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CLINICAL INFORMATION

Continuous quadratus lumborum type II block in partial nephrectomy



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KEYWORDS

Partial nephrectomy;
Quadratus lumborum
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Abstract

Background and objectives: Quadratus lumborum block was first described in 2007 and currently there are descriptions of its achievement through four different injection points. This blockage provides abdominal wall and visceral analgesia, and one of its mechanisms is the dispersion of the local anesthetic into the paravertebral space. We describe the performance of a continuous quadratus lumborum type II block for postoperative analgesia in a partial nephrectomy.

Case report: A 64-year-old woman, scheduled for partial left laparoscopic nephrectomy. During the procedure, due to technical difficulties, an incision was made in the left flank to facilitate the surgical approach. In the early postoperative period, a continuous quadratus lumborum type II block was performed using ultrasonography as part of the multimodal analgesic strategy. Initially, 20 ml of 0.2% ropivacaine was administered and 3 cm of catheter were introduced into the interfascial space. Subsequently, a continuous infusion of $5.2 \text{ mL} \cdot \text{h}^{-1}$ of 0.2% ropivacaine was given for 48 hours. In the first 24 postoperative hours, the patient reported no pain at rest or on movement. In the following 24 h, she was free of pain at rest and only a slight pain (2/10) on movement.

Conclusions: Continuous quadratus lumborum type II block was an effective postoperative analgesic option. Blocking of somatic nerves and visceral afferent pathways provided abdominal and visceral wall analgesia, allowing the reduction of opioid consumption. We consider relevant to explore the analgesic capacity of the quadratus lumborum block and its different approaches, as well as the possibility of it becoming an alternative in patients scheduled for kidney surgery.

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PALAVRAS-CHAVE

Nefrectomia parcial;
 Quadrado lombar tipo
 II contínuo;
 Analgesia
 pós-operatória;
 Ultrassonografia

Bloqueio do quadrado lombar tipo II contínuo para analgesia pós-operatória de nefrectomia parcial

Resumo

Justificativa e objetivos: O bloqueio do quadrado lombar foi descrito pela primeira vez em 2007 e atualmente existem descrições da sua realização através de quatro pontos de injeção. Esse bloqueio promove analgesia da parede abdominal e analgesia visceral e um de seus mecanismos é a dispersão do anestésico local para o espaço paravertebral. Descrevemos a realização do bloqueio do quadrado lombar tipo II contínuo para analgesia pós-operatória numa nefrectomia parcial.

Relato de caso: Mulher de 64 anos, agendada para nefrectomia parcial à esquerda por via laparoscópica. Durante o procedimento, por dificuldades técnicas, foi feita uma incisão no flanco esquerdo para facilitar a abordagem cirúrgica. No pós-operatório imediato, fez-se o bloqueio do quadrado lombar tipo II contínuo, recorrendo-se a ultrassonografia, como parte da estratégia analgésica multimodal. Inicialmente foram administrados 20 ml de ropivacaína 0,2% e introduzidos 3 cm de cateter no espaço interfascial. Posteriormente, colocou-se uma perfusão contínua de 5,2 mL.h⁻¹ de ropivacaína 0,2% durante 48 horas. Nas primeiras 24 horas de pós-operatório, a paciente não referiu dor em repouso ou com movimento. Nas 24 horas seguintes, manteve-se sem dor em repouso e apenas com dor ligeira (2/10) com o movimento.

Conclusões: A realização do bloqueio quadrado lombar tipo II contínuo foi uma opção analgésica pós-operatória eficaz. O bloqueio de nervos somáticos e das vias aferentes viscerais promoveu analgesia da parede abdominal e visceral, permitiu reduzir o consumo de opióides. Consideramos relevante explorar a capacidade analgésica do bloqueio do quadrado lombar e suas diferentes abordagens, bem como a possibilidade de se tornar uma opção em doentes propostos para cirurgia renal.

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Introduction

Quadratus lumborum block (QLB) was first described by Rafael Blanco in 2007 during the European Congress of Regional Anesthesia as a variation of the posterior approach to ultrasound-guided transversus abdominis plane block. Over the last 10 years, reports on its applicability, new points of injection of local anesthetic, and several possible approaches have been published. Thus currently there are descriptions of the blockage through four injection points. The lateral (or type I) QLB consists of injecting the local anesthetic into the anterolateral border of the quadratus lumborum (QL) muscle, at its junction with the transverse fascia, deep into the aponeurosis of the transverse abdominal. In posterior QLB (or type II) the local anesthetic is deposited on the posterior border of the QL muscle, ideally in the lumbar interfascial triangle. Another description is the anterior QLB in which the LA injection is applied anteriorly to the QL muscle. In intramuscular QLB the LA is injected into the QL muscle.^{1,2}

Currently, QLB is considered as an effective analgesic technique for abdominal surgery; however, the best approach has not yet reached consensus. The lack of understanding the mechanisms involved in this blockade analgesia, as well as the uncertainty about the local anesthetic spread to the paravertebral space, contributes to this lack of consensus and standardization of practices.²⁻⁴ Studies using nuclear magnetic resonance imaging and comparing

QLB type I (lateral) and QLB type II (posterior) have shown that QLB type II has a larger, more predictable and more consistent spreading of local anesthetic into the paravertebral space. Thus, it promotes analgesia of a greater number of sensory levels and a greater extension of sympathetic blockade.^{1,2,4}

In addition, QLB type II has the advantage of being a more superficial blockade; it allows a better ultrasound image and is safer, as the injection point is behind the quadratus lumborum muscle and further away from the peritoneum and neurovascular structures.¹⁻³ Thus, we can consider this QLB approach simpler and safer.

Recently, it has been shown that the lumbar interfascial triangle is the optimal point of injection for QLB type II approach. This triangular space serves as a conduit for local anesthetic spread into the thoracic paravertebral space and has a network of sympathetic and mechanoreceptor fibers, structures which are assigned an important role in the effects of QLB and its action in the control of acute pain.^{2,4}

To the best of our knowledge there is only one case report in which a continuous type I QLB was performed for kidney surgery in a child.⁵

We report a case in which a unilateral continuous type II QLB was performed as part of the postoperative multimodal analgesic approach in an adult patient undergoing left partial nephrectomy.

Case report

A female patient, 64 years old, 60 kg, ASA II, with a history of chronic gastritis and osteoarticular disease who presented with duplication of the renal pelvis with marked renal calyces dilatation in the upper pelvis, which motivated the surgical treatment. The patient was indicated to partial left laparoscopic nephrectomy with retroperitoneal approach.

Balanced general anesthesia was the anesthetic approach chosen. Induction of anesthesia was performed with fentanyl (0.15 mg), propofol (120 mg), and rocuronium (40 mg). Sevoflurane was used for anesthetic maintenance. Due to difficulties in the surgical technique, the team had to make an incision at the level of the left flank to facilitate the approach. The surgery lasted 4 h, during which 0.20 mg of fentanyl, 1 g of paracetamol, 100 mg of tramadol, 4 mg of ondansetron, and 4 mg of dexamethasone were administered.

Considering the unpredicted increase in duration of surgery, with increased manipulation and change in approach, at the end of surgery we chose to perform a continuous quadratus lumborum type II block on the left side as a postoperative analgesic technique. At that time, it was not necessary to mobilize the patient again, who was already in the right lateral decubitus position. The blockade was performed with the patient still under general anesthesia.

The technique was guided by ultrasound under asepsis conditions using a high frequency (12 MHz) linear probe and vivid I GE ultrasound, needle and perineural catheter (Pajunk® – StimuLong Sono II) with a 19G and 100 mm needle.

Initially, the probe was placed in the lateral abdominal wall, transversely, at the mid-axillary line level between the anterior superior iliac spine and the lower edge of the costal arches. The probe was then slid posteriorly, following by the external oblique muscle to its posterior portion, and the quadratus lumborum muscle was identified.

In the approach used, the needle was introduced into the ultrasound plane, with lateromedial orientation to the posterior border of the quadratus lumborum muscle in the lumbar interfascial triangle (Fig. 1). The position was confirmed by hydrodissection with 4 mL of saline solution. Before the introduction of the catheter, in order to facilitate its passage, 15 ml of 0.2% ropivacaine was administered, the spread of the anesthetic and separation of the fascial planes were observed. At that time, 3 cm of catheter was inserted through the needle into the interfascial space. The needle was withdrawn taking care not to change its position. After confirming negative aspiration, a further 5 ml of 0.2% ropivacaine was administered under ultrasound visualization and the catheter position was confirmed.

For postoperative analgesia, the patient received a continuous infusion of 0.2% ropivacaine ($5.2 \text{ mL} \cdot \text{h}^{-1}$) for 48 h. The patient's postoperative multimodal analgesia schedule included the intravenous administration of paracetamol (1 g every 8 h) and rescue tramadol (100 mg every 8 h).

During the first 24 postoperative hours, the patient had ipsilateral sensory block in dermatomes from T6 to L1 and did not report pain at rest or with movement. In the next 24 h, there was also no pain at rest and only slight pain (2/10) with movement; there was no need to use rescue analgesia

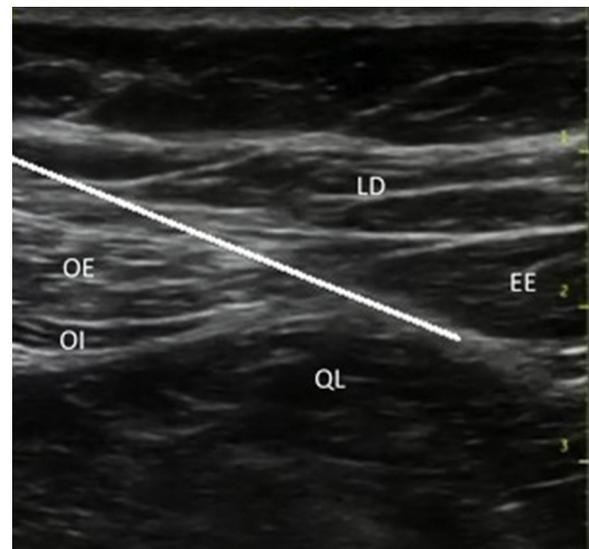


Figure 1 Ultrasound image with needle representation and continuous the approach to quadratus lumborum block type II. LD, latissimus dorsi; EE, erector spinae; OE, external oblique; OI, internal oblique; QL, quadratus lumborum.

with tramadol. During postoperative follow-up, the patient had no associated side effects.

Conclusion

Quadratus lumborum block is a relatively recent blockade, and it remains unclear which approach is most effective and with better visceral analgesia beyond abdominal wall analgesia.²

We consider that continuous QLB type II was an effective and useful postoperative analgesic option in this case, in which the surgical approach required more manipulation. There was no need to use rescue analgesia with tramadol during the first 48 h. The fact that QLB provides abdominal and visceral wall analgesia by blocking somatic and sympathetic nerves became an advantageous option in the present case, as it provided better analgesia to the patient, reduced opioid consumption and consequently the side effects, namely postoperative nausea and vomiting and hyperalgesia. The option for a continuous technique was aimed at achieving a prolonged analgesia. In this surgery there is also the advantage of not having to mobilize the patient to perform the blockade postoperatively.

The postoperative follow-up of the patient allowed us to conclude that this was a well-tolerated technique, with few associated side effects and good visceral and abdominal wall analgesic capacity.

In renal surgery, both paravertebral and epidural block provide good analgesia, but they present a greater number of associated risks. The paravertebral block has associated risk of hypotension, vascular puncture, epidural or intrathecal dispersion, pleural puncture, and pneumothorax. The epidural block presents the risk of postdural puncture headache, hypotension, intrathecal administration of anesthetic, infection, epidural hematoma, and neurological complications. Thus, QLB type II has the advantage

of theoretically having fewer associated risks and has been shown to be a safe blockade with fewer reported complications.^{2,3,5}

In the present reported case, continuous QLB type II was effective as part of postoperative multimodal analgesia.

In conclusion, it is necessary to further explore the quadratus lumborum block analgesic capacity, namely the continuous technique; by means of more publications and studies with more patients comparing the various approaches, in order to assess the possibility of becoming an option to the neuraxial approach in patients scheduled for renal surgery.

Conflicts of interest

The authors declare no conflicts of interest.

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