Received: December 18, 2022
Accepted: February 19, 2023

Acad Med J 2023;3(1):124-127
UDC: 616.381-007.43-089.819
www.doi.org/10.53582/AMJ2331124t
Case report

EFFECT OF BILATERAL ERECTOR SPINAE PLANE (ESP) BLOCK ON PAIN AFTER LAPAROSCOPIC VENTRAL HERNIA REPAIR: A CASE SERIES

Toleska Marija[1], Dimitrovski Aleksandar[1], Naumovski Filip[1], Trposka Angela[1], Panoska Avramovska Aleksandra[2], Toleska Dimitrovska Natasha[3]

[1]University Clinic for TOARILUC, Department of Anesthesiology, Reanimation and Intensive Care, Ss. Cyril and Methodius University in Skopje, Faculty of Medicine in Skopje, Republic of North Macedonia
[2]University Clinic for Gynecology and Obstetrics, Ss. Cyril and Methodius University in Skopje, Faculty of Medicine in Skopje, Republic of North Macedonia
[3]University Clinic for Thoracic and Vascular Surgery, Ss. Cyril and Methodius University in Skopje, Faculty of Medicine in Skopje, Republic of North Macedonia
e-mail: marija_toleska@yahoo.com

Abstract

Laparoscopic ventral hernia repair (LVHR) operations are followed by moderate postoperative pain, shorter recovery periods and less surgical complications such as seroma, hemorrhage, intestinal injury, mesh infection and recurrence. Pain after LVHR sometimes can be severe and last more than one week up to one month. Erector spinae plane (ESP) block is inter-fascial plane block and performed bilaterally can provide a good visceral and somatic analgesia for various abdominal surgeries. We describe five cases of laparoscopic ventral hernia repair who received bilateral ESP block prior to induction to general anesthesia and its effective analgesic effect was seen in the intra- and postoperative period. Our results showed that bilateral ESP block performed before the induction to general anesthesia provided a good analgesia and low opioid consumption in the intraoperative period, low pain scores in the first 48 hours and no need of rescue analgesia after laparoscopic ventral hernia repair surgery.

Keywords: erector spinae plane block, laparoscopy, ventral hernia repair, postoperative pain

Introduction

Ventral hernia is defined as a protrusion of abdominal contents through a defect or a weakness in the abdominal wall[1]. There are different types of ventral hernia: umbilical, hiatal, epigastric and incisional hernia. Incisional hernia is defined as a protrusion around or directly along a prior abdominal surgical incision. They are well known like secondary ventral hernias that occur after surgery[2]. Abdominal wall hernias occur with an incidence of 10-30%[3], and can be managed with open or laparoscopic surgery. Laparoscopic ventral hernia repair (LVHR) is associated with reduced postoperative pain and can shorten hospital stay[2]. Pain after LVHR surgery can be moderate one week after operation. We present three case reports where we used bilateral erector spinae plane block (ESPB) for postoperative analgesia in patients scheduled for LVHR.

Case series:

Case 1: A 52-year-old female patient (weight 78 kg, height 180 cm) was scheduled for laparoscopic operation of incisional hernia after laparotomy. Before induction to general anesthesia, she received bilateral ESP block performed at level of Th 9 with 20 ml 0.25% bupivacaine on both sides. Introduction to general anesthesia consisted of dexamethasone 4 mg, midazolam 0.04 mg/kg, lidocaine 1 mg/kg, fentanyl 2 μg/kg, propofol 2 mg/kg and rocuronium bromide 0.6 mg/kg.

Anesthesia was maintained with sevoflurane (MAC 0.7-1%) and additional bolus doses of fentanyl. The total amount of fentanyl given during surgery was 200 μg and surgery lasted around 120 minutes. At the end of the surgery, the patient received 1 gr metamizole and in the postoperative period Visual Analog Score (VAS) Scale was used in the first 48 hours. For pain scores 4-6/10 1 gr paracetamol was given and for pain scores 7-10/10 tramadol 1 mg/kg was given. As a rescue analgesia was used 1 gr metamizole on demand. VAS score 2 h after surgery was 2 at rest and 3 on coughing, 8 h after surgery – 3 at rest and on coughing, 12 h after surgery – 4 at rest and 5 on coughing and 1 gr paracetamol was given. After 24 h and 36 h, pain was 5 at rest and 6 on coughing and 1 gr paracetamol was given. After 48 h, pain was 3/10 at rest and on coughing.

Case 2: A 58-year-old male patient (weight 90 kg, height 182 cm) was scheduled for LVHR because of incisional hernia after previous open cholecystectomy. Prior to surgery he received bilateral ESP block at level of Th 8 with 20 ml 0.25% bupivacaine. Introduction to general anesthesia consisted of giving dexamethasone 4 mg, midazolam 0.04 mg/kg, lidocaine 1 mg/kg, fentanyl 2 μg/kg, propofol 2 mg/kg and rocuronium bromide 0.6 mg/kg. The total amount of fentanyl given during surgery was 250 μg. Two hours after surgery he complained of pain 3 on VAS score at rest and on coughing, but after 8 h pain was higher, 5 at rest and 6 on coughing and 1 gr paracetamol was given. After 12 h, pain was 3-4/10 at rest and on coughing. After 24 h, 36 h and 48 h, pain scores were 3-4 at rest and 4 at coughing and 1 gr paracetamol was given.

Case 3: A 61-year-old male patient (weight 88 kg, height 178 cm) underwent LVHR and his previous operation was laparotomy due to colon carcinoma. Bilateral ESP block was done at level Th 9 with 20 ml 0.25% bupivacaine and introduction to general anesthesia consisted of giving dexamethasone 4 mg, midazolam 0.04 mg/kg, lidocaine 1 mg/kg, fentanyl 2 μg/kg, propofol 2 mg/kg and rocuronium bromide 0.6 mg/kg The total amount of fentanyl given during surgery was 200 μg. Two hours after surgery he complained of pain 1-2/10 at rest and 2-3/10 on coughing. After 8 h pain, pain was 2-3/10 at rest and on coughing. Twelve hours after surgery, he complained of having pain 5 at rest and on coughing and 1 gr paracetamol was given. After 24 hours, pain was 6 at rest and on coughing and 1 gr paracetamol was given. In the last two time points for measurement of pain (36 and 48 h after surgery) the patient complained of pain 3-4/10 at rest and on coughing and 1 gr paracetamol was given.

Case 4: A 55-year-old female patient (weight 60 kg, height 170 cm) underwent LVHR after previous emergency laparotomy. Bilateral ESP block was done at level Th 10 with 20 ml 0.25% bupivacaine and introduction to general anesthesia consisted of giving dexamethasone 4 mg, midazolam 0.04 mg/kg, lidocaine 1 mg/kg, fentanyl 2 μg/kg, propofol 2 mg/kg and rocuronium bromide 0.6 mg/kg. Total amount of fentanyl given during surgery was 150 μgr. Two hours after surgery, she complained of pain 2/10 at rest and 2/10 on coughing. After 8 h, pain was 2/10 at rest and on coughing. Twelve hours after surgery, he complained of having pain 4 at rest and on coughing and 1 gr paracetamol was given. After

24 hours, pain was 5 at rest and on coughing and 1 gr paracetamol was given. In the last two time points for measurement of pain (36 and 48 h after surgery) the patient complained of pain 3/10 at rest and on coughing and 1 gr paracetamol was given.

Case 5: A 48-year-old male patient (weight 83 kg, height 180 cm) underwent LVHR because of incisional hernia after previous open cholecystectomy and laparotomy due to colon carcinoma. Bilateral ESP block was done at level Th 9 with 20 ml 0.25% bupivacaine and introduction to general anesthesia consisted of giving dexamethasone 4 mg, midazolam 0.04 mg/kg, lidocaine 1 mg/kg, fentanyl 2 μg/kg, propofol 2 mg/kg and rocuronium bromide 0.6 mg/kg. Total amount of fentanyl during surgery was 200 μgr. Two hours after surgery, he complained of pain 2/10 at rest and 3/10 on coughing. After 8 h, pain was 3/10 at rest and on coughing. Twelve hours after surgery, he complained of having pain 4/10 at rest and on coughing and 1 gr paracetamol was given. After 24 hours, pain was 4/10 at rest and on coughing and 1 gr paracetamol was given. In the last two time points for measurement of pain (36 and 48 h after surgery) the patient complained of pain 3/10 at rest and on coughing and 1 gr paracetamol was given.

Discussion

Erector spinae plane block is regional anesthesia technique and inter-fascial plane block where local anaesthetic is injected between the erector spinae muscle and the transverse process. The local anesthetic is affecting ventral and dorsal rami of the thoracic spinal nerves and rami communicants by spreading into the paravertebral space cranially and caudally[4]. It can provide a good visceral and somatic analgesia for various abdominal surgeries[5,6]. Pain during LVHR operations can be of visceral and somatic origin and bilateral ESP block has been shown ideal variant to lower opioid requirements during and after surgery and lower VAS scores in the postoperative period.

In our case series, we noticed that total amount of fentanyl given during operation was low due to analgesic effect of bilateral ESP block. In the postoperative period, none of the patients requested opioids, nor need for rescue analgesic and also in the first 48 hours VAS scores were low. After 48 hours, they were discharged from hospital without any complications. In the follow-up period of 1 month, none of the patients complained of having pain or surgical complications.

Laparoscopic ventral hernia repair operations compared to open ones are associated with less complications such as postoperative pain, less surgical site infections, less seroma and hemorrhage and shorter hospital stay[7]. Also, they can be followed with severe postoperative pain, sometimes from entrapped intercostal nerves within the transabdominal sutures and mesh or from muscle ischemia and can lead to patients' discomfort and longer stay in hospital[8].

In the literature, there are many articles that describe the effect of ESP block in laparoscopic cholecystectomy, but we could not find any article related to the analgesic effect of ESP block on pain after LVHR surgery. Its analgesic effect was shown in breast surgery[9] and was successfully used as a sole anesthetic technique in patients with many comorbidities[10].

Conclusion

Bilateral erector spinae plane block performed prior to induction to general anesthesia provides good analgesia, low opioid consumption in the intraoperative period, low pain scores in the first 48 hours after surgery and no need of rescue analgesia after laparoscopic ventral hernia repair surgery. In the follow-up period of 1 month, none of the patients complained of having pain or surgical complications.

Conflict of interest statement. None declared.

References

1. Petro CC, O'Rourke CP, Posielski NM, Criss CN, Raigani S, Prabhu AS, *et al*. Designing a ventral hernia staging system. *Hernia* 2016; 20(1): 111-117. doi: 10.1007/s10029-015-1418-x.
2. Pereira C, Rai R. Open Versus Laparoscopic Ventral Hernia Repair: A Randomized Clinical Trial. *Cureus* 2021; 13(12): e20490. doi: 10.7759/cureus.20490.
3. Stabilini C, Cavallaro G, Dolce P, Capoccia Giovannini S, Corcione F, Frascio M, et al. Pooled data analysis of primary ventral (PVH) and incisional hernia (IH) repair is no more acceptable: results of a systematic review and metanalysis of current literature. *Hernia* 2019; 23(5): 831-845. doi: 10.1007/s10029-019-02033-4.
4. Forero M, Adhikary SD, Lopez H, Tsui C, Chin KJ. The erector spinae block: A novel analgesic technique in thoracic neuropathic pain. *Reg Anesth Pain Med* 2016; 41: 621-627. doi: 10.1097/AAP.0000000000000451.
5. Tulgar S, Selvi O, Senturk O, Serifsoy TE, Thomas DT. Ultrasound-guided erector spinae plane block: Indications, complications, and effects on acute and chronic pain based on a single-center experience. *Cureus* 2019; 11(1): e3815. doi: 10.7759/cureus.3815.
6. Toleska M, Dimitrovski A. Erector spinae plane block in various abdominal surgeries: A case series. *Saudi J Anaesth* 2020; 14: 528-530. doi: 10.4103/sja.SJA_31_20.
7. Piccoli M, Pecchini F, Vetrone G, Linguerri R, Sarro G, Rivolta U, *et al*. Predictive factors of recurrence for laparoscopic repair of primary and incisional ventral hernias with single mesh from a multicenter study. *Sci REP* 2022; 12: 4215. https://doi.org/10.1038/s41598-022-08024-3.
8. Lindström P, Rietz G, Everhov ÅH and Sandblom G. Postoperative Pain After Robot-Assisted Laparoscopic Ventral Hernia Repair. *Front Surg* 2021; 8: 724026. doi: 10.3389/fsurg.2021.724026.
9. Thiagarajan P, Thota RS, Divatia JV. Efficacy of ultrasound-guided erector spinae plane block following breast surgery - A double-blinded randomised, controlled study. *Indian J Anaesth* 2021; 65(5): 377-382. doi: 10.4103/ija.IJA_1426_20.
10. Sundararajan M, Srinivasan P. Erector spinae plane block as a sole anaesthetic technique for simple mastectomy in a cardiorespiratory crippled female. *Indian J Anaesth* 2020; 64(1): 77-79. doi: 10.4103/ija.IJA_362_19.