Continuous Bilateral Posterior Lumbar Plexus Block with a Disposable Infusion Pump. Case Report

Luiz Eduardo Imbelloni, TSA 1, Eneida Maria Vieira 2, Fábio Stuchhi Devito 3, Eliana Marisa Ganem, TSA 4

Summary: Imbelloni LE, Vieira EM, Devito FS, Ganem EM – Continuous Bilateral Posterior Lumbar Plexus Block with a Disposable Infusion Pump. Case Report.

Background and objectives: The number of bilateral total hip arthroplasties (THA) has been increasing every year. Postoperative analgesia by continuous perineural infusion of local anesthetic has been shown favorable results when compared to systemic analgesia. The use of elastomeric pumps has increased patient satisfaction when compared to electronic models. The objective of this report was to describe a case of continuous bilateral posterior lumbar plexus block with an elastomeric infusion pump in a patient submitted to bilateral hip arthroplasty.

Case report: This is a 46 year-old female patient weighing 65 kg, 162 cm, with rheumatoid arthritis and hypertension, physical status ASA II, scheduled for bilateral THA in a single stage. She had been on corticosteroids for 13 years. Hemoglobin = 10.1 g.dL⁻¹, hematocrit = 32.7%. Routine monitoring. Spinal anesthesia with 15 mg of 0.5% isobaric bupivacaine. General anesthesia with propofol (PFS) and remifentanil, and intubation without neuromuscular blocker. Right THA and, at the end, lumbar plexus block with a stimulator and a set of 150 mm needle and injection of 20 mL of 0.2% bupivacaine and introduction of a catheter. Left THA and, at the end, the same procedure. Anesthetic dispersion and contrast were without neuromuscular blockers. Right THA and, at the end, lumbar plexus block with a stimulator and a set of 150 mm needle and injection of 20 mL of 0.2% bupivacaine and introduction of a catheter. Left THA and, at the end, the same procedure. Anesthetic dispersion and contrast were investigated. Elastomeric pump was installed with 0.1% bupivacaine (400 mL) at a rate of 14 mL.h⁻¹. The patient was transferred to the Intensive Care Unit (ICU). After 24 hour, a new pump was installed with the same solution. She did not receive any boluses for 50 hours. After removal of the catheter, pain was controlled with oral ketoprofen and dypirone.

Conclusions: Continuous peripheral blockade with infusion of 0.1% bupivacaine with elastomeric pumps is a safe and effective procedure in adults.

Keywords: Infusion Pumps; Anesthesia, Conduction; Lumbosacral plexus; Bupivacaine; Arthroplasty, Replacement, Hip.
Initially, the patient was placed in left lateral decubitus for right arthroplasty. At the end of the procedure, access to the lumbar plexus was achieved using a stimulator (HNS12 BBraun, Melsungen) connected to a 150-mm 18G Tuohy type needle (B.Braun Melsungen). The needle was advanced and the quadriceps was stimulated with a 0.5 mA current until a response was observed. After negative aspiration of blood, 20 mL of 0.2% bupivacaine were injected through the extension connector of the needle. Maintaining the needle in the same position, a 20G catheter was introduced 7 cm in the psoas compartment, being fixed in place with adhesive material and an occlusive dressing.

The patient was placed in the right lateral decubitus and left THA was initiated. Similarly, 20 mL of 0.2% bupivacaine were injected and a similar catheter was introduced.

At the end of the procedure, the patient was placed in the supine position. She recovered from the general anesthesia and was extubated. Approximately 20 mL of contrast (iohexol with 300 mg/mL-1 - Ominipaque®) were injected in both catheters to study the dispersion of the local anesthetic, and an anteroposterior X-ray of the psoas compartment was performed within one minute. Both catheters were in the psoas compartment (Figure 1). Before her discharge, a disposable elastomeric pump (Easypump®, B.Braun, Germany) containing 400 mL of 0.1% bupivacaine was connected to the catheters of both psoas compartments (Figure 2). The pump was programmed for infusion at a rate of 14 mL.h⁻¹. At the end, the patient was transferred to the Intensive Care Unit (ICU). She received instructions to trigger the bolus device, which is part of the pump, in case of severe pain. Toxicity symptoms of the local anesthetic were recorded. Twenty-four hours later, a new elastomeric pump with the same solution (volume, concentration, and rate of infusion) was installed, which remained for another 25 hours. During the 50 postoperative hours, boluses were not necessary. Both catheters were removed without intercurrences. After catheter removal, pain was controlled with oral ketoprofen and dypirone.

During the procedure, 1,500 mL of crystalloids, 500 mL of Voluven® (6% hydroxyethyl starch 130/0.4 in 0.9% saline), and two units of packed-red blood cells were administered. The urinary catheter drained 600 mL of urine during the procedure.

**DISCUSSION**

The use of bilateral lumbar catheters for bilateral THA has not been reported. Since it administers the local anesthetic close to the lumbar plexus, analgesia can be prolonged especially in patients undergoing THA. The results of this case demonstrate that elastomeric pump for CPNB with infusion of local anesthetic in adult patients is an effective and safe analgesia method after some large orthopedic procedures. The use of rescue analgesia was minimal.

The incidence of bilateral THA is a procedure that has been increasing, reducing hospitalization. During THA the patient can remain in lateral decubitus or supine depending on the preference of the surgeon (in this case, the patient was in lateral decubitus).

Psoas compartment block was the technique used for continuous analgesia. This blockade is performed due to the location of the psoas muscle at the level of the 4th and 5th lumbar vertebrae. The local anesthetic is deposited, blocking all lumbar plexus nerves and some roots of the sacral plexus. This approach is superior to the paravascular inguinal technique 2, especially due to the greater success in blocking the ilioinguinal, genitofemoral, lateral cutaneous femoral, and obturator nerves. For continuous analgesia, the posterior approach offers less chances of catheter dislocation when compared to the anterior approach, since the paravertebral muscle allows better fixation of the catheter 3. In a recent prospective
CONTINUOUS BILATERAL POSTERIOR LUMBAR PLEXUS BLOCK WITH A DISPOSABLE INFUSION PUMP. CASE REPORT

study evaluating the efficacy of continuous analgesia of the psoas compartment (0.2% ropivacaine at 0.15 mL·kg⁻¹·h⁻¹) after THA, a success rate of 97% in catheter placement and 94% of excellent postoperative analgesia, without the need of supplementation with systemic opioid were reported. Lido
caine, bupivacaine, and ropivacaine have been used as local anesthetics for continuous plexus analgesia, but bupivacaine and ropivacaine are used more often. The use of bupivacaine (0.1% to 0.25%) did not result in toxic blood levels in postoperative analgesia for 24 - 72 hours, the same dose of the present case. The venous level of bupivacaine during con

Continuous epidural analgesia can be a technical alternative for the treatment of pain after large orthopedic surgeries. Unlike the epidural block, psoas compartment block is considered limitative in cases of sympathectomy and, posteriorly, for eventual hemodynamic changes. Peripheral nerve blocks cause less nausea/vomiting and urinary retention than neuraxial blocks. Contraindications include infection at the site of the blockade and allergy to analgesics or anesthetics. The use of peripheral nerve blocks has been considered in patients on anticoagulants. However, its use in procedures, such as psoas compartment block, should be discussed due to the possibility of retroperitoneal hematoma.

Peripheral nerve block is a simple, safe, and effective technique for perioperative anesthesia and with the use of CPNB and a pump it provides excellent postoperative pain control. Continuous peripheral nerve block has been routinely indicated in some services; however, bilateral continuous psoas compartment block had not been reported yet. The extension of use of local anesthetics to control of postoperative pain has been reported in several countries, with several advantages over commonly used methods, including ease to manage, safe, low cost, and effective. We conclude that continuous bilateral peripheral nerve block with infusion of 0.1% bupiva
caine with elastomeric pump is a safe and effective procedure in adults.