

A New Opioid Free Postoperative Pain Relief Technique for Pediatric Laparoscopic Appendectomy: Erector Spinae Plane Block

Pediatric Laparoskopik Apendektomide Opioidsiz Postoperatif Ağrı Tedavisinde Yeni Bir Teknik: Erektör Spinae Plan Bloğu

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Öz

Erektör spinae plan bloğu (ESPB) yeni tanımlanmış interfasyal bloktur ve özellikle postoperatif analjezi için uygulanmaktadır. Literatürde değişik endikasyonlarda kullanılmaktadır. Erektör spinae alan bloğu uygulandığında lokal anestezipler multilevel yayılım göstermektedir. Tek enjeksiyon ile multilevel analjezi sağlanabildiği için avantaj yaratmaktadır. Pediatric hastalardaki laparoskopik apendektomi cerrahisinde erektör spinae alan bloğu postoperatif opioidsiz ağrı tedavisi için uygun bir seçenek olabilir.

Anahtar Kelimeler: Erektör Spinae Alan Bloğu, Laparoskopik Apendektomi, Postoperatif Analjezi, Pediatric Hasta

Abstract

Erector spinae plane block (ESPB) is a new interfascial block and especially utilizing for postoperative analgesia. In literature it has different indications. Local anesthetics can spread multilevels in erector spinae plane. This gives advantage about one injection and multilevel analgesia. Erector spinae plane block can be a good choice for postoperative opioid free pain relief of laparoscopic appendectomy surgeries in pediatric patients.

Keywords: Erector Spinae Plane Block, Laparoscopic Appendectomy, Postoperative Analgesia, Pediatric Patient

Introduction

Postoperative pain relief in pediatric patients is important since they cannot express themselves well enough. Oral and rectal administration of nonopioid drugs and regional anesthesia play a crucial role since they are available in most places (1). Good use of these modalities has an important opioid-sparing effect (2).

Although opioids are commonly used for postoperative analgesia they have some side effects. The use of regional anesthesia in the pediatric population has increased over the last decade as it offers several potential advantages in the provision of postoperative analgesia including a reduction in parenteral opioids, decreased exposure to general anesthetic agents, and shortened hospital length of stay (3,4). Regional analgesia continues to evolve with the introduction of ultrasound-guided fascial plane blocks.

The ESPB is a novel technique targeting the ventral rami, dorsal rami, and rami communicantes

of the spinal nerves. After injection, the local anesthetic agent was shown to extend cranially and caudally over several dermatomal levels. ESPB is utilizing for postoperative analgesia in different adult and pediatric surgeries (5–7).

Case

A parental written consent was obtained for each patient for the block procedure. Also a different written consent was obtained from parents of each patient about publication of the case.

After the induction of general endotracheal anesthesia, the patients was positioned in the left lateral decubitus position a high frequency linear ultrasound probe was placed. After allowing transvers processes at T11 and T12 levels the esp block with 0.5 ml/kg 0.25 bupivacain was done at T11 for two patients and it was done at T12 level for three patients (Figure 1 and 2). A 20 G Tuohy needle was inserted in plane with caudal to cephalad approach to beneath the erector spinae muscles plane.

After the application of ESPB the patient was brought back to the supine position and then was given permission to beginning of surgery. 10 mg/kg paracetamol was given intravenously. There was not any remarkable event in the duration of operations.

The patients were evaluated with The Face Legs Activity Cry Consolability (FLACC) Scale which was developed by the Department of Anesthesiology, University of Michigan Medical School and Health Systems. The FLACC Scale is a behavioral scale for scoring postoperative pain in

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Table 1. Age, level of block, time of surgery and FLACC scores of patients

Age	Level of ESP block	Time of surgery (minutes)	FLACC 5.min	FLACC 15.min	FLACC 1.hour	FLACC 6.hours	FLACC 12.hours	Additional analgesic
2	T11	65	2	0	0	0	0	0
9	T11	50	1	0	1	0	0	0
6	T12	55	0	1	0	0	0	0
4	T12	60	0	0	0	0	0	0
4	T12	70	1	0	0	1	0	0

children between the ages of two months and seven years or in persons unable to communicate. The evaluation of patients was done at 5. and 15. minutes in recovery room and at 1., 6. and 12. hours in ward. The results of evaluations were shown in Table 1.

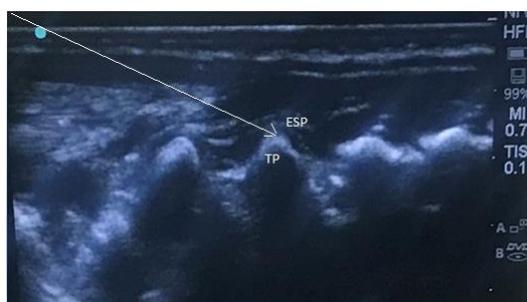


Figure 1. The linear ultrasound view for ESPB
Arrow: The pathway of needle; TP: The transvers process of vertebrae; ESP: The Erector Spinae Muscle



Figure 2. The photo of Erector Spinae Plane Block procedure

Discussion

Postoperative effective analgesia should be planned for pediatric patients. Small children may become more severely agitated, since they are more dependent on their parents, have a lower tolerance for fasting, less flexibility with strange settings, and a lower pain threshold. One of the most important causes of postoperative agitation is pain (8).

A study published in 2008 of 12.739 surgical inpatients noted a correlation between persistent perioperative opioid use following surgical procedures and mortality (9). For this multimodal analgesia is recommending for postoperative analgesia.

Caudal anesthesia/analgesia is one of the part of multimodal analgesia in children. It is the most

popular regional blocks in children and is efficacious for postoperative analgesia for infraumbilical procedures (10). Caudal anesthesia has some side effects and complications. These are total spinal anesthesia, urinary retention, epidural abscess, epidural hematoma and paraplegia (11,12).

Erector Spinae Plane Block is a new block and mechanical complications are rare as local anesthesia application is performed distant to any nerve or vital organ (13). It is recommended a part of postoperative multimodal analgesia in pediatric patients for decreasing opioid consumption (14). It has showed by cadaveric studies (15) and clinic studies (16) local anesthetics can spread in erector spinae plane fascia. We are reporting here that single shot ESPB can be used for opioid free pain relief in laparoscopic appendectomy surgery.

The ESPB is mainly use for lower abdominal surgeries in pediatric patients. ESPB is an interfascial block and local anesthetics can be spread to the paravertebral and epidural space. In a study (17) was shown that the ESPB is effective for several indications from T2 vertebral level to L1 level.

Our cases seem to be a new indication for postoperative analgesia by ESPB.

The paravertebral block (18) at T12-L1 level and transverses abdominis plane (TAP) block (19) can be utilized in pediatric appendectomy surgeries. The FLACC scores and rescue analgesic and total opioid consumption showed that ESPB can solve the pain problem of pediatric patients after appendectomy.

We decided to apply ESPB as the paravertebral block would insufficient for analgesia in port hole region. The analgesia plan has to solve the pain from surgery and port hole region and the visceral pain. The ESPB can provide visceral analgesia and can spread in caudal and cephalad regions (20).

In conclusion single shot ESPB at T11 or T12 levels can be an alternative effective choice for postoperative opioid free pain treatment in pediatric laparoscopic appendectomy surgeries.

Written consent: Written consents of the patients were obtained on 07.10.2019, 16.10.2019, 24.10.2019, 01.11.2019 and 08.11.2019.

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