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Erector Spinae Plane Block for Different Abdominal Surgeries: Case Series

Mouad Lagdani*, Youssef Elouardi, Mohamed Khallouki

Department of Anesthesia and Intensive Care Medicine, Ibn Tofail Hospital, Mohammed VI University Hospital Center, Marrakech, Morocco

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***Corresponding author:** Mouad lagdani

Abstract **Case Report**

The ultrasound guided erector spinae plane (ESP) block is a recent block described for various surgeries for postoperative analgesia. ESP block has effect on both visceral and somatic pain; therefore, its use in laparoscopic cholecystectomy and other abdominal surgeries can be advantageous. The technique is considered a quality standard because it provides good control of the anticipated pain. The local anesthetic is injected between the erector spinae muscle and the transverse process and it spreads cranially and caudally into the paravertebral space, affecting the ventral and dorsal branches of the thoracic spinal nerves and the rami communicants that contain sympathetic nerve fibers. This relatively simple and safe block dramatically reduced the amount of IV pain medication we usually administer for the specific procedure. The overall result was increased satisfaction of the patient and avoidance of opioid use. We described five case series of ESP blocks successfully performed for postoperative analgesia in various abdominal surgeries.

Keywords: Abdominal surgery; erector spinae plane block; analgesia.

INTRODUCTION

Ultrasound guided erector spinae (ESP) block is a regional anesthesia technique, recently described by Forero *et al*. [1] for use in thoracic neuropathic pain. The block is initiated by injecting anaesthetic in the plane between the erector spinae muscle and the transverse process, with its effect seemingly due in part to diffusion of the local anaesthetic into the paravertebral space through spaces between adjacent vertebrae. The anaesthetic then acts on both the dorsal and ventral branches of the thoracic spinal nerves [2]. The ESP block is performed under ultrasonographic guidance. ESP block provides visceral and somatic analgesia for abdominal surgery [3] and can be a useful alternative to the epidural anesthesia in major abdominal surgery. Herein we report five patients undergoing multiple abdominal procedures in a single surgical session in which ESP was successfully performed for postoperative analgesia.

CASES REPORTS

Case 1

A 56-year-old male patient (weight 90 kg, height 180 cm) was scheduled for open surgery of supraumbilical and inguinal hernia repair from the right side. Bilateral ESP block was performed before the induction to general anesthesia, at Th10 level with 20 mL 0.25% bupivacaine from both sides. Anesthesia was induced with fentanyl 2 µg/kg, propofol 2 mg/kg, and rocuronium bromide 0.6 mg/kg and were same in all patients. It was maintained with sevoflurane (MAC 0.7–1) and additional bolus doses of fentanyl. The total amount of fentanyl was 350 µg. Visual analog scale (VAS) score 2 h after surgery was 1 at rest and 2 on coughing. After surgery, at 6, 12, and 24 h, the pain was 2 at rest and 3 on coughing, thus, 1 g paracetamol was given. 19 h after surgery pain was 5/10 and 100 mg tramadol was given. After 36 and 48 h, the pain was 2 at rest and on coughing, and after 72 h was 1 at rest and on coughing.

Case 2

A 48-year-old male patient (weight 84 kg, height 186 cm) was scheduled for an ileostomy reversal surgery. ESP block was performed from the left side at the Th8 level with 20 mL 0.25% bupivacaine. The total amount of given fentanyl was 400 µg. After the operation, the patient complained of having pain 3/10 and 1 g paracetamol was given. 2 h after operation, the pain was 2 at rest and on coughing. After 6 h, the pain was 3/10 at rest and on coughing, but after 12 h he received 100 mg tramadol (the pain was 4 at rest and on coughing). After 24 h, the pain was 3/10 at rest and 4/10 on coughing, thus, 1 g paracetamol was given, and after 36 h, the pain was 2/10 at rest and on coughing.

Pain scores 2/10 at rest and 3/10 on coughing were reported after 48 and 72 h, respectively and 1 g paracetamol was given.

Case 3

A 67-year-old male patient (weight 70 kg, height 165 cm) was scheduled for open diaphragmatic hernia repair. A bilateral ESP block was performed at the Th8 level. The total amount of fentanyl was 350 µg. 2 h after surgery, patient-reported pain 3/10 at rest and 4/10 on coughing, thus, 1 g paracetamol was given. Pain scores 6, 24, 48, and 72 h after the surgery were the same, 3/10 at rest and on coughing, thus, 1 g paracetamol was given. 12 and 36 h after surgery, patient-reported pain 2/10 at rest and 3/10 on coughing.

Case 4

A 65-year-old female (weight 80 kg, height 166 cm) was scheduled for laparoscopic cholecystectomy. The total amount of fentanyl given was 350 µg. 2 h after surgery, the patient-reported pain 3/10 at rest and 5/10 on coughing, and thus, 1 g paracetamol was given. After 4, 8, and 12 h, the pain was 3/10 at rest and on coughing and 1 g paracetamol was given. 24 h after surgery, the pain was 1/10 at rest and 2/10 on coughing and no analgesic was given.

Case 5

A 54-year-old male patient (weight 90 kg, height 177 cm) was scheduled for surgery of right colectomy for colon cancer. Bilateral ESP block was performed at the Th10 level with 30 mL 0.25% bupivacaine on each side before surgery. The total amount of fentanyl given during surgery was 250 µg. 2 h after surgery, the patient-reported pain 4/10 at rest and 5/10 on coughing, and thus, 1 g paracetamol was given. After 4, 8, and 12 h, the pain was 4/10 at rest and on coughing and 100mg tramadol was given. 24 h after surgery, the pain was 3/10 at rest and 5/10 on coughing and 1g paracetamol was given. No nausea or vomiting was observed in all patients.

DISSCUTION

The first publications addressing this novel block focussed on thoracic analgesia [4]. They described its use as treatment for thoracic neuropathic pain, costal fractures, thoracic vertebral surgery, breast surgery and thoracic surgery in one child in whom the blockade was performed at the end of the surgical intervention, with the patient still anaesthetised[5].

ESP block is performed by injecting anaesthetic under the erector spinae muscle and into the inter-fascial plane between this muscle and the transverse processes. Its effect seems to be due in part to diffusion of the local anaesthetic into the paravertebral space through the non-osseous spaces between adjacent vertebrae, which then acts on both the dorsal and ventral branches of the thoracic spinal nerves, as well as the communicating branches that feed the sympathetic chain.It thus has an effect profile similar to that of retrolaminar and paravertebral blocks [5]. The blocks can be performed under real-time ultrasonographic guidance to visualize adequate spread of local anaesthetic within the plane and reduce risk of complications. Catheter placement allows the prolongation of analgesic effects to the post-operative period [6].

ESP block provides effective analgesia in the intra- and the postoperative period after abdominal surgeries. Pain during abdominal surgery consists of somatic and visceral pain. [7] Somatic pain contains 70–75% of the pain, lasts 72 h after open surgery and is arising from the anterior abdominal wall. Visceral pain lasts for 24–36 h, it is intense but short-term. Opioids are very effective in the treatment of visceral pain but not so effective for somatic pain and are related to side effects in the postoperative period [8]. Chin *et al*. reported that the ESP block is able to provide visceral analgesia in patients undergoing ventral hernia repair [6]. However other authors have found that while ESP blocks provide effective somatic analgesia and have definite opioid sparing effect following abdominal surgery, its visceral analgesia effects may be less efficacious [6].

In patient 1, the most often pain score was 5. In patient 2, the most reported pain score in the first 72 h was 4/10. In patient 3, the most reported pain score was 4. In patient 4 the most often pain score wase 4, which shows the opioid-sparing effect of ESP block.

The complications of ESP block are pneumothorax, motor malfunction, systemic toxicity of local anesthesia (LAST), and priapism [9]. None of our patients reported a complication of the block. the ESP block showed a significant analgesic effect during various abdominal surgeries in the postoperative period, with less opioid consumption during surgery and lower pain scores in the 72 postoperative hours.

CONCLUSION

The technique of EPS is considered a quality standard because it provides good control of the anticipated pain this case series has demonstrated that ESP block can be successfully used in lower and upper abdominal surgical procedures, especially if these procedures are performed in the same session.

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