

## CASE REPORTS

# Ultrasound-guided quadratus lumborum block for surgical treatment of endometriosis: case report



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**Abstract** Quadratus lumborum block (QLB) is a technique that is not widely applied for gynecological surgery. Endometriosis affects 10% of the female population and chronic pelvic pain is one of the most prevalent symptoms. Laparoscopic surgery for removal of endometriosis may present a long intra-operative duration and this technique might improve postoperative pain control. We described a case report of a patient submitted to general anesthesia associated to bilateral QLB for pelvic endometriosis. QLB was an adjuvant anesthetic technique for endometriosis, providing somatic and visceral analgesia. However, prospective studies are needed to identify the standard dosage and total duration of analgesia.

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## Introduction

Quadratus lumborum block (QLB) is an analgesic technique guided by ultrasonography that introduces a local anesthetic into an interfascial plane that comprises the QL muscle aiming to block the thoracolumbar nerves.<sup>1</sup> Blanco was the

first one to describe it in 2007<sup>2</sup> and some published case reports and randomized controlled studies have shown that QLB is effective to provide pain relief after several types of abdominal surgeries.<sup>3</sup> Endometriosis is defined as the presence of endometrial tissue outside the uterine cavity and one of its common symptoms are chronic pelvic pain, dysmenorrhea, deep dyspareunia, dysuria and dyschezia.<sup>4</sup> Surgical treatment of endometriosis is mostly indicated for pain relief or infertility that is refractory to clinical treatment, or advanced clinical spectrum of this disease, such as

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deep infiltrating endometriosis. Reducing the endometriotic foci is the main goal of surgery.<sup>4</sup> There is scant literature regarding the use of QLB in female pelvic surgery, most of good available data being concentrated in obstetric procedures. Within gynecological procedures, there is a randomized study comparing QLB versus transverse abdominal plane (TAP) block in women that underwent total abdominal hysterectomy,<sup>5</sup> a case report on the postoperative management of refractory pain after uterine artery embolization, and another randomized study assessing quality of life after gynecological laparoscopic surgery with QLB. The use of myofascial regional block techniques guided by ultrasonography, especially for pelvic surgeries such as endometriosis, may be beneficial as adjuvant strategy for pain control during intra and postoperative period. To this moment, there are no reports about the use of QLB for gynecological surgery for treating endometriosis.

## Case report

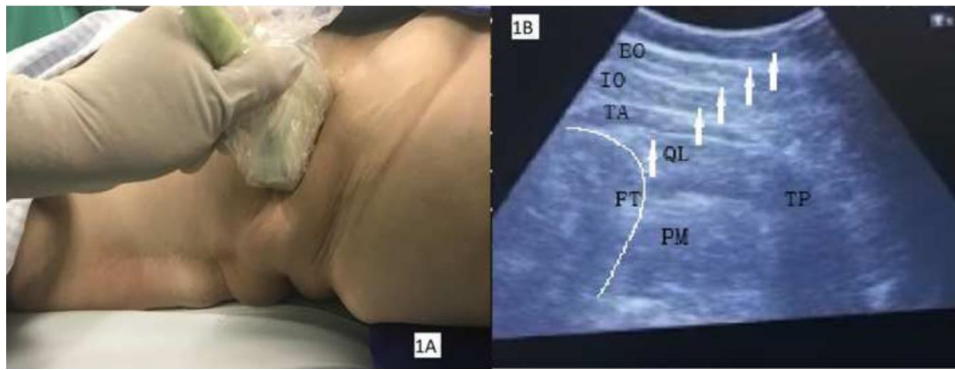
A 39-year-old woman, ASA (American Society of Anesthesiologists) physical status II due to anxiety disorder with no current treatment, 70 kg, 1.67 m, nulliparous, with diagnosis of primary infertility and deep infiltrating endometriosis diagnosed by pelvic ultrasound was submitted to surgical treatment of endometriosis. Preoperative pelvic imaging has found kissing ovaries, endometriotic foci on the upper portion of rectum, left uterosacral ligament, left round ligament, left vesicouterine space, and endometriotic lesions at anterior uterine serosae with myometrial infiltration. She presented chronic pelvic pain, intense menstrual flow, cyclic deep dyspareunia, with no dyschezia or dysuria. A laparoscopic surgery was planned; however, due to the extent of lesions within the abdominal cavity, a conversion to laparotomy was performed. After informed consent to undergo QLB during general anesthesia, patient was admitted in the operating room with previous venoclysis. Patient was submitted to noninvasive monitoring (cardioscopy, peripheral oxygen saturation, temperature, capnography, NIP), 4 mg intravenous (IV) midazolam. General anesthesia induction was done with remifentanyl, propofol, and rocuronium, and total IV maintenance with remifentanyl and propofol. Subsequently, alcoholic chlorhexidine was applied in the abdominal region bilaterally to posterior axillary line and ipsilateral to the region where QLB was performed. An infragluteal cushion was customized and gave support to the procedure area (Figure 1A). A curve transducer was used to obtain the images, and from the median to posterior axillary lines, it was identified the abdominal rectus muscle, as well as the three muscles of the lateral abdominal wall (external oblique, internal oblique, and transversus abdominus). A more hyperechoic structure with posterior acoustic shadow was seen (Shamrock signal) where the QL and psoas muscles were visualized. Probe was kept in a transverse plane, L4 level between middle and posterior axillary line, and a Tuohy 18G needle was introduced postero-anteriorly. After negative aspiration, 35 ml bupivacaine 0.25% plus 1:200,000 adrenaline was injected between QL and psoas muscles (Figure 1B). The duration of the anesthetic procedure was 340 minutes. In summary, it was used 2,981 mg of propofol, 3,788 mcg of remifentanyl and 50 mg

of rocuronium. Intraoperatively, 10 mg dexamethasone, 1 g tranexamic acid, 100 mg ketoprofen, and 8 mg ondansetron were administered. Estimated blood loss was 600 ml and crystalloids were administered, as well as IV metaraminol 0.5 mg. She remained in the postanesthesia care unit for 165 minutes and after 150 minutes post extubation she had her first complaint of pain at the incision area. VAS score was 1 (range: 0-10) after 2, 6, 12, and 24 hours after surgery. Hospital length stay was of 60 hours and she was discharged home with normal vital signals, VAS between 0 and 1, ambulating. Intravenous sodium dipyrone 1 g 6/6 h and 40 mg tenoxicam 12/12 h was applied to this patient within 24 and 48 hours.

## Discussion

This case report has shown that the QLB use as an adjuvant for pain control after surgical treatment of advanced endometriotic lesions was effective and has meaningfully reduced the VAS score during immediate postoperative period. Differently from laparoscopic procedures, this was an open surgery, and if we consider the extensive disease that was confirmed intraoperatively, there was a high probability of presenting high VAS scores in the postoperative period, as well as for using intravenous opioids towards pain control.<sup>3</sup> This patient presented minimum VAS score during the first 24 hours after surgery, and she did not use any opioids at any time. Yousef<sup>5</sup> has performed a randomized controlled study comparing postoperative pain control using QLB versus transverse abdominus plane block for women undergoing total abdominal hysterectomy. QLB presented better intra and postoperative analgesic control (lower VAS, higher postoperative analgesic duration, and less patients requesting analgesics), as well as lower administration of fentanyl and morphine. There is a discussion about a possible visceral analgesic effect caused by QLB, different from other peripheral blocks where sympathetic innervation could receive the anesthetic by dissection and dispersion through pre and paravertebral ganglia.<sup>1</sup> Anatomically, as Blanco described,<sup>2</sup> quadratus lumborum block (QLB) is a posterior abdominal block that allows local anesthetic to spread posteriorly to the quadratus lumborum muscle and expand beyond the middle layer of the thoracolumbar fascia in a triangular space called the lumbar interfascial triangle. This interfascial plane is in close relation with multiple sympathetic nerves and connects with the thoracic paravertebral space. We believe the local anesthetic effect on the thoracolumbar fascia is the main component for the QLB, however, further understanding of its anatomic and histologic role is needed, as the true mechanism of the QLB block is still unknown. The spread into the paravertebral space may also have an effect. It seems that a more posterior blockade approach is more effective than the conventional transversus abdominus plane (TAP).

Large-volume injections of local anesthetic, typically a long-acting amide such as ropivacaine or bupivacaine 0.125–0.375% (15–30 mL per side, 0.2–0.4 mL.kg<sup>-1</sup>) injected into any of these fascial planes affect the adjacent nerve fibers, such as the lateral cutaneous branches of the iliohypogastric, ilioinguinal, and subcostal nerves, with potential to track into the paravertebral space. This posterior spread



**Figure 1** Ultrasound probe position (superior and medial to anterior iliac crest) for adequate visualization of the quadratus lumborum complex (A). Anatomic landmarks for quadratus lumborum block: needle projection from skin to place for injecting the anesthetic (arrow); bound between muscles and abdominal content (curved line) (B). EO, external oblique; IO, internal oblique; TA, transversus abdominis; Q, quadratus lumborum; PM, psoas muscle; TP, transverse process; FT, fascia transversalis.

into the paravertebral space can potentially affect the sympathetic chain, conferring visceral as well as somatic analgesia. There are currently four described QL block approaches.<sup>1</sup> The first approach, QL1 or commonly known as the lateral QL, is an injection deep to the transversus abdominis aponeurosis. The second approach, QL2, also referred to as posterior QL, is an injection deep to the erector spinae muscle, with deposition of local anesthetic posterior to the QL muscle. The transmuscular (QLT) or anterior approach is an injection into the plane between the psoas major muscle and the QL muscle. Finally, for the intramuscular QL (QLI) described in the pediatric population, local anesthetic is injected directly into the QL muscle. QL block has been associated with reduced postoperative opioid consumption and pain scores in patients undergoing cesarean delivery, but these studies have been challenging to interpret given the lack of study groups receiving standardized multimodal analgesia with neuraxial morphine. Blanco et al showed that QL posterior approach (QL2) injection of 0.125% bupivacaine at 2 mL.kg<sup>-1</sup> compared with saline placebo after caesarean delivery reduced use of morphine at 6 and 12 hours, diminished morphine requests at 6, 12, 24, and 48 hours, and lowered pain scores during movement and at rest, except after 24 hours.<sup>3</sup> Endometriosis is a hyperinnervated inflammatory disease and postoperative pain control is a difficult task. Moreover, it is important to reduce the use of opioids in these patients during postoperative period. The use of QLB as a technique may benefit women recovering from this surgery, and possibly other gynecological benign disorders with extensive pelvic lesions. Future prospective randomized studies are necessary comparing women submitted to general anesthesia plus peripheral blockade techniques such

as QL with other techniques (neuroaxis blockade, intravenous opioids) as well the establishment of adequate doses for optimal pain control.

### Conflict of interests

The authors declare no conflicts of interest.

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