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CLINICAL INFORMATION

Bilateral lower thoracic erector spinae plane block in open abdominal gynecologic oncology surgery: a cases series

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KEYWORDS
Postoperative pain;
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Abstract
Objective and background: Erector spinae plane block is a novel analgesic truncal block that has been popularized due to its ease of performance and perceived safety. Erector spinae plane block has been postulated to target the ventral rami and rami communicates of spinal nerves, thus providing somatic and visceral analgesia. In this case series, we describe our experience of bilateral erector spinae plane block placed at the low thoracic level in open gynecologic oncology surgery in three patients.
Method: Under ultrasound guidance, erector spinae plane blocks were done, preoperatively, at the 8th thoracic transverse process bilaterally. Numeric rating scale for pain and opioid consumption of the first 48 postoperative hours were recorded.
Results: Pain scores ranged from 0 to 4 among the three patients and 48 h opioid consumption in oral morphine equivalents of 4, 6 and 18 mg. No adverse events were recorded up to patient discharge from the hospital.
Conclusions: Erector spinae plane block provided effective analgesia in our case series. While its true mechanism of action remains obscure, the available case reports show encouraging analgesic results with no adverse events recorded. Formal prospective randomized trials are underway to provide further evidence on its efficacy, failure rate and safety.

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PALAVRAS-CHAVE
Dor pós-operatória;
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Bloqueio do plano transverso do abdome;
Bloqueio do plano eretor da espinha

Bloqueio bilateral do plano eretor da espinha torácica em cirurgia oncológica ginecológica aberta por via abdominal: série de casos

Resumo
Justificativa e objetivo: O bloqueio do plano do músculo eretor da espinha é um novo bloqueio troncular analgésico que foi popularizado devido à sua facilidade de realização e segurança percebida. O bloqueio do plano do músculo eretor da espinha foi postulado para atingir os ramos ventrais e os ramos comunicantes dos nervos espinhais, proporcionando analgesia somática e visceral. Nesta casuística, descrevemos nossa experiência com o bloqueio do plano do músculo eretor da espinha bilateral depositado no nível torácico inferior em cirurgia oncológica ginecológica aberta em três pacientes.
Método: Os bloqueios do plano do músculo eretor da espinha guiados por ultrassom foram administrados no pré-operatório, entre o 8° e o 10° processo transverso do tórax bilateralmente. Os valores de uma escala de classificação numérica para dor e consumo de opioides nas primeiras 48 horas de pós-operatório foram registrados.
Resultados: Os escores de dor variaram de 0–4 entre as três pacientes e o consumo de opioide em 48 horas equivaleu à morfina oral (4, 6 e 18 mg). Nenhum evento adverso foi registrado até a alta hospitalar das pacientes.
Conclusões: O bloqueio do plano do músculo eretor da espinha proporcionou analgesia efetiva em nossa casuística. Embora o mecanismo de ação verdadeiro permaneça obscuro, os relatos de casos disponíveis mostram resultados analgésicos encorajadores, sem eventos adversos registrados. Ensaios prospectivos randômicos formais estão em andamento para fornecer mais evidências sobre sua eficácia, taxa de falha e segurança.

Introduction

Erector spinae plane block (ESPB) is an interfacial plane block that provides truncal analgesia. Originally described in 2016 as an analgesic technique for thoracic neuropathic pain, ESPB has since been applied in abdominal procedures.[1,2] While the mechanism of ESBP requires further investigation, some postulate the target to be the ventral rami of spinal nerves.[1,3] Recent randomized trials have showed ESPB to reduce pain scores in cardiac and breast surgeries.[4,5] Although no formal trials have been published for abdominal procedures, a case report suggests that ESPB may provide both somatic and visceral blockade.[2] Here we report our experience of bilateral single-shot ESPB at T8 as part of multimodal analgesia in three patients undergoing major open abdominal gynecologic oncology surgery.

To date, no publication has reported on the use of ESPB in gynecologic oncology procedures. Here we report the use of ESPB as part of multimodal analgesia in three patients undergoing major open abdominal gynecologic oncology surgery.

Case reports

Written informed consent for case report publication was obtained from all three patients. Our institutional research ethics board does not require approval for case reports.

Case 1

Patient 1 was a 71 year-old female, body mass index (BMI) 22.5 $kg.m^{-2}$ with no known medical issues and not on any medication. She was found to have a large complex ovarian mass. She had a total abdominal hysterectomy – bilateral salpingoophrectomy (TAH-BSO) via a midline laparotomy that extended to the supraumbilical region. A bilateral ESPB was performed 30 minute prior to the operation. In sitting position, the transverse process (TP) of the 8th thoracic spine was identified using a linear ultrasound (12–15 MHz) transducer (M-Turbo, Sonosite, Bothell, MA) placed in the para-sagittal plane. Under sterile technique and after infiltrating the skin with 3 mL of 1% lidocaine, an 80 mm, 22 gauge needle (Stimulex Ultra 360, B. Braun Medical Inc., Bethlehem, PA) was inserted out-of-plane lateral to ultrasound probe. After contacting the TP, 1 mL dextrose was injected to confirm correct needle placement followed by a total of 20 mL 0.5% Ropivacaine injection deep to the erector spinae muscle (Fig. 1). A contralateral block was performed in a similar fashion. No additional preoperative analgesia was provided. General anesthesia was induced with fentanyl 100 μg, propofol 100 mg and rocuronium 30 mg. After endotracheal intubation, patient was maintained on 0.8–1.2 MAC of Sevoflurane. Intraoperatively, the patient received dexamethasone 6 mg, ondansetron 4 mg, hydromorphone 0.4 mg. Once fully awake, she was placed on an Intravenous (IV) hydromorphone patient-controlled analgesia (PCA), oral naproxen 250 mg twice daily and acetaminophen 650 mg every 6 h. On the second postoperative day (POD), her PCA

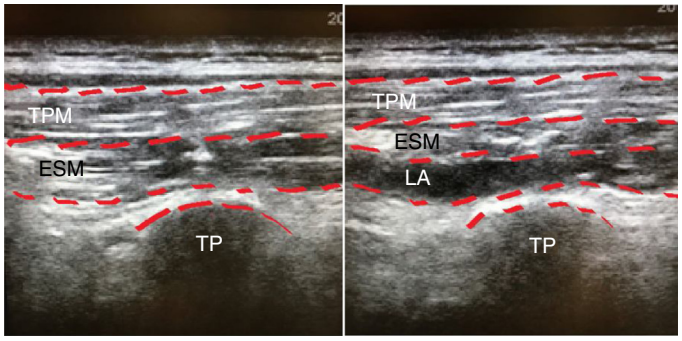

Figure 1 Ultrasound image of ESPB performed at transverse process of the lower thoracic spine. Left, pre-injection; Right, post-injection. TPM, trapezius muscle; ESM, erector spinae muscle; LA, local anesthetic; TP, transverse process.

was stopped and she was started on oral hydromorphone 2 mg as needed. Her pain score on a 0–10 (10 being the worst pain) Numeric Rating Scale (NRS) ranged from 0 to 2 and 3 to 4 in the first and second POD and her postoperative opioid consumption in IV morphine equivalents was 15 mg and 3 mg in the corresponding periods. Her stay in the post-anesthetic care unit (PACU) and hospital were 100 min and 65 h respectively. The block duration was 12 h until there was no discernable difference in sensation to ice at the abdomen and her hand. No adverse events were recorded.

Case 2

Patient 2 (BMI 24 $kg.m^{-2}$) was a 78 year-old female who underwent a TAH-BSO and omentectomy for a stage IA clear cell carcinoma of the ovary. She had hypothyroidism and a history of clipped ruptured aneurysm in 2008. She had no neurologic deficit. Her medication included levothyroxine. Bilateral ESPB at 8th TP was performed 30 minute pre-operatively as described in the previous case with 20 mL 0.5% Ropivacaine injected on each side. During an uneventful general anesthetic and surgery, she received fentanyl 125 μg, hydromorphone 0.8 mg, dexamethasone 6 mg and ondansetron 4 mg postoperatively; she received IV hydromorphone PCA and oral acetaminophen 650 mg every 6 h. Her PCA was stopped the morning following the surgery and switched to oral hydromorphone 2 mg as needed. During the first and second POD, her NRS pain score ranged from 2 to 4 and 2 to 3, and opioid consumption in IV morphine equivalents are 4 mg and 0 mg respectively. Her PACU and Hospital stay are 80 min and 100 h respectively. Her block distribution was not assessed due to time constraint and duration was 16 h. No adverse events were recorded.

Case 3

Patient 3 (BMI 29 $kg.m^{-2}$) had an uneventful TAH-BSO with lymphadenectomy for a stage IB endometrial adenocarcinoma. Her medical history includes myocardial infarction in 2010, 50 pack year smoking history, obstructive sleep apnea and Type 2 diabetes. All her medical conditions were optimized, and she was not on any antiplatelet or anticoagulants except aspirin. Her bilateral ESPB were performed at T8, preoperatively with patient in the left lateral decubitus position and an out-of-plane approach but otherwise similar to previously described. Twenty milliliter of 0.5% Ropivacaine was injected at each side. Under general anesthetic, she had fentanyl 100 μg, hydromorphone 0.4 mg and dexamethasone 4 mg. She was started on an IV hydromorphone PCA in PACU and switched to oral hydromorphone 2 mg orally as needed on the second POD. She received acetaminophen 650 mg every 6 h orally. During the first and second POD, her NRS pain score ranged 0–2, and 0–2 and opioid consumption in IV morphine equivalent at 6 mg and 0 mg respectively. Her PACU stay was 120 min and hospital stay 120 h. Her block distribution extended from upper abdomen to upper thigh and a block duration of 12 h. No adverse events were noted.

Discussion

Optimal multimodal analgesia in gynecologic oncology surgery should aim at reducing opioid consumption while avoiding delaying recovery. When compared to systemic opioids, Thoracic Epidural Analgesia (TEA) leads to shorter duration of ileus and improved pain score in open abdominal procedures,[6] however, its role is less clear in gynecologic oncology procedures. The Enhanced Recovery after Surgery (ERAS®) Society cautions the routine use of TEA in gynecologic oncology procedures, citing its high failure rate, requirement of supplemental opiates and incidence of hypotension. Importantly, TEA may lengthen hospital stay due to delayed mobilization and urinary retention.[6]

In a meta-analysis, when managed with systemic analgesics only, the average pain score in gynecologic oncology procedures, at 2 h and 24 h postoperatively is 4.45–6.8 and 1.1–3.94 respectively.[7] This suggests that acute pain following gynecology oncology procedures may be most severe in the early postoperative period. Bilateral single-shot ESPB, with its extensive dermatomal coverage, proposed mechanism of ventral rami and rami communicates blockade,[2,3] and an observed duration of 12–14 h in our patients, may be well suited for this surgical population. Further, our 3 patients experienced relatively mild pain that ranged between 0 and 4 which may attest to the potential efficacy of ESPB.

Being a novel block, the contraindication and complications of ESPB are not well understood. Selvi and Tulgar reported an unexpected case of lower limb weakness after ESPB at T8 that was provided for cesarean section.[8] Ueshima recently published a case of

pneumothorax following a seemingly uncomplicated ESPB at T4.[9] On the other hand, three published randomized trials totaling 188 patients did not record any adverse event related to ESPB placed at T4, T6 and T9.[4,5,10]

In conclusion, the relatively mild pain that was experienced by our 3 patients may serve as preliminary evidence that ESPB can be an effective analgesia in gynecologic oncology procedures. Randomized controlled trials are necessary to further delineate its efficacy and safety in abdominal procedures.

Conflicts of interest

The authors declare no conflicts of interest.

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