our findings.

Keywords: Erector spinae plane block; paravertebral block; pediatric population.

INTRODUCTION

The erector spinae plane block (ESPB) is a novel locoregional block, firstly described in adults, where local anesthetic is injected between the erector spinae muscle and the underlying transverse process (Fig. 1). Its advantage over a thoracic epidural catheter or a paravertebral block is the reduction in severe complications, with a non-inferiority regarding analgesia (1). Since the introduction of ultrasound techniques, pediatric regional anesthesia has been gaining popularity (2). Due to the novelty of this technique, only few reports of ESPB in the pediatric population currently exist. At the moment we first applied this block there was a report of a single shot ESP-block in a 3-year-old child and another one of a continuous ESP-block in a 3-year-old child (3, 4). We report three younger pediatric patients who successfully received an ESP-block for peri- and postoperative pain during thoracoscopy and -tomy.

CASE SERIES

The first patient was a 2-year-old, 10 kg female, who underwent a thoracotomy for necrosectomy of a complicated pneumonia. The patient was extubated after surgery. A continuous ESP-block was performed, with injection of 5 ml of ropivacaine 0.375% and a further 6 ml of ropivacaine 0.2%

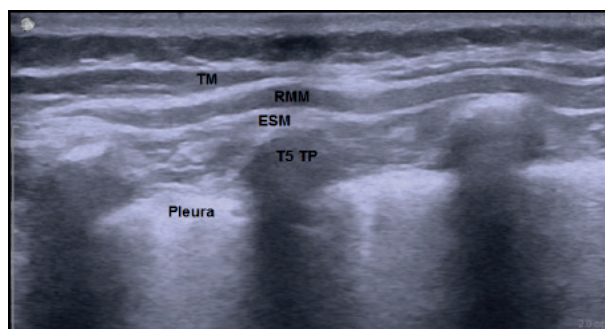


Fig. 1. — Ultrasound image of the anatomic landmarks of an ESPB of a 2-year-old, 10 kg female (ESM, erector spinae muscle; LA, local anesthetic; RMM, rhomboid major muscle; TM, trapezius muscle; TP, transverse process).

through the catheter. A 20 Gauge needle was used to advance the catheter. The anatomical landmarks were visualized without difficulty, with clear echographic images of the the different layers of muscles, transverse processi, paravertebral space and pleura (Fig. 1). Unfortunately, the catheter got dislocated from the pump during transportation of the patient, and was removed as sterility could no longer be confirmed. Nevertheless, the patient was comfortable without signs of pain during the first 16 hours postoperatively. Since this patient wasn't included in a study, the standard pain therapy was started upon arrival at the pediatricintensive care. The patient received a low dose morphine drip that could be adjusted at any time.

The second patient was a 3-year-old, 15 kg male, who underwent a thoracoscopic decortication

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for a complicated pneumonia. The patient was successfully extubated after surgery. A single shot ESPB was preferred because of the minimal invasive and unilateral surgery. An ESPB was placed using 8 ml of ropivacaine 0.375%. The patient was comfortable during the first 12 hours after surgery. This patient also received a low dose morphine drip that was adjustable to clinical needs.

Our third and last patient was a 6-month-old, 6 kg female who developed an RSV bronchiolitis with hyperinflation syndrome, for which she underwent a thorascopic lobectomy. A single shot ESPB was preferred rather than a continuous block as the patient was very small. The dosing consisted of 4 ml of ropivacaine 0.375%. The patient was comfortable up to 16 hours after the surgery, without side effects. A standard morphine drip was started upon arrival at the PICU.

DISCUSSION

We successfully performed the ESP-block in three pediatric patients. Our findings extend the data of previous reports, namely that the ESP-block seems to be a safe, relatively easy and effective method of perioperative analgesia during thoracic surgery in smaller children. Our first goal was to see whether or not it was technically possible to perform an ESP-block in smaller children. During the placement of a catheter we noted that a correctly placed 20G needle opening is too big to prevent some spilling of the fluid into the muscle. A good alternative is the use of a smaller needle to inject the local anesthetics between the erector spinae muscle and the processi transversi to separate these structures correctly. Afterwards we place a bigger needle to advance the catheter.

Since these patients weren't included in a study, the postoperative pain scores and postoperative multimodal analgesia weren't strictly monitored or standardized. So we weren't able to allocate the effect of the block versus the standardized multimodal analgesia, nor find the perfect volume/concentration for this block. We believe that this (continuous) block has the potential to be widely adopted in smaller children in the future, thus replacing the thoracic epidural catheter. The complication risk seems to be minimal when compared to the thoracic epidural catheter. Prospective studies comparing the (continuous) ESP-block with current standard analgesic techniques are needed to validate our findings.

LEARNING POINTS

An ESPB can safely be used in children weighing less than 7 kg.

A ESPB-catheter can safely be placed in children weighing 10 kg.

A concentration of 2mg/ml ropivacaine can safely be used in children weighing less than 7 kg.

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