CLINICAL INFORMATION

Continuous Bilateral TAP block in Patient with Prior Abdominal Surgery

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Abstract
We present as an option for epidural analgesia and intravenous opioid infusion a clinical case of transversus abdominis plane (TAP) block, with bilateral placement of catheter for postoperative analgesia after exploratory laparotomy performed in a patient with previous abdominal surgery and heart, kidney and liver failure.

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KEYWORDS
Abdominal Muscles; Analgesia; Intraoperative Period/ complications; Nerve Block; Postoperative Period

Introduction
Transversus abdominis plane (TAP) block has shown to be a promising and effective technique for intra- and postoperative analgesia of abdominal, urological, gynecological, and obstetric surgeries.

Since its first description in 2001 by Rafi and corroboration by McDonnell in 2004, multiple studies have emerged aiming at increasing the clinical applicability of the TAP block approach.

We present a case report in which a continuous bilateral TAP block was performed for postoperative analgesia of major abdominal surgery.

Clinical case
A male patient, aged 71 years, white, body mass index (BMI) of 20.76, was admitted with a clinical condition of intestinal obstruction and sepsis. The relevant features of patient’s history were congestive heart failure (CHF) of ischemic and hypertensive etiology, implanted pacemaker, stage III chronic kidney failure (CKF), liver transplant 21 years ago due to cirrhosis secondary to HBV infection, and hospitalization three months ago due to hepatic encephalopathy. Laboratory tests showed anemia (Hb-10.6 g.dL⁻¹), thrombocytopenia (69,000 platelets.μL⁻¹), and creatinine (2.13 mg.dL⁻¹).
We performed exploratory laparotomy with xiphopubic incision for Hartman’s procedure. We performed standard monitoring and balanced general anesthesia with propofol (200 mg), fentanyl (0.15 mg), and rocuronium (50 mg), and maintained with desflurane and nitrous oxide, uneventful.

Regarding analgesia, we administered intravenous (IV) paracetamol (1 g) and tramadol (100 mg). At the end of surgery, we performed bilateral, anterior, subcostal TAP block, ultrasound-guided, in an anatomical line conditioned by the previous and current surgery (Figs. 1, 2, and 3), with an 18-G Tuohy needle and introduced two 20-G epidural catheters (B. Braun Perifix), through which we bilaterally applied an initial bolus of 20 mL ropivacaine 0.5%. At the post-anesthesia care unit (PACU), we connected two elastomers with 5 mL.h⁻¹ ropivacaine 0.2% to catheters (Fig. 4). We combined this analgesia with paracetamol (1g every 6 hours), parecoxib (20 mg/IV every 12 hours), and rescue IV morphine (2 mg bolus, if numerical pain scale equal to or greater than four).

Figure 1 Tube position during TAP approach.

Figure 2 Ultrasound of the puncture region.

Figure 3 Needle entry into TAP and local anesthetic diffusion.

Figure 4 Patient monitoring at 48 hours.

Figure 5 Elastomers bilaterally connected to TAP catheters.
At the 24th and 48th hour (Fig. 5), the patient’s score for pain at rest and in motion was zero; he was hemodynamically stable and did not need rescue doses of morphine. After 48 hours we removed the catheters, the patient was discharged from PACU and transferred to the ward, having never reported pain.

**Discussion**

Pain control is an important and essential part of postoperative care and a decisive factor in recovering from any surgery. In our case, pain control assumed an even greater importance, given the patient’s heart condition. We know that postoperative pain, particularly if poorly controlled, may cause sympathetic nervous system (SNS) activation, which is responsible for coronary vasoconstriction, tachycardia, and increased oxygen consumption, which may lead to ischemia or infarction.

Literature describes two standard analgesic options for patients undergoing major abdominal surgery: IV opioids and epidural analgesia. Although IV opioids provide good analgesia at rest (static analgesia), they are not as effective in controlling pain in motion (dynamic analgesia). Moreover, they are associated with side effects (nausea, vomiting, sedation, paralytic ileus, respiratory depression), with particular importance for liver and kidney diseases, as in the case described here. Both liver and kidney failure produce change in the pharmacokinetics of opioids, particularly morphine, and may precipitate the onset of these adverse effects by the accumulation of active metabolites. However, epidural analgesia has been considered the gold standard in controlling pain after surgery involving abdominal wall incisions, despite the contraindications, potential risks, and failure rate described (17% to 37%). Our patient had contraindications: sepsis (relative) and thrombocytopenia (absolute) worsened by the likelihood of multipuncture. There is no study in literature ensuring the safety of neuraxial block to platelet counts below 80,000/μL. Therefore, we did not perform epidural analgesia in our patient.

To date, no TAP block has proved superior to intrathecal morphine or epidural analgesia, but it is considered a valid alternative to intrathecal analgesia. In the case reported here, the patient’s clinical condition and previous abdominal surgery led us to perform a TAP block using an approach not yet reported, which resulted in analgesia at T6-L1 dermatome level, without the use of rescue analgesia. This particular patient’s history of liver transplantation with a bilaterial subcostal incision may have influenced the abdominal wall’s decreased sensitivity. Furthermore, we do not know the real diffusion of local anesthetics (LA). Contrasting studies have shown that the posterior TAP block allow the LA diffusion into the paravertebral space and, therefore, the analgesic effect may be greater than expected regarding dermatomes, visceral analgesia, and duration. In the case reported here, the possible presence of adhesions between abdominal wall muscle planes may have forced LA dispersal to inferior and posterior planes. It is also important to assess the ideal concentration and volume for bolus and infusion and proper placement of the catheter within TAP.

Although there are doubts regarding TAP block, the technique is easily applied and has an excellent safety profile with any approach, which may encourage its practice. There are only two case reports of liver puncture. Although toxic plasma concentrations of LA have been detected, there are no reports of clinical signs of systemic toxicity associated with LA.

Absolute contraindications for TAP block include patient refusal, abdominal wall infection, and abnormality at the puncture site. To date, there is no evidence that coagulation disorders are contraindications for the use of this technique.

TAP block is an important component of a multimodal analgesia. Its clinical indication as part of a combined anesthetic/analgesic technique is increasingly accepted.

TAP block has weak points when used alone and in single administration. However, if the technique is associated with continuous intravenous analgesics it is connected to lower pain scores, reduced opioid consumption with reduced nausea and vomiting after surgery, early ambulation and hospital discharge. However, more studies are needed to increase this technique’s accuracy.

In the case reported here, the patient’s clinical condition and previous abdominal surgery led us to perform a TAP block using an approach not yet reported, which resulted in clinical success.

**Conflicts of interest**

The authors declare no conflicts of interest.
References