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Erector Spinae Plane Block: An Analgesic Technique as an Alternative to Transversus Abdominis Plane Block in Abdominoplasty Surgery

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ABSTRACT

Background: Managing post abdominoplasty pain can be quite challenging. Multimodal analgesia strategies have been used to provide maximum benefit with less side effects. Combining regional anaesthetic techniques with multiple non opioid analgesics can provide efficient postoperative analgesia. **Objective:** This study aimed at comparing the analgesic efficacy of ultrasound guided erector spinae plane block (ESPB) and ultrasound guided transversus abdominis plane block (TAPB) in abdominoplasty surgery when given as a part of multimodal analgesic strategy.

Patients and methods: A total of 69 females ASA I & II physical status patients aged between 25 and 65 years who were scheduled for abdominoplasty surgery under general anaesthesia were included in this study. Patients were allocated to three groups; Control group received only standard general anaesthesia, TAPB group received standard general anaesthesia in addition to TAPB, while ESPB group received standard general anaesthesia and ESPB. We recorded total opioid consumption, time of first analgesic request, visual analogue score and hemodynamic changes in first 24h postoperatively. **Results:** ESPB and TAPB reduced postoperative opioid consumption and prolonged time till analgesic request than the control group. ESPB prolonged duration of analgesia and reduced postoperative heart rate, while TAPB block was relatively easier and less time consuming.

Conclusion: ESPB and TAPB can provide considerable postoperative analgesia following abdominoplasty surgery when being incorporated in a multimodal analgesia regimen. Therefore, we recommend using either technique to lessen pain in patients subjected to abdominoplasty surgery.

Keywords: Erector Spinae plane block, Analgesic technique, Transversus Abdominis plane block, Abdominoplasty surgery.

INTRODUCTION

Abdominoplasty is a popular body reshaping surgery that often results in great amount of pain. Post abdominoplasty pain usually originates from the long incision and facial plication meaning it is a somatic pain component [(1)]. Improperly managed postoperative pain can delay patient recovery increase incidence of complications and delay ambulation which carries the risk of venous thromboembolism [(2)].w Opioids have been the go-to drugs for decades, but nowadays its use is being devalued in consequence of its multiple side effects [(3)]. Regional anaesthetic techniques is a valuable alterative that has proven its efficacy in preventing nociception following Abdominoplasty surgery [(4)].

An effective face plane block known as the erector spinae plane block (ESPB) has been demonstrated to do so after a variety of procedures [(5)].

For somatic analgesia during abdominal procedures, the transversus abdominis plane block (TAPB) is a well-known abdominal wall block [(6)].

This study aimed at comparing the analgesic efficacy of ESPB and TAPB in abdominoplasty surgery when given as a part of multimodal analgesic strategy.

PATIENTS AND METHODS

This prospective randomized controlled clinical trial was conducted in Mansoura University Hospitals (MUH) for patients subjected to abdominoplasty surgery. A total of 69 ASA I & II physical status patients aged between 25 and 65 years of either sex who were scheduled for abdominoplasty surgery under general anaesthesia were included in this study.

Patients excluded from this clinical trial are those who have contraindications for regional anaesthesia in general such as patient's refusal, local skin infection at the puncture site, hematological diseases, bleeding, or coagulation abnormality, also patients who have psychiatric disorders and allergy to the local anesthetics used.

Sample size calculation:

The primary outcome was the mean amount of opioids consumed on the first postoperative day, and the sample size was calculated using the Power Analysis and Sample Size software programme (PASS) version 15.0.5 for Windows (2017) based on earlier findings [(12, 13)]. To attain 90% power, sample sizes of 23 patients in each group are required (1- β).

Randomization:

Eligible 69 patients were randomly allocated by closed envelop method according to the anesthetic technique used into 3 equal groups:

- ***Control group (Control) (N= 23)*:** Which received only standard general anesthesia.
- ***Transversus abdominis plane block group (TAPB) (N= 23)***: which underwent bilateral transversus abdominis plane blockade; the total volume of local anaesthetic utilised was 25 ml on each side; 15 ml of 0.5% + 5 ml of 2% lidocaine HCL plus 5 ml of saline.
- ***Erector spinae plane block group (ESPB) (N= 23)***: It underwent bilateral erector spinae plane blockade and got a total amount of 25 ml of local anesthetic

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injection, consisting of 15 ml of 0.5% + 5 ml of 2% lidocaine HCL plus 5 ml of saline on each side.

This was a single blinded study in which the two procedures were explained to all patients of all groups with none of them being able to identify postoperatively if they are included in the control group or received either one of the two blocks. A closed envelop method was used to determine which group will this patient be a part of, and the choice was made by a nurse not involved in the study.

Anesthetic management:

Preoperative patient preparation and assessment:

- Age and body mass index (BMI) information for the patient were recorded.
- All patients had pre-operative evaluations, including a clinical examination, complete blood count, coagulation profile, fasting and two-hour post-prandial blood sugar testing, liver and kidney function checks, and electrocardiograms (ECG).
- Each patient received a brief explanation of the research methodology and local methods the night before surgery. Patients received instruction on how to utilize a visual analogue scale.

Intraoperative and postoperative management:

- Upon entering the operation room, an intravenous cannula was placed, and midazolam 3 mg IV premedication was given.
- Baseline values of basic monitoring were recorded (Heart rate, noninvasive blood pressure (NIBP), and Peripheral arterial O_2 saturation).
- Preoxygenation for 3 minutes and general anesthesia induction was done using fentanyl IV 1.5 mcg/kg, IV propofol at dose 2-3mg/kg till loss of verbal contact with the patient, and atracurium 0.5mg/kg then endotracheal intubation and mechanical ventilation. Anesthesia was maintained using isoflurane MAC (1-1.5%) with oxygen: air 50%:50% and top up doses of atracurium (20% of intubating dose).
- After finishing the surgery and before reversal of muscle relaxant, patients were given either erector spinae or transversus abdominis plane block with the help of ultrasound guidance in block groups, or no block in the control group.
- Neostigmine (0.05 mg/kg) and atropine (0.02 mg/kg) were used to reverse any remaining muscular relaxation at the conclusion of operation after the infusion and isoflurane were stopped. After regaining sufficient spontaneous breathing and meeting the requirements for extubation, the procedure was completed. Patients were sent to the PACU, where they had two hours of observation before being sent back to the ward for a 24-hour postoperative observation period.
- We implemented ***a multimodal analgesia strategy*** in the postoperative period. All patients in all groups were given Diclophenac75 mg IV and Paracetamol 500 mg every 12 hours in addition to either one of the blocks or non in the control group.

Technique of Erector spinae plane block:

The procedure was applied bilaterally while the patient was in the decubitus position. A high-frequency linear ultrasound probe was used to examine the vertebrae and find the T7 spinous process. The epidermis and subcutaneous tissue, the trapezius, and the erector spinae muscle were then made superficially apparent to the acoustic shadows of the transverse processes by acquiring the parasagittal image. After using alcohol to clean the skin, a 22-G 90-mm spinal needle was moved from cranial to caudal in-plane to the ultrasound beam until bone contact was made (the T7 transverse process). 0.5-1 ml of saline was administered to ensure that the needle tip was in the proper location. After aspiration, a local anesthetic mixture was then injected into the ESP. The propagation of the local anesthetic separated the transverse process from the erector spinae muscles. The same action was performed using the same technique on the opposite side [7-9] (**Figure 1**).

The Ultrasound machine used is Philips ClearVue 350 and the probe used is L12-4 Active Array.

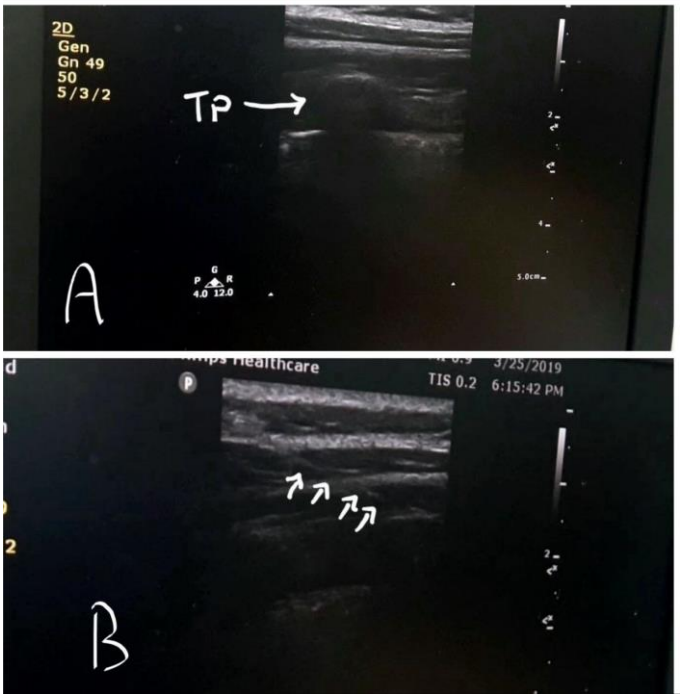

Figure (1): Erector spinae plane block A: prior to injection B: position of the needle while injecting local anesthetic.

Technique of Transversus abdominis plane block:

With the patient supine and the anesthesiologist facing the ultrasound screen, a high frequency ultrasound probe was positioned transverse to the abdominal wall at the mid-axillary line in the axial plane, midway between the costal edge and iliac crest. Under US direction, the 20 G short-bevel needle was introduced anteriorly and entered in plane, with the tip in the mid-axillary line, between the internal oblique and the transversus abdominis muscles. Following a favorable

view of the skin, subcutaneous tissue, fat, external and internal obliques, transversus abdominis, peritoneum, and bowel loops on the anterior abdominal wall, this was done.

In order to prevent intravascular injection, a dynamic injection of local anesthetic mixture was performed following aspiration of 2 ml of saline to check the right needle location. Between the two muscles, the local anesthetic solution may be seen as an echolucent lens-shaped hypoechoic region [10, 11] (**Figure 2**).

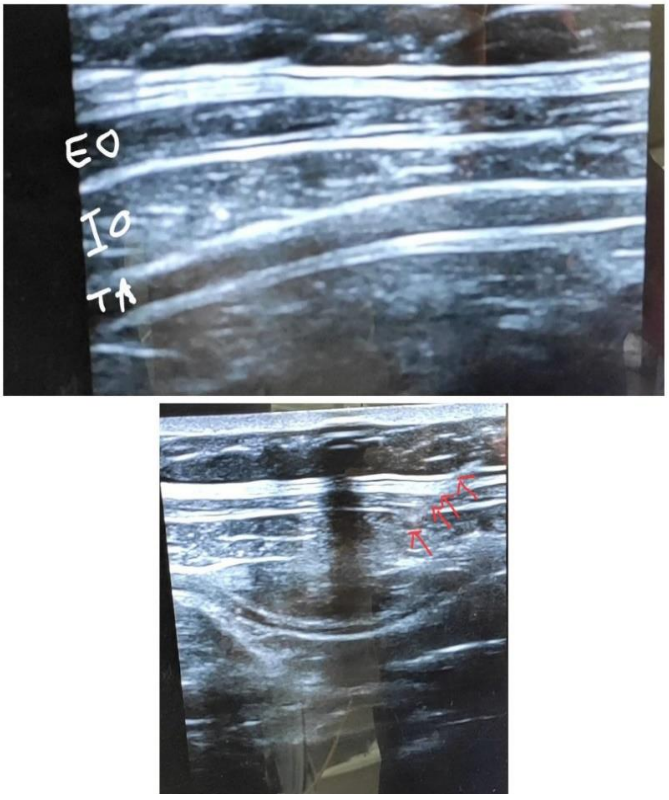

Figure (2): Transversus abdominis plane block. The picture above shows muscles of anterior abdominal wall. The picture below shows needle and local anesthetic injection separating internal oblique and transversus abdominis.

The recorded data:

The primary outcome: Total opioid consumption in the first postoperative day.

The secondary outcomes:

- The period of analgesia (time of the first request for analgesia).
- Baseline measurements of heart rate, mean arterial blood pressure, and oxygen saturation were taken before the procedure, after the block, after extubation, and upon arrival in the PACU, as well as 2 hours, 4 hours, 6 hours, 12 hours, 18 hours, and 24 hours afterwards.
- At 2h, 4h, 6h, 12h, 18h, and 24h postoperatively, pain was evaluated using the visual analogue scale (VAS), with 0 indicating no pain and 10 being the most excruciating agony imaginable. All patients in the three groups received 500 mg of paracetamol and 75 mg of diclophenazine IV every 12 hours. Patient got 25 mg of IV pethidine as a rescue analgesic if VAS was > 4.
- Serum One hour prior to the procedure, during the operation, and two hours after the patient had the block, the cortisol level was monitored. The system software automatically determined the test outcomes. Using calibration data that was previously saved, the quantity of cortisol in the sample was calculated from the detected light production.
- We recorded the following time intervals:
    - *Duration of anesthesia*: from induction to discontinuation of all anesthetics.
    - *Duration of surgery*: from skin incision to completion of the whole procedure.
    - *Duration of performing the block*: time taken to perform the block.
- Any block-related complications, such as pneumothorax, respiratory difficulty or depression, hematoma, local anesthetic toxicity, intravascular injection, nerve damage, haemorrhage, infection, accidentally puncturing the peritoneum with a TAP block, and the occurrence of PONV, were noted.

Ethical consent:

The study protocol was approved by the Institutional Review Board (IRB) in Mansoura faculty of medicine (Code number: MD.19.03.155). Clinical trial was registered *ClinicalTrials.gov identifier (NCT number):* NCT03940885. Written informed consents were obtained from all patients prior to their participation in the study. This study was conducted in compliance with the code of ethics of the world medical association (Declaration of Helsinki) for human subjects.

Statistical analysis:

The collected data were coded, processed and analyzed using the SPSS (Statistical Package for Social Sciences) version 25 for Windows® (IBM SPSS Inc, Chicago, IL, USA). Data were tested for normal distribution using the Shapiro Walk test. Qualitative data were represented as frequencies and relative percentages. Chi square test ($\chi 2$) and Fisher's exact test to calculate difference between two or more groups of qualitative variables. Quantitative data were expressed as mean and standard deviation (SD). Independent samples t-test was used to compare between two independent groups of normally distributed variables (parametric data). For normally and abnormally distributed continuous data, the one-way ANOVA and Kruskall Wallis tests were employed, respectively. Every test was run with a 95% confidence level. A P value of 0.05 or below was regarded as statistically significant.

RESULTS

A total of 69 patients who met the inclusion criteria were enrolled in this study after a primary eligibility assessment of seventy-four patients resulted in the exclusion of 5 patients (**Figure 3**).

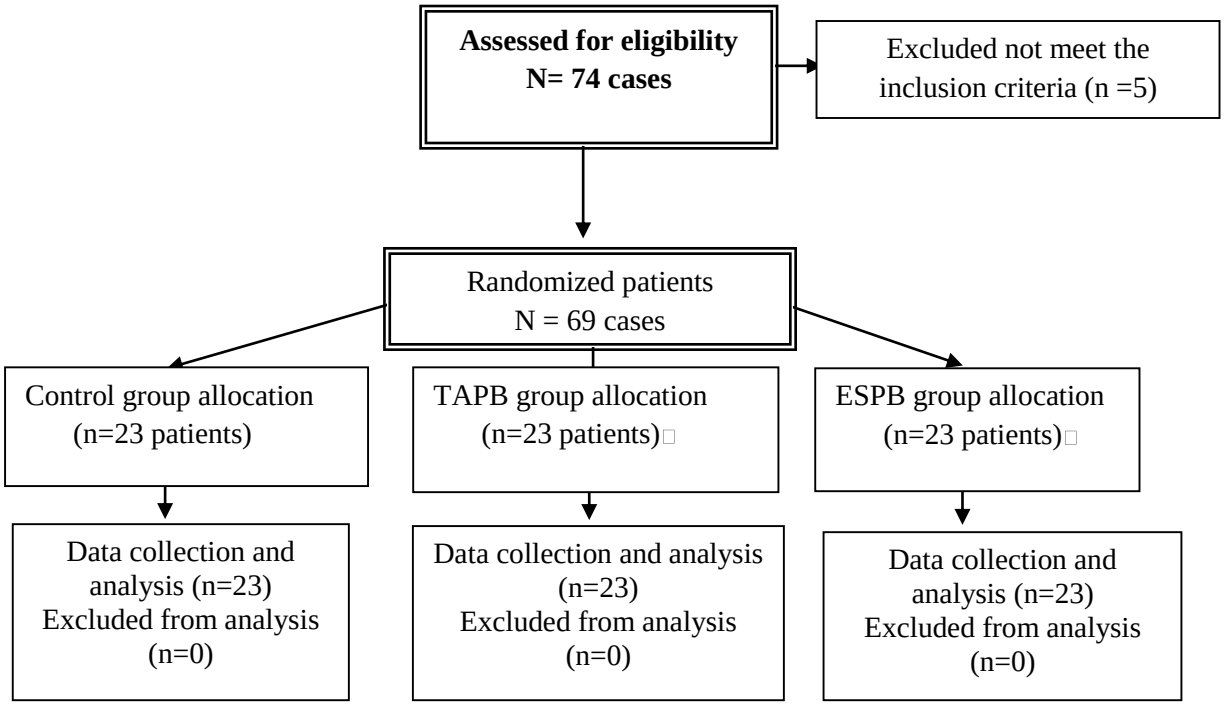

Figure (3): Flowchart of the study.

Regarding BMI and ASA, patients in the three groups were comparable (P values >0.05) (**Table 1**).

Table (1): Demographic data in the studied groups.

Variable		Control group (N= 23)	TAP group (N= 23)	ESPB group (N= 23)	P	P1	P2	P3
Age		38.17 ± 7.133	37.35 ± 8.478	37.22 ± 7.459	0.901	0.718	0.675	0.954
BMI		32.30 ± 3.698	33.00 ± 4.513	31.57 ± 4.294	0.512	0.575	0.551	0.249
ASA	**1**	14 (60.9%)	13 (56.5%)	14 (60.9%)	0.942	> 0.05	> 0.05	> 0.05
	2	9 (39.1%)	10 (43.5%)	9 (39.1%)				
P is significant when ≤0.05. P1: Control group vs TAP group. P2: Control group vs ESPB group. P3: TAP group vs ESPB group.								

Similarly, no statistical difference was observed between the three study groups as regard duration of anaesthesia (P values >0.05). Duration of performing the block exhibited highly statistically significant difference between the 2 blocks being longer in ESPB group compared to TAPB group. (15.83 ± 2.309 and 8.13 ± 2.117 respectively, P <0.001) (**Table 2**).

Table (2): Duration of anaesthesia and duration of performing the block in the studied groups:

Variable	Control group (N= 23)	TAP group (N= 23)	ESPB group (N= 23)	P	P1	P2	P3
Duration of anaesthesia (hours)	4.10 ± 1.092	3.87 ± 1.052	4.13 ± 1.019	0.660	0.466	0.917	0.405
Duration of performing the block (minutes)	-	8.13 ± 2.117	15.83 ± 2.309‡	-	-	-	**< 0.001**
P is significant when ≤0.05. P1*: Control group vs TAP group. P2†: Control group vs ESPB group. P3‡: TAP group vs ESPB group.							

There was highly statistically significant increase in heart rate at extubation in control group compared to both TAPB group and ESPB group (P <0.001). However, no statistical difference was detected between both block groups regarding heart rate at the same time point (P values >0.05). Heart rate was significantly different between TAPB group and control group only at extubation. On the other hand, postoperative heart rate differed significantly between ESPB group & control group at most of recorded readings (PACU, 2 hours, 4 hours, 6 hours, and 24 hours). Also, there was statistically significant difference in postoperative heart rate at PACU, 2h, 4h, 6h between TAPB and ESPB groups (P <0.05) (**Figure 4**).

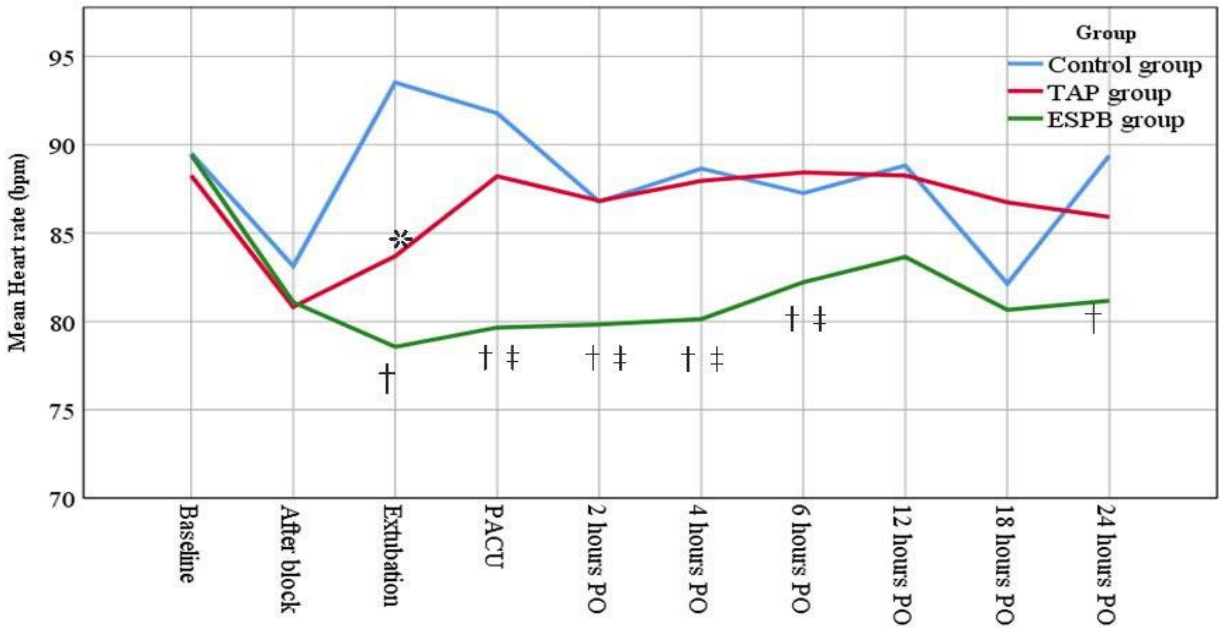

Figure (4): Intra- and postoperative heart rate monitoring in the current study. Control group vs TAP group*. Control group vs ESPB group†. TAP group vs ESPB group‡.

There was no statistically significant difference between the three study groups with respect to mean ABP (P values >0.05).

Through the course of the study, there was no discernible difference in the analysed groups' peripheral arterial oxygen saturation (SpO2).

In terms of pain assessment, post-operative visual analogue score (VAS) demonstrated a highly significant difference in control group compared to both TAPB and ESPB groups at PACU, 2 hours, 4 hours, 6 hours, 12 hours, 18 hours and 24 hours postoperatively (P <0.001) (**Figure 5**).

VAS revealed highly significant difference between ESPB group and TAPB group postoperatively at 6 hours and12 hours (P <0.001), and statistically significant difference at 2 hours, 18 hours, 24 hours (P values 0.024, 0.001 and 0.010, respectively) (Figure 5).

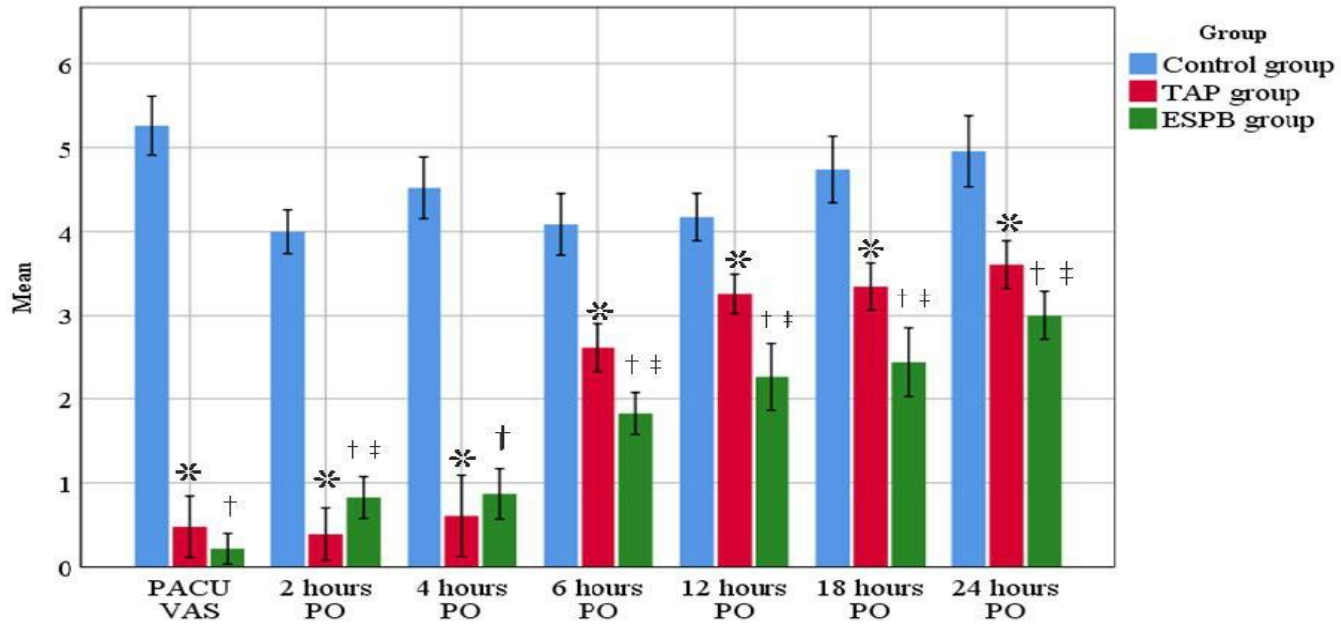

Figure (5): Postoperative VAS score follow-up of the studied groups. Control group vs TAP group*. Control group vs ESPB group†. TAP group vs ESPB group‡.

Pre and intraoperative serum cortisol level were comparable between study groups (P values >0.05). However, it showed highly statistically significant differences postoperatively between control group compared to both TAPB group and ESPB group (P <0.001). No statistically significant difference between ESPB group and TAPB group regarding postoperative cortisol levels (P values >0.05) (Table 3).

Table (3): Cortisol level in the studied groups.

Cortisol	Control group (N= 23)	TAP group (N= 23)	ESPB group (N= 23)	P	P1	P2	P3
Preoperative	15.97 ± 4.530	15.30 ± 4.393	14.25 ± 2.896	0.348	0.571	0.151	0.381
Intraoperative	16.74 ± 3.745	17.57 ± 3.386	18.59 ± 4.218	0.262	0.461	0.104	0.367
Postoperative	30.57 ± 6.900	11.67 ± 3.590*	10.73 ± 2.287†	**< 0.001**	**< 0.001**	**< 0.001**	0.503

Standard deviation and mean are used to express data. P is significant when < 0.05. P1*: Control group vs TAP group. P2†: Control group vs ESPB group. P3‡: TAP group vs ESPB group.

Regarding the number of patients who needed rescue analgesia in the first 24 hours following surgery, there was a very statistically significant difference between the groups (P <0.001).

Between the control group and the TAPB group and the control group and the ESPB group, there were statistically significant changes in the same parameter (P <0.05). There was no statistically significant difference between the two block groups for this measure (P values >0.05) (**Table 4**).

There was highly statistically significant difference regarding analgesic requirement in 1st 24 hours postoperative between groups, control and TABP group, and control and ESPB group (P <0.001). Analgesic requirement in 1st 24 hours postoperative was comparable between the two block groups (P values >0.05) (**Table 4**).

There was highly statistically significant difference regarding 1st request of analgesia between all study groups, between control group and TAPB group, and between control group and ESPB group (P <0.001). First request of analgesia was statistically significant between TAPB group and ESPB group (P value= 0.011) (**Table 4**).

Table (4): Comparative analysis of the studied groups regarding number of patients who needed rescue analgesia, pethidine requirements in 1st 24 hours postoperative and 1st request of analgesia.

Analgesia	Control group (N= 23)	TAP group (N= 23)	ESPB group (N= 23)	P	P1	P2	P3
Number of patients who required rescue analgesia in 1st 24 hours postoperative	23 (100.0%)	13 (56.5%)*	10 (43.5%)†	**<0.001**	**<0.05**	**<0.05**	>0.05
Pethidine requirement in 1st 24h postop. (mg)	41.30 ± 12 .175	25.00 ± 0.0*	25.00 ± 0.0†	**<0.001**	**<0.001**	**<0.001**	1
1ST request of analgesia (hours)	0.87 ± 0.0	15.54 ± 6.540*	20.57 ± 4.721† ‡	**<0.001**	**<0.001**	**<0.001**	**0.011**

P is significant when ≤0.05. P1*: Control group vs TAP group. P2†: Control group vs ESPB group. P3‡: TAP group vs ESPB group.

DISCUSSION

This study was conducted on sixty-nine patients scheduled for abdominoplasty surgery in Mansoura university hospitals. The results of our study demonstrated that ESPB and TAPB reduced postoperative opioid consumption and prolonged time till analgesic request than the control group. ESPB came superior to TAPB in prolonging the time till first request of analgesia, significantly lower postoperative heart rate and significantly reduced VAS pain scores, While TAPB was less time consuming and did not carry the difficulty of repositioning the intubated patient. Both blocks came comparable in number of patients who needed rescue analgesia, postoperative cortisol level and in total opioid consumption postoperatively. Consequently, they are both recommended to alleviate pain following abdominoplasty surgery.

Abdominoplasty is an aesthetic extraperitoneal procedure designed to remove excess fat and excess skin. Due to the vast surgical field, requirement for frequently considerable tissue mobilisation, plication of straight abdominal muscles for muscular layer abnormalities, and substantial liposuction, abdominoplasty is a very painful treatment [(14)]. Pain in abdominoplasty surgery is purely somatic originating from the skin incision and facial plication [(15)]. Since the pain component is merely somatic, ESPB and TAPB should both be effective in addressing such pain.

TAPB blocks the anterior branches of thoracolumbar nerves that originate from T6-L1, which give feeling to the anterior abdominal wall, in order to produce somatic analgesia [(10)]. The erector spinae plane, where the dorsal and ventral rami of the thoracic spinal nerves originate, is where ESPB deliver both somatic and visceral analgesia by cephalad and caudad diffusion of local anesthetic [(8,16)].

There was highly statistically significant difference as regard duration of performing the block between the 2 blocks being longer in ESPB group compared to TAPB group. ESPB required more time to be performed 15.83 (SD 2.309) minute compared to 8.13 (SD 2.117) minutes for TAPB group. Since the block was being performed after surgery and before awakening the patients who were still intubated and anesthetized, we encountered some challenges with ESPB. TAPB was given with patients in supine position, so it was easily and quickly done. On the contrary, ESPB needed special positioning. The patient had to be in the lateral position on one side, and then repositioned to the other side, as the sonographic view is more visible on the upper side of the patient and the block was given bilaterally.

Maintaining the patient in this position while under anaesthesia needed special considerations. Starting with holding the patient's head and ETT in place to supporting the patients (who are usually overweight or obese) till giving the block so, we needed two assistants. The process was difficult and time consuming due to the circumstances of giving the block not difficulty in the ESPB technique itself.

There was no statistically significant difference in heart rate between the two block groups at the same time point (P values > 0.05), the control group's heart rate increased much more during extubation than either the TAPB group or the ESPB group did ($P \leq 0.001$). At most of the recorded measurements, the difference in postoperative heart rate between the ESPB group and the control group was statistically significant (PACU, 2h, 4h, 6h, and 24h). Additionally, at PACU, 2 hours, 4 hours, and 6 hours after surgery, there was a statistically significant difference in postoperative heart rate between the TAPB and ESPB groups, with greater values in the TAPB group ($P < 0.05$).

Our results were consistent with **Hassanin *et al.*** [(17)], who compared ultrasound guided TAPB with ESPB in emergency laparotomy surgeries and observed a statistical increase in heart rate in the control group than in the TAPB group at 1, 2, 4, 10, and 12 hours postoperatively. Also, statistically higher heart rate, in control group when compared with the ESPB group, 1, 2, 4, 6, 8, 10, and 12 hours postoperatively. However, when comparing TAPB and ESPB groups, heart rate was statistically higher at 6 and 8 hours.

There was no statistically significant difference in mean arterial blood pressure or oxygen saturation between the study groups. On the contrary, our data were in contrast with those of **Hassanin *et al.*** [(17)] who found a statistical increase in mean arterial blood pressure in control group when compared with both TAPB and ESPB groups.

Our results showed that both ESPB and TAPB provided more effective postoperative analgesia than the control group, as substantiated by the highly significant difference in VAS, number of patients who required rescue analgesia, total pethidine requirements and first analgesia request. On the other hand, TAPB and ESPB provided comparable postoperative analgesia as evidenced by no statistically significant difference as regard postoperative cortisol levels, number of patients who needed rescue analgesia and total pethidine requirements in 24h postoperatively. ESPB came superior to TAPB in prolonging duration of analgesia as time of 1st analgesic request was 20.57 (SD 4.721) hours for ESPB compared with 15.54 (SD 6.540) hours for TAPB. There was also statistically significant difference between ESPB and TAPB group in VAS at 2 hours, 6 hours, 12 hours, 18 hours, and 24 hours, postoperatively.

Our findings correlate with those of **Hassanin *et al.*** [(17)], who found that ESPB was effective in providing postoperative analgesia, with delayed request for analgesia, less analgesic requirements, and lower pain scores than the other two groups. Their findings contradicted our findings regarding total postoperative analgesic consumption as they found that ESPB group needed less fentanyl compared with TAPB group.

These results coincide with the results found by **Kamel *et al.*** [18], who compared bilateral ultrasound guided ESPB and TAPB in abdominal hysterectomy surgeries. Both blocks were given at the end of the surgery and before muscle relaxant reversal. They found that VAS scores were significantly lower in ESPB at time intervals 30 minutes, 2, 4, 6, 8, 12, 16, 20 and 24 hours postoperatively. In addition, they found that first analgesic request delayed in ESPB 14.81 (SD 3.52) hours than in TAPB 10.58 (SD 2.35) hours. In contrary to our results, they found that ESPB group needed less morphine in 24h postoperatively than did the TAPB group. They concluded that ESPB is the better block in providing effective and longer duration of postoperative analgesia with less opioid consumption.

Another study by **Elsawy and Abdelhameed**[19], compared both ESPB and TAPB in abdominoplasty surgery. Both blocks were given following completion of surgery and before muscle relaxant reversal. They found that VAS was significantly lower in ESPB group than in TAPB group at 8hrs and 12hrs postoperative. Also, like our findings they found that ESPB prolonged duration till first analgesic request 9.16 (SD 1.07) hours compared to 7.65 (SD 0.75) hours in TAPB group. On contrary to our findings, they found a significant reduction in pethidine intake in ESPB group in first 24 hours postoperatively.

To clarify this contradictory in both our and their results in the same operation, they mentioned that abdominoplasty has both somatic and visceral pain component thus concluded the superiority of ESPB over TAPB in managing visceral postoperative analgesia. Abdominoplasty is a variant surgery that can have several different steps depending on the case needs [20]. It can only be aesthetic to remove excess skin and facial plication (somatic pain component), or it can also add hernia repair if patient requires it (visceral pain component). Our research is different in that we did not include cases that required hernia repair, so we only managed somatic pain component.

Abdominoplasty has long been analgesicized using transversus abdominis plane blocks. TAP block usage in abdominoplasty has been studied by **Araco *et al.*** [6], **Abo-Zeid *et al.*** [14], **El Sayed *et al.*** [21] and **Vonu *et al.*** [22], who discovered that it is useful for lowering postoperative opioid use and delivering postoperative analgesia.

Liheng *et al.* [23], conducted a meta-analysis including 570 patients from 10 different randomized controlled trials that compared both Erector spinae plane block and TAPB in abdominal surgeries. They found that across all studies, ESPB significantly reduced 24h postoperative opioid consumption and produced longer block duration when compared to TAPB. Pain scores were slightly lower in ESPB group than in TAPB. They concluded that ESPB provided statistically better and clinically equivalent analgesic efficacy in addition to longer block duration than TAPB. At the end they mentioned the restrictions of ESPB use since it requires the patient to be lateral, prone or sitting prior to anaesthesia in comparison to the relative simplicity of TAPB in that matter is being performed in supine position.

It is important to note that all these previously mentioned studied were done in surgeries that have both pain components, visceral and somatic pain thus required a block that can cover both pain elements. None of the previous studies compared both blocks in a surgery that produces only somatic pain. Our research only compares the somatic element of both blocks.

In conclusion, ESPB and TAPB can provide considerable postoperative analgesia following abdominoplasty surgery when being incorporated in a multimodal analgesia regimen. ESPB furtherly prolonged duration of analgesia while TAPB was easier and less time consuming. Therefore, we recommend using either technique to lessen pain in patients subjected to abdominoplasty surgery.

The main limitations of the current study was the limited time of analgesia because we performed single injection without using an additive to prolong the duration of analgesia and without inserting a catheter to allow subsequent injections. Another drawback is we did not do a dynamic assessment of pain, while moving or during cough. It would give a much better assessment of pain. Thus, we recommend prolongation of duration of analgesia via adding adjuncts as dexmedetomidine or inserting a catheter and applying a dynamic pain assessment in subsequent research.

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