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Original Article

Efficacy of ultrasound-guided bilateral erector spinae plane block for postoperative analgesia in laparoscopic sleeve gastrectomy. A retrospective cohort study

Omer Karaca[1], Yilmaz Polat[2]

[1]Department of Anesthesiology and Reanimation, Private Konya Anit Hospital, Konya, Turkey
[2]Department of General Surgery, Private Konya Anit Hospital, Konya, Turkey

Abstract

Aim: Laparoscopic sleeve gastrectomy (LSG) causes moderate to severe pain. The present study was planned to evaluate the efficacy and safety of bilateral erector spinae plane block (ESPB) under ultrasound.

Material and Methods: A total of 38 patients who underwent LSG between November 2018 and Januvary 2020 were retrospectively analyzed. Patients were divided into two groups: The Control Group (group c, n=19) received only an intravenous (iv) patient controlled analgesia (PCA) and the ESPB Group (group E, n=19) received bilateral ESPB (bupivacaine 0.25, 50 ml) and iv PCA.

Results: The numeric rating scores (NRS) at 20th min, 40th min, 1st, 2nd, 4th, 6th, 8th, 12th and 36th hour at the passive period were higher in Group C than in Group E (p<0.0001 each). 24th,48th and 72nd hour NRS scores at the passive period were also higher in group C than in group E (respectively, p=0.0001, p:0.0003, p=0.01). 20th min, 40th min, 1st, 2nd, 6th, 8th, 12th, 24th and 36th hour NRS scores at the active period were also higher in Group C than in Group E (p<0.0001 each). 4th, 48th and 72nd hour NRS scores at the active period were higher in Group C than in Group E (respectively, p<0.0001, p<0.0001, p=0.0002). The fentanyl consumption at all the periods were lower in the Group E (p<0.0001). PACU and hospital stay durations were shorter in the Group E (p<0.0001). Intraoperative fentanyl requirement was lower in the Group E (p=0.003). The first analgesic need time was later in group E (p=0.017). The unassisted walking time was shorter in the Group E (p<0.0001). The rescue analgesic requirement was lower in the Group E (p<0.0001). The PACU and hospital stays were shorter in group E (p<0.0001). No block-related complications and opioid-related side effects were encountered.

Conclusion: Pre-incisional bilateral ultrasound guided ESPB provide superior analgesia and shortens unassisted walking time and hospital stay after LSG.

Keywords: Analgesia; erector spinae plane block; laparoscopic sleeve gastrectomy; postoperative pain; walking time

INTRODUCTION

Laparoscopic Sleeve Gastrectomy (LSG) described as resection of more than 80% of the stomach (1), which allows the gastric canal to remain in a volume of 100-150 ml, although it is a minimal surgical procedure, anterior abdominal wall incisions cause significant pain (2). In addition, the pain is stronger due to the increased number of trocars and maneuvers for intraoperative intervention for increased body mass index (BMI) (3). Morbid obesity (MO) patients exposed to LSG have both prolonged recovery period and extraordinary struggle in pain control due to opioid-derived analgesics in one hand and to their comorbid status on the other hand (4). In addition, the difficulty in respiratory effort is aggregated by adding the side effects of sedative analgesics which is present in most morbid obese patients for the negative effect of obstructive sleep apnea on breathing (5). In addition, insufficient pain control delays patient mobilization in the postoperative period, thereby causing aggregate of cardiovascular, pulmonary and thromboembolic events that could potentially be avoided. Pain control of MO patients is still a very important issue in terms of patient safety and possible risks (6).

Multimodal analgesia is recommended as a part of Enhanced Recovery After Surgery (ERAS) programs to reduce potential problems associated with narcotic use in MO patients (7). Multimodal analgesia involves the use of two or more agents with different mechanisms of action for maximum analgesic efficacy, thereby reducing the risk of side effects in the postoperative period. Regional anesthesia applications are also included in many clinical applications as part of multimodal analgesia.

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Corresponding Author: Omer Karaca, Department of Anesthesiology and Reanimation, Private Konya Anit Hospital, Konya, Turkey
E-mail: dromerkaraca@hotmail.com

Erector spinae plane block (ESPB) is a regional analgesia method defined by blocking the dorsal and ventral rami. In this block method, local anesthesia injection is targeted to the interfacial area between the transverse process and the erector spinae muscle. ESPB is a suitable regional anesthesia method, which has been recently described and has demonstrated postoperative analgesia in various operations including thoracic and abdominal because of blocking both somatic and visceral pain (8,9). Although the effects of ESPB on postoperative pain in many operations have been investigated in the literature, we have not found any clinical study investigating the effect of bilateral ESPB application on LSG. Therefore, we believe that our study was the first retrospective clinical study.

Our hypothesis was that ultrasound-guided pre-incision bilateral ESPB application would provide superior postoperative analgesia after laparoscopic sleeve gastrectomy compared to general anaesthesia. For this purpose, it was planned to investigate the postoperative opioid consumption, numeric rating scale (NRS) pain scores, the intra-operative opioid requirement, first rescue analgesic need time, unassisted walking time, stay in post-anesthesia care unit (PACU) and hospital discharge times, opioid related side effects, and block related complications.

MATERIAL and METHODS

The study protocol was approved by the KTO Karatay University Ethics Committee (decision number 2020/003). In addition, this study was conducted in accordance with the principles of the Declaration of Helsinki. As soon as the local ethics committee gave approval, the patient files were reviewed. A total of 38 patients who underwent LSG between November 2018 and January 2020 were retrospectively analyzed. Prospectively collected datas were retrospectively analyzed. Those patients who were deemed eligible to participate in the study were called to the hospital to obtain written informed consent. A written informed consent form was obtained from each patient who was included to the study. Those patients between 18 and 65 years old who were in American Society of Anesthesiologists (ASA) classes I–III and underwent LSG. The exclusion criteria were as follows: a previous history of opioid use preoperatively, repeats surgery, a conversion to open surgery, an allergy to local anesthetics, urgent surgery, the presence of any systemic infection, pregnancy, and regional anesthesia other than an ESPB.

Patients whose age, gender, height, body weight, body mass index (BMI) and ASA groups were recorded and divided into two groups. The Control Group (Group C, n=19) received only intravenous (iv) patient controlled analgesia (PCA) and the ESPB Group (Group E, n=19) received bilateral ESPB (bupivacaine % 0.25, 50 ml) and iv PCA. When patients in each group were taken into the operating room, standard monitoring was performed, including electrocardiography (ECG), peripheral oxygen saturation (SpO2) and non-invasive blood pressure (NIBP) measurements. Following endotracheal intubation, 2% sevoflurane in 40% oxygen and 60% air and1 µg / kg / min iv remifentanil infusion were applied for anesthesia maintenance. If mean heart rate and blood pressure during the surgical period was above 20% of baseline value, iv 1 µg / kg fentanyl was administered and recorded as additional analgesia. In addition, pulse, blood pressure and SpO2 were followed during the surgery. The patients were taken to the post-anesthesia care unit (PACU) after the extubation. When the patients obtained the least 10 points on the Aldrete's scoring system, they were shifted to the ward.

Block Procedure

When the patients in Group E were taken to the operation room, they were brought to the prone position before general anesthesia after standard monitoring and IV intravenous saline delivery. The lower boundaries of the scapula were marked and the 7th thoracic vertebra level was determined, and the thorax region was cleaned with povidone-iodine to be sterile. 5-13 MHz linear ultrasound probe (Fujifilm SonoSite, WA, USA) covered with sterile sheath was placed on the spinous process of the T7 vertebra in the sagittal plane. Then, the probe was advanced 2.5-3 cm lateral in to the parasagittal plane. After seeing the Trapezius, Rhomboid Major, Erector Spinae muscle and the transverse process of the T7 vertebra, the 22-gauge 10 cm stimuplex needle (Stimuplex A, B Braun, Melsungen, Germany) was advanced through the cranial to caudal transverse process of the T7 vertebra with in-plane method. When the tip of the needle was on the fascia of the anterior (deep) surface of the Erector Spina muscle, 25 ml of 0.25% bupivacaine was injected after hydrodissection with 0.5-1 ml of saline (Figure 1). This process was then applied to the other side with the same procedure. After the block procedure, the patients were converted to supine position and a general anesthesia protocol was displayed.

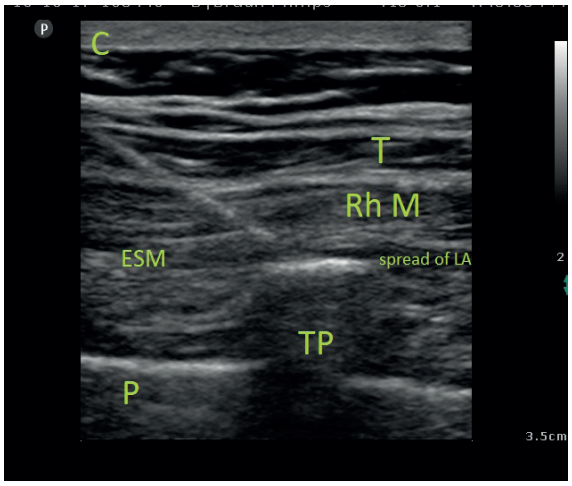


Figure 1. Scanning ultrasonogram demonstrating Trapezius (T), Rhomboid Major (Rh M) and Erector Spinae Muscle (ESM), Pleura (P), T7 transverse process (TP), Needle (N) and spread of local anesthetic (LA). Erector spinae plane block performs at level of T7 transverse process. The needle inserts with in-plane technique cephal to caudal and the tip of needle contacts the TP. Then local anesthetic (LA) injects into the fascial plane between ESM and TP.

Postoperative Pain Management

Patients in both groups were given 1 g paracetamol and 20 mg tenoxicam 30 minutes before the end of the surgery. When they were taken to PACU, tramadol Patient Controlled Analgesia (PCA), which was prepared to have 3mg / ml, 15mg bolus and 20 minutes lock-up time without basal infusion was attached to all patients. Pain levels during rest and movement at 20th, 40th minutes and 1st, 2nd, 4th, 6th, 8th, 12th, 24th, 36th, 48th and 72nd hours were evaluated using 11-point Numeric Rating Scala (NRS= 0: no pain, 10: most severe pain). Active movement was defined as moving from a lying to a sitting position. When NRS> 3/10, 25 mg of meperidine HCl IV was administered. Analgesia in the ward was determined as 1 g paracetamol every eight hours. Paracetamol dose was skipped if NRS <2 and / or patient refused. PCA tramadol usage amounts were recorded as amounts consumed in the intervals of 0-6th, 6-12th, 12-24th, 24-36th, 36-48th and 48-72nd hours.

Opioid related sedation was evaluated according to the Ramsey Sedation Scale (RSS). The intraoperative opioid requirement, the first analgesic need time, NRS pain scores, rescue analgesia requirement, unassisted walking time, PACU stay, and hospital discharge times were recorded. In addition to ESPB related complications, opioid related side effects such as headache, dry mouth, itching, nausea and vomiting were also recorded. The first analgesic need time was determined as time when the rescue analgesic was first applied. PONV was evaluated using a 4-point numerical scale (0 = no PONV, 1 = mild nausea, 2 = severe nausea or vomiting once, and 3 = vomiting more than once). If PONV score was ≥ 2, the antiemetic ondansetron at 0.1 mg/kg was intravenously administered. Moreover, patients were discharged from the hospital based on the protocols followed by the surgical team, which included a pain score of <3 without meperidine as well as PONV and sedation scores of 0.

Statistical Analyses

The descriptive statistics, such as the mean, standard deviation (SD), frequency, and percentage were given for the continuous and nominal variables, where appropriate. T-tests, Mann Whitney U and chi-squared or Fisher's exact tests were used when comparing a variable among two groups. Mixed effects models were used to analyze the time and group effects on the main outcomes of the study. The analyses were performed using SAS University Edition 9.4 (SAS Institute Inc., Carey, NC, USA). A p value of < 0.05 was considered to be significant.

RESULTS

The patients eligible for this study were analyzed, and the results have been presented in a Consolidated Standards of Reporting Trials flow diagram (Figure 2). The groups were comparable with respect to the age, weight, height, BMI, sex, ASA status, operative time, and anesthesia time. Height was higher in Group C than Group E (mean± SD: 167.6±4.5 cm vs. 160.5±11.5, respectively, p=0.016). BMI was lower in Group C than Group E (mean± SD: 43.6±3.3 vs.48.3±9.2, respectively, p=0.043) (Table 1).

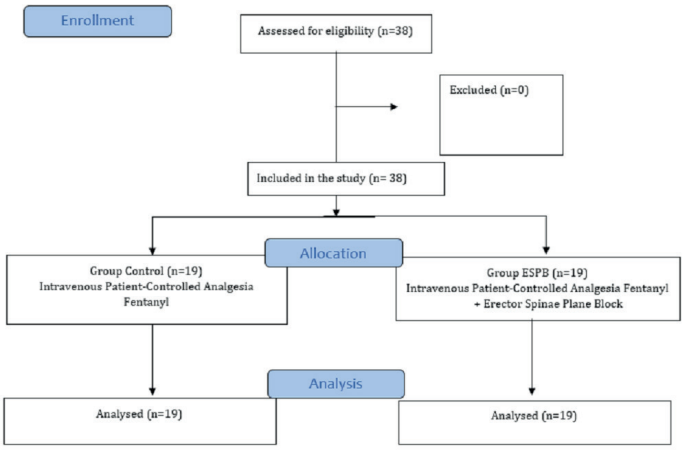


Figure 2. Flow chart of the study.

Table 1. Demographic characteristic of study patients

	Group C (n=19)	Group E (n=19)	P
Age, yr	37.4 ± 6.9	33.9 ± 7.1	0.141[a]
Weight, kg	122.7 ± 11.9	122.37 ± 9.7	0.917[a]
Height, cm	167.6 ± 4.5	160.5 ± 11.5	0.016a*
BMI, kg m^{-2}	43.6 ± 3.3	48.3 ± 9.2	0.043a*
ASA status (I/II/III)	6/10/3	8/1/10	0.003b*
Sex (F/M)	13/6	8/11	0.100[b]
Duration of surgery, min	218.9 ± 23.5	227.9 ± 22.7	0.241[a]
Duration of anaesthesia, min	233.2 ± 23.3	241.8 ± 20.6	0.232[a]

Values are presented as number or mean ± standart deviation. ASA=American Society of Anesthesiologists. BMI=Body Mass Index [a] Independent sample t test; [b] Chi-square test; * P<0.05 is statistically significant

The total fentanyl consumption during the 72-hour period was higher in group C than in group E (mean±SD: 633.9±57.6 µg vs. 236.1±154.3 µg, respectively, p<0.0001) (Table 2). The intraoperative fentanyl requirement was higher in group C than in group E (63.2% vs. 15.8%, respectively, p=0.003). The rescue analgesia requirement was higher in group C than in group E (68.4% vs. 5.3%, respectively, p<0.0001). The first analgesic need time was earlier in group C than in group E (mean±SD: 98.5±24.8 min vs. 146±53.1 min, respectively, p=0.017). The unassisted walking time was later in group C than in group E (mean±SD: 219.5±32.9 min vs. 172.9±8.5 min, respectively, p<0.0001). The PACU stay and hospital stay were longer in group C than in group E (mean±SD: 27.1±2.2 min vs. 18.3±2 min and 81.2±6.4 hours vs. 72 hours, respectively, p<0.0001) (Table 3).

20th min, 40th min, 1st, 2nd, 4th, 6th, 8th, 12th and 36th hour NRS scores at the passive period were higher in Group C than in Group E (p<0.0001 each). 24th, 48th and 72nd hour NRS scores at the passive period were also higher in group C than in group E (mean±SD: 1±0.9 vs. 0.2±0.6, 0.5±0.5 vs. 0, 0.2±0.4 vs. 0, respectively, p=0.0001, p:0.0003, p=0.009). 20th min, 40th min, 1st, 2nd, 6th, 8th, 12th, 24th and 36th hour

NRS scores at the active period were higher in Group C than in Group E (p<0.0001 each). 4th, 48th and 72nd hour NRS scores at the active period were higher in Group C than in Group E (mean±SD: 3.2±1.3 vs. 2.7±1, 0.4±0.6 vs. 0, 0.3±0.5 vs. 0, respectively, p=0.0001, p=0.008, p=0.007) (Table 4). Group, time and group x time interaction at passive period were statistically significant (respectively, p<0.0001, p<0.0001, p=0.02). Group, time and group x time interaction at active period were statistically significant (respectively, p<0.0001, p<0.0001, p=0.0002).

Table 2. Comparison of the fentanyl consumption via PCA at postoperative time points

	Group C (n=19)	Group E (n=19)	P
0-6th, µg	150.8 ± 6.9	70.3 ± 6.9	<0.0001[a*]
6-12th, µg	144.5 ± 7.2	65.5 ± 7.2	<0.0001[a*]
12-24th, µg	119.2 ± 5.9	48.2 ± 5.9	<0.0001[a*]
24-36th, µg	105 ± 5.1	35.5 ± 5.1	<0.0001[a*]
36-48th, µg	87.6 ± 4.2	14.2 ± 4.2	<0.0001[a*]
48-72th, µg	26.8 ± 3.9	2.4 ± 3.9	<0.0001[a*]
Total Fentanyl consumption, µg	633.9 ± 57.6	236.1 ± 154.3	<0.0001[b*]

Values are mean ± standard deviation. [a] Mixed effects model; [b] Independent sample t test; * P<0.05 is statistically significant

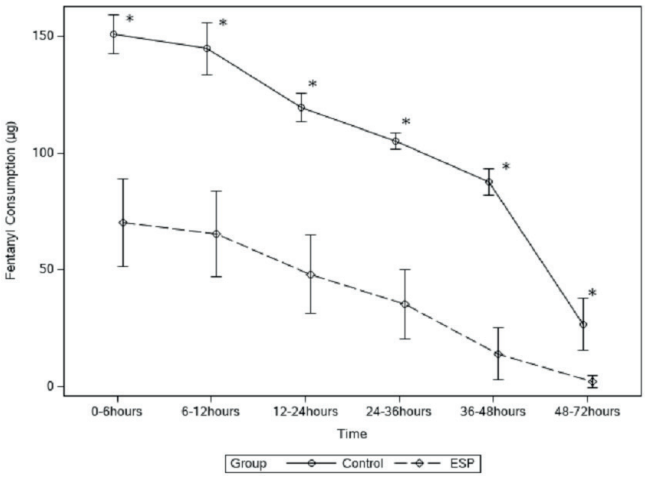
Table 3. Comparison of the intraoperative fentanyl requirement, the rescue analgesic requirement, the first analgesic need time, the unassisted walking time, PACU and hospital stay between groups

	Group C (n=19)	Group E (n=19)	P
Intraoperative fentanyl requirement (%)	63.2	15.8	0.003[a*]
The rescue analgesic requirement (%)	68.4	5.3	<0.0001[a*]
The first analgesic need time (min)	98.5 ± 24.8	146 ± 53.1	0.017*
Unassisted walking time (min)	219.5 ± 32.9	172.9 ± 8.5	<0.0001[b*]
PACU stay (min)	27.1 ± 2.2	18.3 ± 2	<0.0001[b*]
Hospital stay (hour)	81.2 ± 6.4	72	<0.0001[b*]

Values are mean ± standard deviation. [a] Mixed effects model; [b] Independent sample t test; * P<0.05 is statistically significant.

The fentanyl consumption at 0-6th, 6-12th, 12-24th, 24-36th, 36-48th and 48-72nd time periods were higher in group C than in group E (mean±SD: 150.8±6.9 µg vs. 70.3±6.9 µg, 144.5±7.2 µg vs. 65.5±7.2 µg, 119.2±5.9 µg vs. 48.2±5.9 µg, 105±5.1 µg vs. 35.5±5.1 µg, 87.6±4.2 µg vs. 14.2± 4.2 µg, 26.8±3.9 µg vs. 2.4±3.9 µg, respectively, p<0.0001 each) (Table 2, Figure 3). Group, time, group x time interaction were statistically significant (respectively, p<0.0001, p<0.0001, p=0.0002).

There were no statistically significant differences between the two groups for opioid related side effects.



*P < 0.05 between groups at 0-6 hours, 6-12 hours, 12-24 hours, 24-36 hours, 36-48 hours and 48-72 hours

Figure 3. Fentanyl consumption in the postoperative time points

Table 4. Comparison of NRS scores at postoperative time points

	Group C (n=19)	Group E (n=19)	P[†]
At rest			
20 min	5.6 ± 1.4	1 ± 1.5	<0.0001
40 min	6.3 ± 1	1.2 ± 1.6	<0.0001
1th	4.2 ± 1.3	1.4 ± 1.4	<0.0001
2th	3.9 ± 1.4	0.8 ± 1.2	<0.0001
4th	3.2 ± 1.3	0.5 ± 1.1	<0.0001
6th	2.4 ± 1.1	0.4 ± 0.9	<0.0001
8th	2.1 ± 1.3	0.3 ± 0.8	<0.0001
12th	1.6 ± 1	0.2 ± 0.6	<0.0001
24th	1 ± 0.9	0.2 ± 0.6	0.0001
36th	0.6 ± 0.6	0.1 ± 0.3	<0.0001
48th	0.5 ± 0.5	0	0.0003
72th	0.2 ± 0.4	0	0.009
During active movement			
20 min	6.9 ± 1.9	1.9 ± 1.7	<0.0001
40 min	7.9 ± 1.2	2.2 ± 1.6	<0.0001
1th	5.6 ± 1.4	2.4 ± 1.6	<0.0001
2th	4.9 ± 1.2	2.2 ± 1.6	<0.0001
4th	3.2 ± 1.3	2.7 ± 1	0.0001
6th	4.5 ± 1.5	0.8 ± 1	<0.0001
8th	3.7 ± 1.2	0.4 ± 0.9	<0.0001
12th	2.9 ± 1.1	0.3 ± 0.8	<0.0001
24th	2.1 ± 0.7	0.2 ± 0.5	<0.0001
36th	1.4 ± 0.6	0.1 ± 0.3	<0.0001
48th	0.4 ± 0.6	0	0.008
72th	0.3 ± 0.5	0	0.007

Values are mean standard deviation.
[†] Mixed effects model; * P<0.05 is statistically significant

DISCUSSION

In this study, we showed that pre-incisional US-guided ESPB provides lower NRS pain scores and decreases opioid requirement in LSG postoperatively. Besides, opioid requirement during the operation period was also less in Group E. In the ESPB group, PACU and hospital stay were shorter than the control group. In addition, in the ESPB group, the patients reached the unassisted walking time earlier.

Postoperative pain control in obese or morbidly obese patients is more important due to comorbid diseases accompanying. Because, besides its importance in effective pain control, early mobilization, shortening the length of hospital stay and increasing the quality of life, it provides the opportunity to prevent the risks of increased heart attacks, atelectasis, thromboembolism and changes in the immune system. Postoperative pain management should be started before peripheral hypersensitivity and central nervous system hyperexcitability occurs (10). Decreased gastric volume after LSG may increase the toxicity of non-steroidal anti-inflammatory drugs (NSAIDs), such as gastrointestinal bleeding and impaired mucosal integrity. Therefore, the use of these agents is not generally recommended. In addition to obesity and obstructive sleep apnea, opioid selection in the postoperative period greatly increases the risk of pulmonary complications (2). Therefore, the ideal method for postoperative pain control should provide opioid-sparing effect without side effects. For this purpose, many regional anesthesia methods such as local anesthesia infiltration, epidural and transversus abdominis plane (TAP), oblique subcostal transversus abdominis plane (OSTAP) blocks have been involved in pain management in LSG.

Ruiz- Tover et al showed that epidural analgesia and port-side infiltration methods were effective on pain and reduced opioid consumption, but they stated that the analgesia efficiency of both methods was similar (1). In addition, due to excess subcutaneous adipose tissue, the technical difficulty when displaying the epidural block increases the risk of very serious hemodynamic deterioration and neurologic complications such as dural and spinal cord puncture (11,12). In another study, post-side infiltration of bupivacaine for LSG has been shown to have effect on pain in the first four postoperative hours (13).

When the literature is researched, TAP block application was generally encountered for postoperative pain in LSG. Sinha et al., showed that TAP block reduced opioid requirement, improved pain scores during the first 24 hours at rest and movement periods, decreased sedation, enabled early ambulation and increased patient satisfaction (14). Mittal et al., emphasized that TAP block reduced pain scores in 48 hours postoperatively, total opioid and postoperative nausea vomiting (PONV), and caused earlier ambulation of patients (2). However, in a previous study, it was stated that the coexistence of iv PCA + TAP block caused less VAS score in the postoperative 6th and 12th hours compared to only iv PCA, but the VAS scores and cumulative opioid consumption were similar among the groups. Thus, it was indicated that the TAP block was more effective in LSG in the immediate postoperative period (15). Ortiz et al reported that when compared to TAP block and port-side infiltration, both methods did not have a distinct advantage over each other because of their effect on somatic pain (16). Because TAP, OSTAP and port-side infiltration affected cutaneous fibers, they were more effective on somatic pain. Aikawa et al., showed a modified thoracoabdominal (M-TAPA) nerve block with a perichondrial approach in a case exposed to LSG and showed that it was effective in postoperative analgesia by stating that there was a sensory blockade in T3-T12 dermatomes. However, since M-TAPA only affected somatic pain, author applied continuous fentanyl infusion for visceral pain in the ward (11). As a result, in laparoscopic cases, pain is not only of somatic origin, but of both somatic and visceral origin (17). Conversely, in a recent study, it was emphasized that ESPB, which has effect on somatic and visceral pain, was more effective on pain and opioid consumption compared to OSTAP block (9).

Forea et al described ESPB for the first time and stated that local anesthetic (LA) spreads both dorsal and ventral rams of spinal nerves (18). In later studies, epidural and intercostal spread of LA was mentioned (17). In another study, LA's paravertebral space, lumbar plexus, interforaminal space, and epidural space spread were demonstrated by magnetic resonance imaging after high-volume lumbar ESPB (19). In addition, in a case it was reported that it caused sensorial blockade in the opposite side dermatomes after ESPB with 30 ml local anesthetic volume at unilateral T9 level for the purpose of postoperative analgesia in a patient who underwent open nephrectomy (20).

In this current study in which the effectiveness of bilateral ESPB was analyzed for the first time in LSG, the NRS pain scores in the ESPB group at 20th and 40th minutes, 1,2,4,6,8,12,24,36,48th and 72nd hours were determined to be lower and opioid consumption was observed to be less than the control group. Besides, two patients in Group E needed neither paracetamol nor meperidine in the postoperative period, since NRS pain score was lower than 2 at all of time periods. In addition, due to pre-incisional ESPB, it was also observed that opioid requirement during perioperative period was less than the control group. Therefore, we believed that recovery in PACU was faster and the duration of PACU hospitalization was shorter in the ESPB group. Moreover, the patients in Group E were mobilized earlier due to the less opioid requirement in both the preoperative and postoperative period. The patients who had high BMI were more in

Group E than Group C, because the height was lower in the Group E. Also, ASA III patients who had comorbid disease was more in Group E than Group C. Naturally, while these patients were expected to encounter many problems, especially respiratory problems, after LSG. However, there were no complications in the postoperative period due to the postoperative effective pain control, and earlier mobilization through ESPB.

ESPB is a very reliable method because it is an interfacial block performed under ultrasound. Pneumothorax and motor weakness were two complications for ESPB (21,22). Pneumothorax is difficult to encounter as the block occurs under ultrasound. When motor weakness is observed with ESPB in the low thoracic and lumbar levels, they are encountered as a result of the spread of local anesthetics to the lumbar plexus (23). We performed ESPB bilaterally at low thoracic level, but we did not encounter any complications.

Local anesthetic systemic toxicity (LAST) as well as block related complications, which develops as a result of the spread of local anesthesia and its application at high volume, is also among the complications (24). We did not encounter any complications related to LAST in cases where we applied a total of 50 ml of 0.25% bupivacaine. Apart from these complications, block failure/lack of efficiency is also taken into account due to fact that ESPB blocks not only the paraspinal area but also the lateral edges of the mid-abdomen and thoracoabdominal areas (23). Since dermatome areas were not evaluated after the block or in the postoperative period, we could not evaluate this complication. However, unilateral ESPB has been reported to be as effective as bilateral ESPB on postoperative pain in the contralateral dermatome due to the facilitative effect of the pneumoperitoneum and the gravitational effect of the positional change in those exposed to the laparoscopic cholecystectomy operation (25). Moreover, reports showed that ESPB could cause patchy blockade in a dermatome area (26). So, we believe that it does not affect block results.

There are several factors that limit our study. First, the bias was not eliminated because the study plan was retrospective, the second was not evaluating the dermatome areas, the third was not evaluating chronic pain, the fourth a catheter could be inserted catheter into the interfacial area after ESPB but we have not and evaluated chronic pain. The fifth, although ESPB reduced the need for opioids in the preoperative period, bi-spectral index monitoring was not used to measure the depth of anesthesia. Finally, we think that extensive randomized trials in the future will contribute more.

CONCLUSION

As a conclusion, pre-incisional bilateral US-guided ESPB reduces postoperative pain scores and opioid consumption, enables early mobilization, and shortens hospital stay.

Conflict of interest: The authors declare that they have no competing interest.

Financial Disclosure: There are no financial supports.

Ethical Approval: The study protocol was approved by the KTO Karatay University Ethics Committee (decision number 2020/003).

REFERENCES

1. Ruiz-Tovar J, Muñoz JL, Gonzalez J, et al. Postoperative pain after laparoscopic sleeve gastrectomy: comparison pf three analgesic schemes (isolated intravenous analgesia, epidural analgesia associated with intravenous analgesia and port-sites infiltration with bupivacaine associated with intravenous analgesia). Surg Endosc 2017;31:231-6.
2. Mittal T, Dey A, Siddhartha R, et al. Efficacy of ultrasound-guided transversus abdominis plane (TAP) block for postoperative analgesia in laparoscopic gastric sleeve resection: a randomized single blinded case control study. Surg Endosc 2018;32:4985-9.
3. Saber AA, Lee YC, Chandrasekaran A, et al. Efficacy of transversus abdominis plane (TAP) block in pain management after laparoscopic sleeve gastrectomy (LSG): A double-blind randomized controlled trial. Am J Surg 2019;217:126-32.
4. Holländer SW, Sifft A, Hess S, et al. Identifying the bariatric patient at risk for pulmonary embolism: prospective Clinical Trial using duplex sonography and blood screening. Obes Surg 2015;25:2011-7.
5. Ahmad S, Nagle A, McCarthy RJ, et al. Postoperative hypoxemia in morbidly obese patients with and without obstructive sleep apnea undergoing laparoscopic bariatric surgery. Anesth Analg 2008;107:138-43.
6. Tao W, Plecka-Östlund M, Lu Y, et al. Causes and risk factors for mortality within 1 year after obesity surgery in a population-based cohort study. Surg Obes Relat Dis 2015;11:399-405
7. Apfelbaum JL, Ashburn MA, Connis RT, et al. Practice guidelines for acute pain management in the perioperative setting: an updated report by the American Society of Anesthesiologists Task Force on acute pain management. Anesthesiology 2012;116:248-73.
8. Hannig KE, Jessen C, Soni UK, et al. Erector Spinae Plane Block for Elective Laparoscopic Cholecystectomy in the Ambulatory Surgical Setting. Case Rep Anesthesiol 2018;2018:5492527.
9. Altiparmak B, Korkmaz TM, Uysal AI, et al. Ultrasound-guided erector spinae plane block versus oblique subcostal transversus abdominis plane block for postoperative analgesia of adult patients undergoing laparoscopic cholecystectomy: Randomized, controlled trial. J Clin Anesth 2019;57:31-6.
10. Karaca O, Pınar HU, Turk E, et al. The Effects of Pregabalin Plus Ibuprofen on Acute Pain after Laparoscopic Cholecystectomy. J Invest Surg 2019;32:18-95.

11. Aikawa K, Tanaka N, Morimoto Y. Modified thoracoabdominal nerves block through perichondrial approach (M-TAPA) provides a sufficient postoperative analgesia for laparoscopic sleeve gastrectomy. J Clin Anesth 2020;59:44-5.
12. Karaca O, Pınar HU, Arpacı E, et al. The efficacy of ultrasound-guided type-I and type-II pectoral nerve blocks for postoperative analgesia after breast augmentation: A prospective, randomised study. Anaesth Crit Care Pain Med 2019;38:47-52.
13. Moncada R, Martinaitis L, Landecho M, et al. Does preincisional infiltration with bupivacaine reduce postoperative pain in laparoscopic bariatric surgery? Obes Surg 2016;26:282-8.
14. Sinha A, Jayaraman L, Punhani D. Efficacy of Ultrasound-Guided Transversus Abdominis Plane Block After Laparoscopic Bariatric Surgery: A Double Blind, Randomized, Controlled Study. Obes Surg 2013;23:548-53.
15. Wassef M, Lee DY, Levine JL, et al. Feasibility and analgesic efficacy of the transversus abdominis plane block after single-port laparoscopy in patients having bariatric surgery. J Pain Res 2013;6:837-41.
16. Ortiz J, Suliburk JW, Wu K, et al. Bilateral transversus abdominis plane block does not decrease postoperative pain after laparoscopic cholecystectomy when compared with local anesthetic infiltration of trocar insertion sites. Reg Anesth Pain Med 2012;37:1892.
17. Karaca O, Pınar HU. Efficacy of ultrasound-guided bilateral erector spinae plane block in pediatric laparoscopic cholecystectomy: Case series. Agri 2019;31:209-13.
18. Forero M, Adhikary SD, Lopez H, et al. The erector spinae plane block. Reg Anesth Pain Med 2016;41:621-7.
19. Celik M, Tulgar S, Ahiskalioglu A, et al. Is high volume lumbar erector spinae plane block an alternative to transforaminal epidural injection? Evaluation with MRI. Reg Anesth Pain Med Published Online: 2019.
20. Tulgar S, Selvi O, Ahiskalioglu A, et al. Can unilateral erector spinae plane block result in bilateral sensory blockade? Can J Anaesth 2019;66:1001-2.
21. Ueshima H. Pneumothorax after the erector spinae plane block. J Clin Anesth 2018;48:12.
22. Selvi O, Tulgar S. Ultrasound guided erector spinae plane block as a cause of unintended motor block. Rev Esp Anestesiol Reanim 2018, 65:589-92.
23. Tulgar S, Selvi O, Senturk O, et al. Ultrasound-guided Erector Spinae Plane Block: Indications, Complications, and Effects on Acute and Chronic Pain Based on a Single-center Experience. Cureus 2019;11:3815.
24. Karaca O, Pinar HU. Is high dose lumbar erector spinae plane block safe? J Clin Anesth 2020;62:109721.
25. Altiparmak B, Korkmaz TM, Uysal AI. Potential mechanism for bilateral sensory effects after unilateral erector spinae plane blockade in patients undergoing laparoscopic cholecystectomy. Can J Anaesth 2020;67:161-2.
26. Taketa Y, Irisawa Y, Fujitani T. Ultrasound-guided erector spinae plane block elicits sensory loss around the lateral, but not the parasternal, portion of the thorax. J Clin Anesth 2018;47:84-5.