Clinical case

doi: 10.35366/102905

Revista Mexicana de Anestesiología
January-March 2022
Vol. 45. No. 1. pp 65-67

Continuous erector spinae block for postoperative analgesia in a partial colectomy by subcostal incision

Bloqueo continuo de los erectores espinales para la analgesia postoperatoria en una colectomía parcial por incisión subcostal

David Alexandre Correia-Coelho, M.D.,* Filipe Pinheiro, M.D.,‡ Ana Gaspar, M.D.*

How to cite: Correia-Coelho DA, Pinheiro F, Gaspar A. Continuous erector spinae block for postoperative analgesia in a partial colectomy by subcostal incision. Rev Mex Anestesiol. 2022; 45 (1): 65-67. https://dx.doi.org/10.35366/102905

ABSTRACT. Erector spinae plane block is an ultrasound-guided technique who has seen a growing role as a perioperative analgesic technique due to its safety profile and versatility. We describe a case of an elderly female with a history of ischemic heart disease and atrial fibrillation, who underwent segmental colectomy by left subcostal laparotomy under general anesthesia, for removal of a colon tumor. An erector spinae plane catheter was placed at the T7 level under ultrasound guidance, and then used for postoperative analgesia. Ropivacaine 0.2% (initial bolus + infusion at 8 mL/h) was used through the catheter, together with intravenous paracetamol and metamizol. This analgesic regimen was maintained for 72 hours, with excellent pain control, after which the catheter was removed. The patient's pain remained controlled and rescue analgesia was not required until her discharge at seven days postoperative. Continuous ESP block was an effective technique for postoperative analgesia in this case, allowing excellent pain control with a low risk of complications and avoiding the use of opioids.

RESUMEN. *El bloqueo del plano del músculo erector espinal es una técnica ecoguiada que ha ganado popularidad como técnica analgésica perioperatoria debido a su perfil de seguridad y versatilidad. Se describe el caso de una anciana con cardiopatía isquémica y fibrilación auricular, a la que se le realizó colectomía segmentaria mediante laparotomía subcostal izquierda bajo anestesia general, para la escisión de un tumor de colon. Se colocó un catéter en el plano del músculo erector espinal al nivel T7 bajo guía ultrasónica y luego se utilizó para analgesia postoperatoria (ropivacaína 0.2% bolo + infusión a 8 mL/h) junto con paracetamol intravenoso y metamizol. Este régimen analgésico se mantuvo durante 72 horas, con excelente control del dolor, tras lo cual se retiró el catéter. La paciente permaneció con adecuada analgesia sin opioides de rescate hasta su alta a los siete días del postoperatorio. El bloqueo del plano del erector espinal torácico continuo fue una técnica eficaz para la analgesia postoperatoria en cirugía abdominal abierta, con bajo riesgo de complicaciones y evitando el uso de opioides.*

Keywords:
Pain management, nerve blockade, anesthesia and analgesia.

Palabras clave:
Manejo del dolor, bloqueo nervioso, anestesia y analgesia.

* Department of Anesthesiology, Instituto Português de Oncologia, Francisco Gentil EPE, Lisboa, Portugal.
‡ Department of Anesthesiology, Hospital José Joaquim Fernandes, ULSBA, Beja, Portugal.

Correspondence:
David Alexandre Correia-Coelho, M.D.
R. Prof. Lima Basto, 1099-023, Lisboa, Portugal
Instituto Português de Oncologia de Lisboa, Francisco Gentil EPE
Anesthesiology Department
Telephone contact: +351 915064646
Fax: 21 724 8735
E-mail: davidalexcoelho@gmail.com

Received: 14-09-2020
Accepted: 01-03-2021

Abbreviations:
ECG = Electrocardiogram.
ESP = Erector Spinae plane.
PT = Prothrombin time.
aPTT = Activated partial thromboplastin time.

INTRODUCTION

Erector spinae plane (ESP) block is an ultrasound-guided technique, whose use was initially described in thoracic neuropathic pain[1], but who has seen a growing role as a perioperative analgesic technique because it is easy to perform and has a low rate of complications[2]. The goal of this block is the cephalo-caudal spread of local anesthetic in the plane located deep to the erector muscles of the spine and superficial to the transverse processes and laminae of the underlying vertebra. It is most commonly used as a single shot technique but the effective use of a catheter for continuous analgesia has also been reported in several clinical scenarios, including thoracic and abdominal surgery, mainly as an opioid-sparing technique in the context of multimodal analgesia[2,3]. Previous studies suggest that its efficacy is due to the local anesthetic action of the dorsal and ventral rami of the spinal nerves[4], as well as possible spread to the paravertebral space, which translates clinically into an analgesia of both somatic and visceral components when

used at the abdominal level[5]. We describe a case of an elderly woman who underwent major open abdominal surgery by left subcostal incision, where a left ESP catheter at the T7 level was used for effective opioid-free analgesia in the postoperative period.

CASE REPORT

An 89 years' old female, ASA physical status III, was scheduled for a segmental colectomy due to a colon adenocarcinoma. The preoperative evaluation revealed a history of stable ischemic heart disease, medicated with acetylsalicylic acid 100 mg/day, and permanent atrial fibrillation (periods of atrial flutter) with controlled ventricular response, under bisoprolol 5 mg/day and anticoagulation with rivaroxaban. She also had a history of dementia syndrome with a mild cognitive impairment and periods of confusion, and a stage IIIb/IV chronic kidney disease. The patient's coagulation was switched to enoxaparin for the perioperative period seven days before the scheduled surgery.

On the day of surgery she was calm and cooperative, and no pharmacological anxiolysis was given. It was ascertained that enoxaparin 40 mg had been given 18 hours previously, as well as her usual aspirin dose. The estimated glomerular filtration rate, according to the most recent lab evaluation, was 29 mL/min/1.73 m^2. Her laboratory results where otherwise unremarkable: hemoglobin 12.4 g/dL, platelets 200 × 10^9/L, PT 11.7 seconds (INR 1.04), aPTT 30 seconds and normal blood electrolytes. A neuraxial technique was considered to have an increased risk of complications. After discussion with the surgical team, it was decided to proceed with surgery, and an ESP catheter was planned for postoperative analgesia.

Intraoperative monitoring included non-invasive blood pressure, pulse oximetry, 3-lead ECG, Bi-Spectral Index® and neuromuscular block quantitative monitoring. An arterial line was placed at the radial artery before induction. There was intermittent intraoperative temperature monitoring and active warming through warm air blanket was used.

The anesthesia was induced with 150 µg of fentanyl and 100 mg of propofol, with endotracheal intubation after 50 mg of rocuronium. A nasogastric tube and urinary catheter were placed. General anesthesia was maintained using sevoflurane titrated for a Bi-Spectral Index of 40-60. 10 mg of ketorolac were administered IV before the start of the procedure, and boluses of fentanyl (1-2 µg/kg) and rocuronium (10 mg) were given throughout the procedure according to monitoring. The surgical procedure lasted two hours 46 min and was uneventful. A total of 450 µg fentanyl was given for intraoperative analgesia, and 30 minutes before the end of the procedure paracetamol 1 g was administered IV. At the end of the procedure, the patient was positioned from dorsal decubitus to left lateral decubitus still under general anesthesia, and the spinous process of T7 was palpated at the level of the inferior angle of the scapula, confirmed by counting downward from the prominent spinous process of C7. The patient's skin was disinfected using chlorhexidine in alcohol, draped and full sterile technique was used throughout the ultrasound imaging and catheter placement. An ultrasound image of the left transverse process of T7 was obtained in a parasagittal plane using a high-frequency linear array (Venue 50-GE Healthcare© device), identifying the target plane under the erector spinae muscles, as previously described[1]. The pleura was visualized in a deeper plane, both cephalad and caudad, throughout the procedure. An 80 mm, 17G Tuohy needle was inserted according to an «in-plane» technique under real-time ultrasound guidance, obliquely in a caudad-cephalad orientation, using the transverse process of T7 as the target. After contact with the bone, the needle was withdrawn slightly, and after a negative aspiration test, 20 mL ropivacaine 0.2% were administered in 5 mL aliquots, confirming the spread of local anesthetic in the intended plane, both cephalad and caudad. A Duraflex® epidural catheter was threaded cephalad 4 cm deep into the same plane and fixed at 8 cm at the skin with sterile dressings.

The patient was repositioned and woken up uneventfully from anesthesia after reversal of neuromuscular blockage with 100 mg of sugammadex. After transfer to the postanesthesia care unit the patient was calm and cooperative. When evaluated for pain, she referred only a low intensity (3 out of 10) resting pain in the left hypochondrium. Since the block procedure had been done approximately 15 minutes prior and the pain was low in intensity, no rescue analgesic was immediately given, and when reevaluated 10 minutes afterwards the patient denied any pain at rest. No motor block was observed. She required no further intervention for control of pain and was transferred to the infirmary with a 0.2% ropivacaine perfusion at 8 mL/h by the left ESP catheter, with rescue bolus of 15 mL each six hours by the nursing staff if needed. As multimodal analgesia, 1 g paracetamol IV 8-8 h + 1g metamizol IV 8-8 h were also prescribed.

The patient kept the same opioid-free analgesic scheme, was daily evaluated by the acute pain service and maintained pain < 3/10 in the visual analog scale without need for rescue bolus or further systemic analgesia. No complications were noted, and she started oral intake in the second postoperative day. 72 h after the procedure the ESP catheter was removed, and the patient's pain remained controlled with the same IV medication until the patient's discharge home seven days after the procedure.

DISCUSSION

Although thoracic epidural is considered the gold standard for postoperative analgesia in major open abdominal surgery,

it can also have significant side effects such as hypotension and motor blockade, and major complications can occur, such as epidural hematoma and abscess, particularly in high-risk patients. In this case, due to recent aspirin and enoxaparin administration (in the context of a patient with diminished glomerular filtration rate), a neuraxial technique was considered to have an increased risk of epidural hematoma. However, this procedure had the potential to cause severe postoperative pain, and avoidance of systemic opioids was desirable due to the associated increased risk of side effects, such as postoperative ileus and delirium[6]. The use of an ESP catheter was an attractive alternative, since the same complications have not been described for this block, and its safe use in the setting of coagulopathy has been described[7]. Due to the subcostal approach, a unilateral procedure which requires only one catheter was also possible, and a T7 level was chosen since it has been previously reported to produce a dermatomal coverage of approximately T5 to L2[8]. Since the surgical team had stated that the initial surgical approach might be modified if technical difficulties were encountered, the block was not performed until the end of the surgical procedure. Nevertheless, in most cases it would probably be advantageous to perform it before the incision and obtain not only postoperative but also an intraoperative opioid-sparing effect. Since this block is performed It is noteworthy that although abdominal plane blocks are typically described as dependent on a relatively large volume to achieve better results, effective analgesia was obtained with a continuous infusion regimen of dilute local anesthetic at only 8 mL/h, and no rescue boluses were required. However, it is still unclear what is the optimal infusion rate, and if patient-controlled or programmed intermittent bolus regimen may offer any advantages over continuous infusion. Further studies are needed to clarify the role of continuous ESP block for opioid-free postoperative analgesia for major abdominal surgery.

CONCLUSION

An ultrasound guided, unilateral ESP continuous block through a catheter placed at the T7 level, with a 20 mL bolus of ropivacaine 0.2% followed by an infusion at 8 mL/h was effective in this case of multimodal, opioid-free analgesia following segmental colectomy by left subcostal incision, with no complications. Further experience and prospective studies might help clarify the potential and optimal method of continuous ESP block for open abdominal surgery.

REFERENCES

1. Forero M, Adhikary SD, Lopez H, Tsui C, Chin KJ. The erector spinae plane block: a novel analgesic technique in thoracic neuropathic pain. Reg Anesth Pain Med. 2016;41:621-627.
2. Kot P, Rodriguez P, Granell M, Cano B, Rovira L, Morales J, Broseta A, Andrés JD. The erector spinae plane block: a narrative review. Korean J Anesthesiol. 2019;72:209-220.
3. Tsui BCH, Fonseca A, Munshey F, McFadyen G, Caruso TJ. The erector spinae plane (ESP) block: a pooled review of 242 cases. J Clin Anesth. 2019;53:29-34.
4. Ueshima H, Hiroshi O. Spread of local anesthetic solution in the erector spinae plane block. J Clin Anesth. 2018;45:23.
5. Chin KJ, Malhas L, Perlas A. The erector spinae plane block provides visceral abdominal analgesia in bariatric surgery: a report of 3 cases. Reg Anesth Pain Med. 2017;42:372-376.
6. Rengel KF, Pandharipande PP, Hughes CG. Special considerations for the aging brain and perioperative neurocognitive dysfunction. Anesthesiology Clin. 2019;37:521-536.
7. Maddineni U, Maarouf R, Johnson C, Fernandez L, Kazior MR. Erector spinae block for treatment of acute pain. Am J Case Rep. 2020;21:e921123.
8. Restrepo-Garces CE, Chin KJ, Suarez P, Diaz A. Bilateral continuous erector spinae plane block contributes to effective postoperative analgesia after major open abdominal surgery: a case report. A Case Rep. 2017;9:319-321.