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Challenge Journal of Perioperative Medicine

Editorial

Where does the praise for artificial intelligence come to an end? Tolerance for anything is not boundless

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Artificial intelligence (AI) systems are designed to mimic the thinking and decision-making processes of the human mind. While many people use the term 'AI' instead of 'machine learning' or 'deep learning,' it's important to note that these learning systems are just one aspect of AI's broader learning mechanisms [1]. Systems like deep learning solve problems using programmed algorithms and do not engage in any form of 'thinking' beyond the assigned tasks. However, the learning process of AI may start with the algorithms that the programmers recommend to use, but then it becomes a sophisticated process as it acquires unique decision-making and problem-solving abilities in ways that we cannot predict [2].

In perioperative medicine, AI can serve various purposes, including preoperative evaluation and risk assessment, selecting indication-image-specific surgical approaches, efficient perioperative monitoring, and determining personalized regimens for early recovery.

We encourage authors to submit all articles pertaining to the use of AI in perioperative medicine, which are relevant to the scope of our journal, for evaluation and potential publication. However, while we would certainly appreciate evaluating a manuscript that examines the effectiveness of an AI-based system in a clinical trial, assessing an article authored by an AI would create a sense of deception, which holds true for any editorial board.

We would like to inform you that we do not consider studies in which AI assumes the role of an author, methodologist, or supervisor; except for clinical studies that adhere to specific guidelines for evaluating the effectiveness of AI in roles such as authorship, data collector, analyser etc.

Certainly, the utilization of AI-based systems by non-native English speakers to enhance the linguistic quality of their articles is not encompassed within the aforementioned scope and should be encouraged. In such instances, we believe it would be more suitable for the authors to explicitly mention the name of the AI-based program they employed for linguistic improvements immediately before the references section at the end of the manuscript, as it promotes transparency [3]. We anticipate that our submission system will soon include a dedicated button to address this specific situation.

Disclosure: *Artificial intelligence/machine learning systems were not utilized in the creation of this article, except for linguistic improvement. For this purpose, the May 24 version of ChatGPT was employed.*

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Research Article

Comparison of the postoperative analgesic efficacy of ultrasound-guided suprainguinal fascia iliaca block applied with two different concentrations of bupivacaine in patients undergoing hip surgery under spinal anesthesia

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ABSTRACT

Aim: Management of postoperative pain in hip surgeries is important for the quality of recovery. When regional anesthesia techniques are added to the multimodal analgesia plan, they increase the effectiveness of the analgesia plan. Supra-inguinal fascia iliaca block (SIFIB) is a technique that has been reported to be effective in hip surgery but requires the use of high-volume local anesthetics. Our aim in this retrospective study is to investigate the efficacy of local anesthetic in SIFIB when administered at a concentration lower than the conventional concentration.

Method: The files of the patients who underwent hip hemiarthroplasty were planned to be evaluated retrospectively. Patients were grouped according to the bupivacaine concentration used in SIFIB (0.25% vs. 0.20%) and statistically evaluated in terms of morphine requirement, pain scores, and time to first analgesic.

Results: There was no significant difference between the groups in terms of NRS score and cumulative morphine consumption at the 3rd, 6th, 12th, 18th, and 24th hours ($p>0.05$). When compared the first analgesia requirement times, there was no significant difference between Groups ($p>0.05$).

Conclusions: A single shot SIFIB administered at a concentration of 0.20% also has analgesic properties, as do the conventional concentration of SIFIB containing 0.25% bupivacaine.

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1. Introduction

A hip replacement surgery involves replacing a damaged or worn part of the hip joint with an artificial prosthesis [1]. This surgery is typically performed to treat conditions such as osteoarthritis, hip fractures, and other hip problems. After the surgery, patients may experience varying levels and types of pain, depending on the type of surgical procedure and incision used [2]. The pain can be caused by several factors related to the surgical procedure, including tissue damage at the site of the surgery, stretching and straining of muscles during implant placement, and swelling of tissues after the surgery [3]. However, there are many different methods of pain management available to help reduce postoperative pain. These methods include both opioid and non-opioid

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pain relievers, as well as peripheral or interfascial plane blocks and intra-articular injections [2]. The choice of pain management method depends on several factors, such as the patient's individual condition, the level of pain experienced, and the risk of post-surgical complications.

Regional anesthesia techniques such as epidural analgesia, lumbar plexus block, and conventional fascia iliaca block can be used for postoperative analgesia in patients undergoing total hip arthroplasty. Suprainguinal fascia iliaca block (SIFIB) was defined by Hebbard et al. [4] in 2011 as a simple, safe and easy technique that allows 'anterior blockage of the lumbar plexus'.

In this study, our aim was to investigate and compare the postoperative analgesic efficacy of SIFIBs administered with different local anesthetic concentrations at the end of surgery in patients undergoing hip surgery under spinal anesthesia.

2. Materials and Methods

Local ethics committee approval (SUKAEK 2022/7/12) was obtained for this retrospective study. The data of patients between the ages of 35-90, who underwent hip hemiarthroplasty procedure under spinal anesthesia at Samsun University Samsun Training and Research Hospital between January 2022 and August 2022, with physiological class I-III of the American Society of Anesthesiology (ASA) were analyzed retrospectively.

Patients who received SIFIB for postoperative analgesia and were given a patient-controlled analgesia (PCA) device with morphine in the postoperative analgesia protocol were included in the study. Exclusion criterias were defined as allergic reaction to local anesthetics, infection at the injection site, patients under the age of 18 years of age and ASA scor over III, presence of cognitive dysfunction that may affect pain assessment'. All patients included in the study received the same anesthesia (spinal anesthesia) and pereoperative and postoperative analgesia protocols 'except for SIFIB concentration.

Descriptive data such as age, gender, weight-height, and operation time of the patients were collected. In addition, data on postoperative pain evaluation such as block concentration used, time to first analgesia requirement, pain intensity at specified intervals, and use of analgesia at certain intervals were collected.

2.1. Standard anesthesia and analgesia protocol

We have standardized protocols for anesthesia and analgesia in patients undergoing hip surgery under spinal anesthesia in our clinic, and the standard protocol detailed below was applied to all patients included in the study.

To ensure consistency in anesthesia and perioperative pain management for all patients, data was collected using a standardized protocol. During surgery, vital signs such as electrocardiogram, noninvasive blood pressure, and peripheral oxygen saturation were closely monitored. Spinal anesthesia was performed in the sitting position using a 26-gauge spinal needle at the L3-L4/L4-L5 level with 2.5-3 mL of 0.5% heavy bupivacaine for surgical anesthesia, without any additional adjuvant drugs. The surgery began after confirming a sensory block at the T10 level through a pinprick test. The surgical team did not use infiltrative analgesia for the surgical site. After surgery, patients were given 1 g of intravenous paracetamol and 50 mg of intravenous dexketoprofen.

In the ward, patients received 1 g of intravenous paracetamol every 8 hours and 50 mg of intravenous dexketoprofen every 12 hours. Patient-controlled analgesia (PCA- BodyGuard 595, Pain Manager infusion pump, Israel) was initiated in the recovery room immediately after the performance of block procedure. PCA used morphine with a concentration of 0.3 mg/ml and a total volume of 100 ml, with a bolus dose of 1 mg and a lock-in time of 20 minutes. The 4-hour limit was set as 10 mg. There was no basal infusion. Patients were instructed to request analgesia when their Numeric rating Scale (NRS) score was 4 or greater. The NRS score is a tool used to measure the intensity of pain in adults. It uses a numerical scale ranging from 0 to 10, with the patient selecting the integer that best describes their level of pain. The scale ranges from 0, indicating no pain, to 10, indicating the worst imaginable pain, while ensuring that the patients were not interrupted during their inhalation. If the NRS score remained at 4 or above despite the use of PCA in the first 24 hours, 25 mg of intravenous meperidine was administered as rescue analgesia. The total amount of morphine consumption was recorded at 3rd, 6th, 12th, 18th, and 24th hour intervals.

During the first 24 hours following surgery, the patients' pain levels were assessed at rest using the Numeric Rating Scale for static pain (NRS-S) at 3rd, 6th, 12th, 18th, and 24th hours.

2.2. Performance of SIFIB

In our clinic, SIFIB is performed for postoperative analgesia in the block room, in the supine position at the end of the surgery. All applications were performed by or under the supervision of an anesthesiologist (ST) experienced in regional anesthesia with ultrasound guidance. An in-plane technique and a high-frequency linear transducer (10-18 MHz, Esaote MyLab™30 Gold Genoa, Italy) were used to perform the block. The transducer was placed obliquely on the inguinal crease Femoral artery, femoral nerve, fascia iliaca and iliacus muscle were identified.

The transducer was moved laterally and the fascia iliaca was identified between the sartorius muscle and the iliacus muscle. The 'bow-tie mark' was determined by rotating and sliding upward the transducer in the oblique plane. The block needle (Vygon Echoplex, 85 mm, 21 G, Ecouen, France) was inserted caudally and advanced into the space between the fascia iliaca and iliacus muscle. Hydrodissection was performed with 1 ml of saline, 50 ml of 0.25% or 0.20% Bupivacaine was administered slowly when the spread was determined to be in the correct location. Local anesthetic was confirmed to diffuse into the area just below the deep circumflex artery.

The preference for low concentration bupivacaine (0.20%) was not intentionally made in the patients included in this study. At a time when the commercial availability of bupivacaine was limited, this trend was made in order to provide analgesia to more patients.

2.3. Statistics

The openepi.com website was used for statistical analysis. The Kolmogorov-Smirnov test was used for normality assessment. Mean and standard deviation and/or median and interquartile range (25th and 75th percentiles) were used to present descriptive data. Mann-Whitney U test was used to compare continuous variables, and Chi-square test was used to compare rates (with Yates correction). Fisher's exact test was used to compare categorical variables (ASA classification, gender, etc.). Statistical significance threshold was determined as $p<0.05$. Bonferroni correction was used for the analysis of NRS scores and statistical significance was set at $p<0.001$ due to measurements from 5 time points.

3. Results

Between the specified dates, the data of 39 patients who met the criteria for inclusion in the study were collected. Two patients were excluded from the study due to lack of data in the records and 2 patients were excluded due to PCA device malfunction. All patients received SIFIB in a volume of 50 ml (n: 35). Bupivacaine concentration was 0.20% in 15 patients and 0.25% in 20 patients. When the patients were grouped as SIFIB-0.20 and 0.25, there was no statistical difference in descriptive data such as age, gender, ASA score, height, weight ($p<0.05$) (Table 1). Flow diagram of our study is presented in Fig. 1.

Table 1. Comparison of age, gender, ASA classifications, height and weight between groups.

	SIFIB-0.20 (n: 15)	SIFIB-0.25 (n: 20)	p
Age (years)	56.3±12.9	63.9±11.5	0.09
Gender F/M	12/3	12/8	NA
ASA II/III	15/0	15/5	NA
Height (cm)	162.3±5.8	163.9±10.7	0.57
Weight (kg)	73.2±8.6	74.8±10.5	0.62

The data are presented as mean ± standard deviation or number.

In addition, there was no significant difference in NRS score and cumulative morphine consumption between the groups at the 3rd, 6th, 12th, 18th, and 24th hours ($p>0.05$). When the first analgesia requirement times were compared, there was no significant difference between Group-0.20 and Group-0.25 (221.3±112.8 and 216.7±123.1 minutes, respectively, $p>0.05$) (Table 2, Fig. 2). Rescue analgesics were not required in both groups, our multimodal analgesia regimen was sufficient.

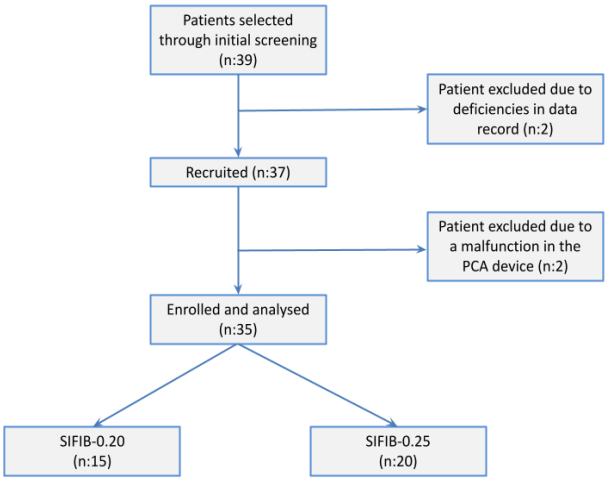
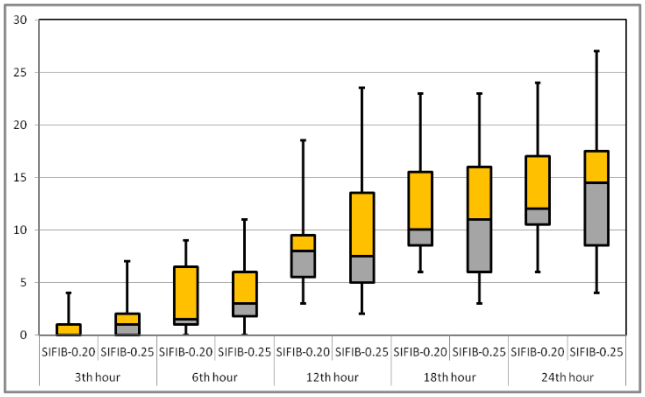


Fig. 1. The process from initial identification of patient files to inclusion is demonstrated.

Table 2. Comparison of groups in terms of pain intensity and cumulative opioid requirement.

	SIFIB-0.20 (n: 15)	SIFIB-0.25 (n: 20)	p
NRS-S			
3th hour	0(0-2.5)	2(0-4)	0.52
6th hour	3(2-4.5)	3.5(2-5)	0.44
12th hour	4(3-5.5)	3(1-4.3)	0.09
18th hour	4(3.6-5)	4(3-4.3)	0.20
24th hour	3(2-3.5)	4(3-5)	0.34
Cumulative morphine Consumption (mg)			
3th hour	0(0-1)	1(0-2)	0.24
6th hour	1(1-6.5)	3.5(1.75-6)	0.66
12th hour	8(5.5-9.5)	7.5(5-11)	0.82
18th hour	10(8.5-13.5)	11(6-16)	0.95
24th hour	12(10.5-17)	14.5(8.5-17.5)	0.92
The first analgesic demand time (minutes)	221.3±112.8	216.7±123.1	0.91

The data are presented as mean ± standard deviation or the median (percentiles 25–75).



Y axis: cumulative morphine consumption (mg), X axis: time frames, Box and lines indicate min, 1st quartile, median, 3rd quartile and max values.

Fig. 2. Box plot demonstration of morphine consumption at different time frames between groups.

4. Conclusions

Our study has shown that there was no difference in terms of postoperative analgesic properties between the use of bupivacaine at a concentration of 0.25% and the relatively lower concentration of 0.20% used in SIFIB performed at the end of hip surgery under spinal anesthesia. Postoperative pain scores, cumulative morphine requirements in PCA, and time to first analgesic requirement were similar between groups.

The postoperative efficacy of SIFIB in hip surgery has been demonstrated by several clinical studies [5–7]. In fact, there are articles reporting its use in hip fractures before spinal anesthesia for the purpose of relieving positioning pain [8]. However, in these studies, the local anesthetic concentration for bupivacaine is 0.25% in almost all single-shot SIFIB applications.

Using a low concentration of local anesthetic in peripheral nerve blocks and fascial plane blocks will both reduce the cumulative dose and therefore reduce the complication rate [9]. With low concentrations, it can be logically said that motor blockade can be observed relatively less [10]. The issue of providing safer analgesia by eliminating the risk of motor blockade with the use of bupivacaine in low concentrations has been well demonstrated in epidural analgesia [11]. Unfortunately, this clear distinction has not been sufficiently studied in fascial plane blocks and nerve blocks.

Being able to reduce local anesthetic concentrations gains importance especially in blocks such as SIFIB, where 40-50 mL of local anesthetic is used, which are desired to be spread over a large surface area. SIFIB is a volume dependent block like other fascial plane blocks. Studies have shown that high volumes are required (40 ml to 62.5 ml) to block all three of the femoral, obturator, and lateral femoral cutaneous nerves [12–14]. Lower concentrations become even more important when an additional block is required, or bilateral block is required.

Our study has some limitations. First, it is relatively bias-prone due to our retrospective design. Another limitation is the absence of an evaluation of the quadriceps weakness of the patients. Unfortunately, we could not perform dermatome analysis or skin mapping, as we performed the block procedures under spinal anesthesia. Both the duration of the first analgesia longer than expected and the lower analgesia requirement according to our clinical experience were two indirect indicators of block success. In our hospital, orthopedists do not recommend mobilization for the first 24 hours in hip surgeries. Therefore, we were not able to look at the NRS-dynamic values. This can be taken into account as another limitation of our study.

In conclusion, single shot SIFIB performed at relatively lower concentrations also has analgesic properties like the usual concentration of SIFIB with 0.25% bupivacaine.

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Research Article

Efficacy of bilateral ultrasonography-guided transversus abdominis plane block after laparoscopic sleeve gastrectomy: Prospective, randomized, controlled study

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ABSTRACT

Aim: Transversus Abdominis Plan (TAP) block is an interfascial plane block, commonly used as an analgesic technique in abdominal surgeries. The aim of this study is to investigate the postoperative analgesic efficacy of bilateral ultrasonography (US) guided TAP block in patients scheduled for laparoscopic sleeve gastrectomy.

Method: In this randomized prospective study; 48 patients, 18-65 years, ASA I-II, morbidly obese (BMI>35), underwent laparoscopic sleeve gastrectomy were included. The patients randomized into two groups: TAP block Group (group TAP) and Control Group (group C). At the end of the operation, bilateral TAP block were performed to 24 patients in Group TAP with a total 40 ml of local solution. 20 ml of local solution was injected into the trocar incision lines of all patients. Patient-controlled analgesia was administered to all patients at a dose of 5 mg/ml tramadol. Tramadol consumption, visual analogue scores (VAS) and the need of rescue analgesia (paracetamol) of the patients at postoperative first 24th hours were recorded.

Results: There is no statistical difference in terms of demographic data. Total tramadol consumption and VAS were significantly higher in the Group C ($p<0.01$). No complications were found in either group.

Conclusions: US-guided TAP block provides effective analgesia in patients underwent laparoscopic sleeve gastrectomy surgery.

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1. Introduction

The prevalence of obesity is increasing worldwide [1]. Globally, a total of 1.9 billion overweight and 609 million obese adults were estimated to be overweight and obese, nearly 40% of the world's population [2]. Obesity is a serious co-morbidity for patients. Several methods may be used for the treatment of obesity [3]. Since it is minimally invasive, bariatric surgery is one of the most commonly used method among the surgical approaches [4]. When postoperative pain is not adequately controlled, quality of life decreases and respiratory complications develop

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[5]. Perioperative pain management is specific in morbidly obese patients, and a multimodal postoperative pain strategy should be used effectively. Thus, the amount of opioid use decreases [6,7]. In morbidly obese patients, the risk of postoperative complications is high due to increased sedation, hypoventilation and immobilization due to opioid use in the postoperative period [8,9]. Enhanced Recovery after Surgery (ERAS) guidelines recommend minimally opioid using in obese patients who underwent bariatric surgery [10].

Transversus Abdominis Plane (TAP) block was defined by Rafi in 2001 as a local anesthetic injection performed by determining the Petit triangle between the transversus abdominis and internal oblique muscles [11]. TAP block provides analgesia as a part of multimodal pain control regimen. The Ultrasound-guided (US) TAP block is an interfascial plane block of the abdominal wall that provides somatic analgesia. Postoperative pain and opioid requirement decreased significantly in patients who underwent TAP block in other surgical branches [8,12,13].

In this trial; our aim was to investigate the analgesic efficacy of US-guided TAP block in the first 24 hours and the need for additional analgesia in patients with laparoscopic sleeve gastrectomy under general anesthesia.

2. Materials and Methods

After obtaining the approval of the ethics committee of Bezmialem Vakif University Faculty of Medicine (decision no: 71306642/050-01- 04/126); ASA I-II, planned for laparoscopic sleeve gastrectomy surgery, and morbidly obese (BMI>35) patients who were aged between 18-65 years included in the study. Written informed consent was obtained from the participants for the study. Patients with a history of drug allergy, ASA $\geqslant$ 3, chronic opioid and NSAID use, and infection in the skin area were excluded from the study. Randomization was performed by the closed envelope method.

2.1. Study groups and outcome measures

The patients were randomized into two groups. TAP block was performed before extubation at the end of surgery in Group TAP, the other group was non-intervention Control Group (Group C). The primary outcome of our trial; to compare the pain scores with visual analogue scale (VAS). Our secondary outcome is the use of opioid and rescue analgesic use in the postoperative period.

2.2. Intraoperative management

Routine ASA monitoring was performed in the patients. All treatments were calculated based on corrected body weight. A dose of 2 mg/kg propofol, 0.5-1 µgr/kg remifentanil, and rocuronium 0.6 mg/kg IV were administered for anesthesia induction. Mechanical ventilation is measured with 6 mL/kg tidal volume and PEEP 8 cmH2O parameters. During the maintenance of anesthesia, a dose of 8-10 mg/kg/hr propofol, 0.25 µgr/kg/min remifentanil IV were administrated. A dose of 50 mg ranitidine, 20 mg tenoxicam and 1 g paracetamol IV were administrated to patients in all groups.

2.3. Performance of transversus abdominis plan block (TAP)

In the TAP group (n: 24), after the surgical procedure was completed, before extubation, after asepsis was achieved in the supine position, TAP block was performed with a linear US probe (8-12 MHz), 150 mm block needle, with in-plane technique.

The transducer was placed in the middle of the iliac crest and costal border (Fig. 1). External oblique, internal oblique, transversus abdominis muscles and peritoneum were visualized (Fig. 2). 1 ml of saline was given to confirm the plan between the internal oblique muscle and the transversus abdominis muscle.

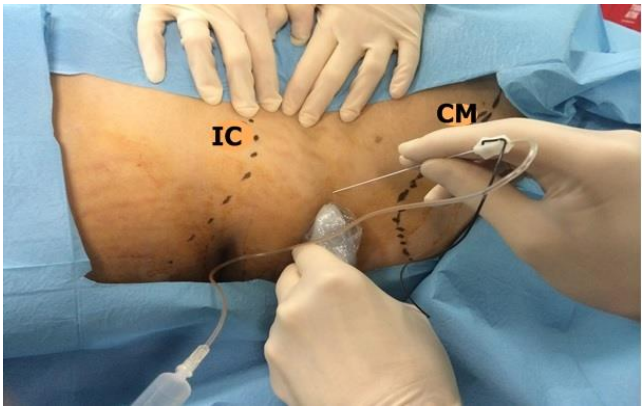

Fig. 1. Probe position and anatomical landmarks.
IC: Iliac crest; CM: Costal margin.

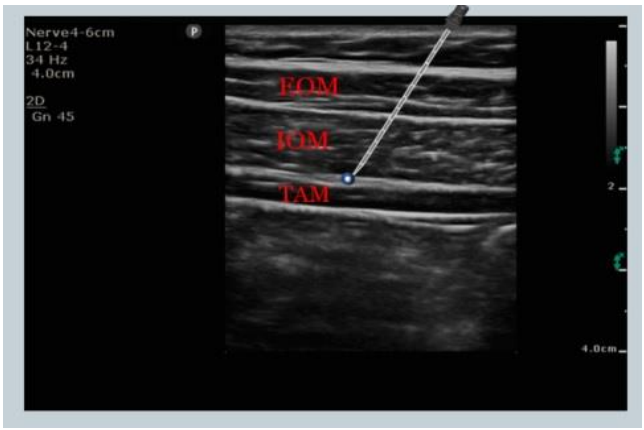

Fig. 2. Sonoanatomy of TAP block.
EOM: External oblique muscle, IOM: internal oblique muscle, TAM: Transversus abdominis muscle.

We prepared 0.5% bupivacaine at a dose of 1.5 mg/kg for block procedure. We diluted 0.5% bupivacaine at lower concentrations with normal saline. We used a mixture of bupivacaine and saline. After confirmation, 40 ml of local anesthetic solution was given bilaterally to the interfascial plane between transversus abdominis and internal oblique muscles.

All patients in the study were infiltrated into the trocar entry sites by the surgical team with 20 ml of local solution. We prepared 0.5% bupivacaine at a dose of 0.5 mg/kg for block procedure. We diluted 0.5% bupivacaine at lower concentrations with normal saline for local infiltration. The block and local solutions were prepared according to the corrected weight of the patients.

2.4. Postoperative analgesia protocol

Postoperative tramadol (5 mg/ml) patient-controlled analgesia (PCA) was administered to the patients; 4cc bolus, lock time 20 min (no infusion). If the VAS was above 4, 1 g paracetamol was used for rescue analgesic purposes.

2.5. Sample size analyses and statistics

The sample size of the study was calculated using the G*Power program (V.3.1.9 Heinrich-Heine- Universitat Dusseldorf, Germany) based on a pilot study with 8 patients in each group. The power analysis was based on VAS scores which was the primary outcome of the study. We considered a reduction in mean pain scores by two points to be clinically meaningful and important. The mean of VAS scores of the TAP group was 3 with SD=2 and, 5 with SD=3 in the control group. Assuming a two-sided type I error of 0.01, along with type II error of 0.10 which eventually brings a power of 0.90(1-β), 21 participants were needed per each group. Considering possible drop-outs, we decided to include at least 24 patients per group.

IBM SPSS Statistics 22 (IBM SPSS, Turkey) program was used for statistical analysis. While evaluating the study data, the conformity of the parameters to the normal distribution was evaluated with the Shapiro Wilks test. While evaluating the study data, in addition to descriptive statistical methods (mean, standard deviation, frequency), Student's t test was used for the comparison of normally distributed parameters between two groups, and Mann Whitney U test was used for the comparison of non-normally distributed parameters between two groups. Fisher's Exact Chi-Square test and Continuity (Yates) Correction were used to compare qualitative data. Significance was evaluated at the $p<0.05$ level.

3. Results

We used Consolidated Standards of Reporting Trials flow chart for the enrollment of the patients during the trial period (Fig. 3).

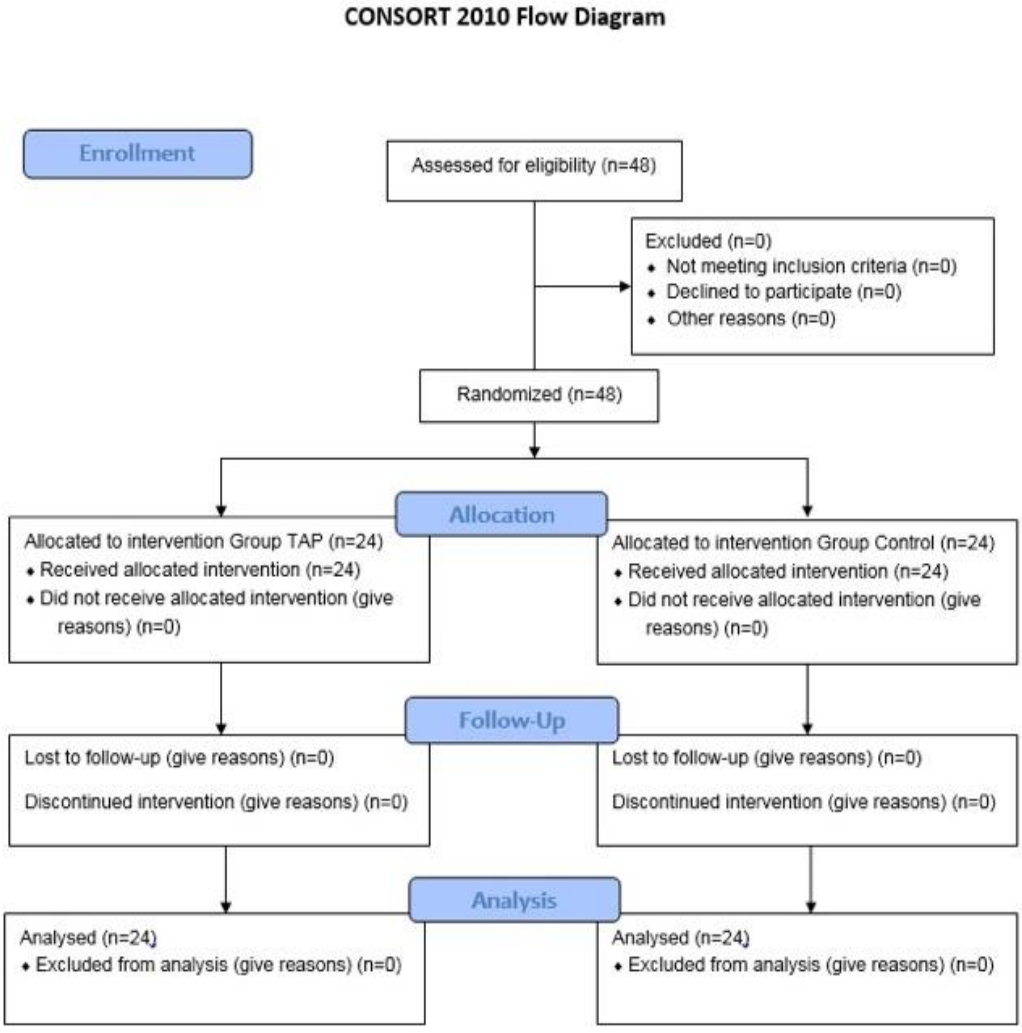

Fig. 3. The process from initial identification of patient files to inclusion is demonstrated.

The study was conducted between May and September 2014 on a total of 48 patients aged 19-64, 16 (33.3%) men and 32 (66.7%) women. The mean age of the cases was 37.54±11.30 years. The participants were randomized into two groups as TAP and groups C (n = 24 for each group). There was no statistically significant difference between the groups in terms of age, gender, weight, height, BMI, corrected weight averages, anesthesia duration and surgical time periods (p>0.05) (Table 1).

The VAS-rest and VAS-movement levels of the C group at the 30th minute, 2nd, 6th, 12th and 24th hours were found to be statistically significantly higher than the TAP group (p<0.05). (Table 2). Total tramadol consumption at 30th minute, 2nd, 6th, 12th and 24th hours and paracetamol usage rates at 30th minute, 2nd, and 6th hours in the C group were found to be significantly higher than the TAP group. (p<0.05) (Table 3). There were no complications in either group.

Table 1. Evaluation of the groups in terms of demographic characteristics.

	Group TAP (n: 24)	Group Control (n: 24)	p
Age (years)	36.33±12.07	38.75±10.6	0.465
Weight (kg)	136.25±20.98	137.42±23.01	0.855
Height (cm)	168.54±11.65	164.75±11.14	0.255
BMI (kg/m^2)	48.23±7.18	50.49±6.04	0.243
Adjusted weight (kg)	91.23±13.45	89.59±14.28	0.683
Gender F/M	15/9	17/7	0.759
Anesthesia time min)	137.67±14.7	141.08±17.46	0.467
Surgery tme (min)	98.5±12.76	98.17±17.74	0.941

The data are presented as mean ± standard deviation or number, kg: kilogram, cm: centimeter, min: minute, BMI: body mass index, Continuity (yates) correction was used for gender, Student t-test was used for other parameters.

Table 2. Evaluation of the groups in terms of VAS-Rest and VAS-Movement.

	Group TAP (n: 24)	Group Control (n: 24)	p
VAS-Rest			
30 min	4.96±0.75	6.58±0.88	0.001**
2nd hour	3.33±0.76	6.13±0.74	0.001**
6th hour	1.75±0.68	4.83±0.56	0.001**
12th hour	1.54±0.51	3.79±0.41	0.001**
24th hour	1±0	1.58±0.5	0.001**
VAS-Movement			
30 min	5.96±0.75	7.71±0.95	0.001**
2nd hour	4.33±0.76	7.21±0.66	0.001**
6th hour	2.54±0.72	5.79±0.59	0.001**
12th hour	2.46±0.51	5.21±0.72	0.001**
24th hour	1.42±0.50	2.38±0.49	0.001**

The data are presented as mean ± standard deviation. VAS: Visual analogue scale, Mann Whitney U test used **p<0.01.

4. Discussion

In our study, we compared the analgesic efficacy of bilateral TAP block + LA infiltration, to LA infiltration alone. According to the results, the pain scores, opioid consumption (tramodol), and the need for rescue analgesia (paracetamol) were significantly lower in the TAP group. Multimodal postoperative pain analgesia management may be used effectively after bariatric surgery.

Table 3. Evaluation of the groups in terms of total tramadol and paracetamol consumption.

	Group TAP (n: 24)	Group Control (n: 24)	p
Tramadol Consumption			
30 min	26.67±9,63	34.38±10.35	0.008**
2nd hour	95±25,19	222.5±40.99	0.001**
6th hour	175.83±48,63	327.5±40.78	0.001**
12th hour	271.67±48,6	426.67±52.97	0.001**
24th hour	354.17±48,09	531.67±58.66	0.001**
Paracetamol Consumption			
30 min	2 (%8,3)	18 (%75)	0.001**
2nd hour	1 (%4,2)	18 (%75)	0.001**
6th hour	0 (%0)	5 (%20,8)	0.049*
12th hour	0 (%)	0 (%0)	NS
24th hour	0 (%)	0 (%0)	NS

The data are presented as mean ± standard deviation or number. NS:Nonsignificant, Continuity (yates) correction and Fisher'sExact Test used * p<0.05, **p<0.01.

A multimodal analgesia regimen reduces the amount of opioid use in obese patients. The pain control contributes to the rehabilitation of patients [6,7]. Hebbard et al. described the TAP block under guidance of US [14]. It has been used effectively in laparoscopic surgeries, even in pediatric and neonatal patients [15,16]. In studies, the classical blind technique (loss of resistance) method and the US technique were compared [9,17]. It is very difficult to find guide points in morbidly obese patients. In obese patients with TAP block, palpation of the petit triangle is quite difficult. In recent years, regional anesthesia with the US technique provides safe and effective anesthesia in obese patients [12,13]. For these reasons, we preferred the US technique in our study.

Albrecht et al. [18] divided the cases undergoing laparoscopic gastric bypass into two groups and performed bupivacaine to TAP block and trocar inlets in 27 patients, and bupivacaine to only trocar inlets in 30 patients. Both 0-24 and 24-48 in opioid consumption in this study. There was no difference between operating hours and pain scores were similar. In this study, it was argued that TAP block application would be useless in the presence of local anesthetic agent performed to the incision lines. Although local anesthesia infiltration was performed to the surgical incision lines in all patients in our study, a significant difference was observed in pain scores and tramadol consumption amounts between the patients

between 0-24 hours. The different aspect of our study is that the TAP block application was performed immediately after the end of the surgery. Thus, the effectiveness of TAP block was felt more in the early postoperative period. In addition, the use of PCA contributed to the relevance of the study.

Sinha et al. [19] bupivacaine and TAP block were performed to one group and bilateral saline was performed to the other group in 100 patients who were scheduled for laparoscopic bariatric surgery. In the study, a significant decrease was found in the need for analgesics in the TAP block group within the first 6 hour postoperatively. It was determined that the pain scores of the patients were lower in the block group and the sedation values were significantly reduced. In our study, tramadol was consumed less in the TAP block group. Again, resting and mobile VAS were significantly reduced. In addition, placebo was not administered to the group that did not receive TAP block in our study. We did not observe any complications in any of our patients who underwent block. Wasseef et al. [20] studied 35 patients who underwent single-port laparoscopic bariatric surgery. Postoperatively, only iv PCA and hydromorphine were performed to 25 patients, postoperative TAP block was performed to 10 patients, and postoperative iv PCA was given to hydromorphine. Sensory blocks T5-L1 dermatome levels were detected and no difference was observed between the two groups in 24-hour opioid consumption. In our study, dermatomal areas of sensory block were not detected, but a significant decrease was detected in both VAS scores and postoperative analgesia consumption in the TAP group.

Another fascial plane blocks such as oblique subcostal transversus abdominis plane (OSTAP) block, thoracoabdominal nerve block through perichondrial approach (TAPA) block, and erector spinae plane block (ESPB) may be used for abdominal analgesia and postoperative pain control after bariatric surgery [21–25]. OSTAP was modified from the subcostal TAP block by Hebbard et al. [25]. OSTAP has some difficulties such as longer needle and larger volume of LA (50-80 ml) are needed. OSTAP provides analgesia between T6-L1 levels, and it targets anterior cutaneous branches. TAPA block is a novel abdominal interfascial plane block [22,23]. It is performed over and underside of the costal cartilage. It provides effective abdominal analgesia by targeting anterior and lateral cutaneous branches. ıt was reported that modified TAPA provided effective analgesia in patents underwent sleeve gastrectomy surgery [23]. Erector spinae plane block (ESPB) is a technique that LA is administrated deeply to the erector spinae muscle over the transverse process of vertebrae. T9-T10 ESPB provides abdominal analgesia. It was reported that ESPB provided postoperative analgesia after bariatric surgery [24].

This trial has several limitations. We performed 40 ml volume of LA for TAP block. Further studies may be performed with different volumes. As another limitation, we did not evaluate the dermatome levels.

5. Conclusions

In conclusion, US-guided TAP block provides effective analgesia in patients underwent laparoscopic sleeve gastrectomy surgery. It may be used as a part of multimodal analgesia management in obese patients. Further studies with larger sample size are needed to better evaluate the efficacy of TAP block.

Author Contributions

All authors have made significant contributions to the design or data acquisition or analysis and interpretation of data; were involved in the drafting or critical review for important intellectual content; gave final approval of the version to be published.

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Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this manuscript.

Data availability

The datasets created and/or analyzed during the current study are not publicly available, but are available from the corresponding author upon reasonable request.

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Challenge Journal of Perioperative Medicine

Research Article

Instagram: A platform for caudal epidural injection?

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ABSTRACT

Aim: Caudal epidural injection (CEI) is a widely used procedure in pediatric anesthesia for perioperative pain and in adults for chronic radicular pain. Social media platforms, including Instagram, are being increasingly utilized for the dissemination of information in various fields, including medicine. The aim of this study was to evaluate the information content and sources of CEI on Instagram.

Method: This study presents an analysis of Instagram contents containing the keywords #caudalepiduralinjection, #caudalepidural, #caudalepiduralblock, #caudalinjection, and #caudalblock on May 1, 2023. The results were classified into four groups based on the source: posts generated by physicians, organizations, patients, or unspecified sources. The posts were further classified into two categories: educational or experience. User influence was also assessed based on the number of followers and posts.

Results: A total of 204 posts were assessed. 72 different accounts were identified and the distribution of these accounts is as follows: physicians accounted for 29.16% (n=21), patients accounted for 51.38% (n=37), medical organizations accounted for 11.11% (n=8), and the remaining 8.33% (n=6) were not otherwise specified. Among the posts, 92 (45.09%) were posted by the patients, 71 (34.80%) were posted by physicians, 25 (12.25%) by medical organizations, and 16 (7.84%) were not specified. There was a significant difference in the number of posts created by patients versus physicians (p=0.036). Furthermore, there was a significant difference in the number of followers between physicians and all other groups analyzed. There were no posts regarding the use of CEI in pediatric anesthesia when searching for posts on CEIs.

Conclusions: When searching for posts related to CEIs, it is more likely to encounter posts authored by patients, thus resulting in the educational content created by physicians being overshadowed and buried among numerous other posts. We suggest posting educational medical content with the hashtag #MedEd in an attempt to make educational content more easily accessible. These findings highlight the importance of raising awareness about CEIs on Instagram. Pain medicine societies and specialists should actively contribute by sharing credible posts on CEIs.

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1. Introduction

The caudal epidural injection (CEI) procedure involves inserting a needle through the sacral hiatus in order to administer local anesthetics and/or steroids into the epidural space [1]. This method of accessing the epidural space is commonly utilized for perioperative analgesia in the pediatric population, as well as being a favored technique for managing various chronic pain conditions in adults. Patients experiencing chronic low back pain accompanied by radicular pain resulting from disc herniation or radiculitis, and who have not shown im-

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provement with conservative treatment, can be candidates for CEI. This procedure becomes particularly beneficial when challenging anatomical factors exist in the lumbar spine, such as prior lumbar surgery or degenerative changes, which restrict access to the epidural space via transforaminal or interlaminar approaches [2,3].

Emergence of the Internet has brought about a transformative revolution, leading to remarkable advancements in education and the wide distribution of medical information. Among the various social media platforms, Instagram stands out as a highly popular image-based site boasting a user base of over 1 billion [4]. Considering the distinct significance of visuals in effective communication and message framing, platforms like Instagram and other visually-oriented mediums hold immense potential in the realm of health communication and medical information. Prior studies have established that messages containing visual elements are retained more effectively, have better long-term memory recall, and are more accurately remembered compared to messages composed solely of textual content [5,6]. Patients often turn to social media to gather information about medical procedures, seeking insights from real patients. Online sharing of medical experiences by patients has facilitated the creation of support networks. Through the utilization of hashtags, patients are able to conveniently access posts related to their specific disease from other patients and medical professionals. However, it is important to note that multimedia platforms may present inaccurate information, that can impede patients' and their relatives' ability to make well-informed decisions regarding the management of their disorders [7,8].

CEI is one of the most common procedures performed in acute and chronic pain treatment. Instagram is a popular media-sharing platform and considered as an important platform for online health information. This present study aims to provide an evaluation of the information on CEIs on Instagram from different perspectives including number of posts, number of followers, content of post being educational or exchanging experience.

2. Materials and Methods

This study was conducted as a descriptive analysis of Instagram searches related to CEIs. There was no human or animal involvement in the conduction of this study. As a result, the data used in this study was publicly available; hence there was no need for ethics committee approval.

The study was conducted on May 1, 2023, by searching for the hashtags #caudalepiduralinjection, #caudalepidural, #caudalepiduralblock, #caudalinjection and #caudalblock on Instagram. Only posts in English were included in the analysis, and duplicate posts were excluded. The posts were categorized as physicians, patients, medical organizations or unspecified categories. The information in the posts was further categorized based on its type, either educational content for healthcare professionals or experiences, and the influence of the users, measured by the number of posts and followers. The distribution of followers and the number of posts among users were also analyzed.

2.1. Statistics

For the statistical analysis, SPSS 20 was used. The quantitative variables were tested for normality using the Shapiro-Wilk test. Descriptive statistics such as numbers (n), frequencies (%), mean, and standard deviation (SD) were used to present the data. The Kruskal-Wallis test was employed to determine if there were any significant differences in the distribution of follower numbers and the number of posts among the four groups. If the overall test yielded a significant result, pairwise comparisons were conducted using the Wilcoxon signed-rank test. A significance level of $P < 0.05$ was considered statistically significant.

3. Results

A total of 204 Instagram posts were assessed, and the process for selecting these posts was illustrated in Fig. 1. Out of the evaluated posts, 72 different accounts were identified and categorized into four groups: physicians, medical organizations, patients, and not otherwise specified.

The distribution of these accounts is as follows: accounts by physicians 29.16% (n=21), accounts by patients 51.38% (n=37), accounts by medical organizations 11.11% (n=8), and the remaining 8.33% (n=6) were not otherwise specified, as shown in Table 1.

Regarding the origin of the 204 posts, 92 (45.09%) were posted by patient accounts, 71 (34.80%) by physician accounts, 25 (12.25%) by medical organizations, and 16 (7.84%) were not specified, as presented in Table 2.

The 50.7% of the posts shared by physicians consisted of educational content, while the 49.3% of them were posts on personal experiences. Analyzing the content of hospital-related posts thoroughly, it was found that 96% of them were educational content while only 4% were on personal experiences, as displayed on Table 2. All posts regarding CEI procedures were related to chronic pain conditions, and there were no posts about pediatric patients.

Table 1. Attributes of Instagram post.

User	Number of accounts	Number of followers (mean±SD)
Physicians	21 (29.16%)	407,964 (19426.85±11791.57)
Surgeon	16 (76.19%)	288,250 (18015.62±11286.59)
Non-surgeon	5 (23.80%)	110,751 (22150.2±9774.96)
Patients	37 (51.38%)	23,082 (623.86±7132.50)
Medical organization	8 (11.11%)	4,418 (552.34±1216.22)
Not otherwise specified	6 (8.33%)	1,520 (253.42±142.18)

Values are presented as numbers (%), SD: standard deviation.

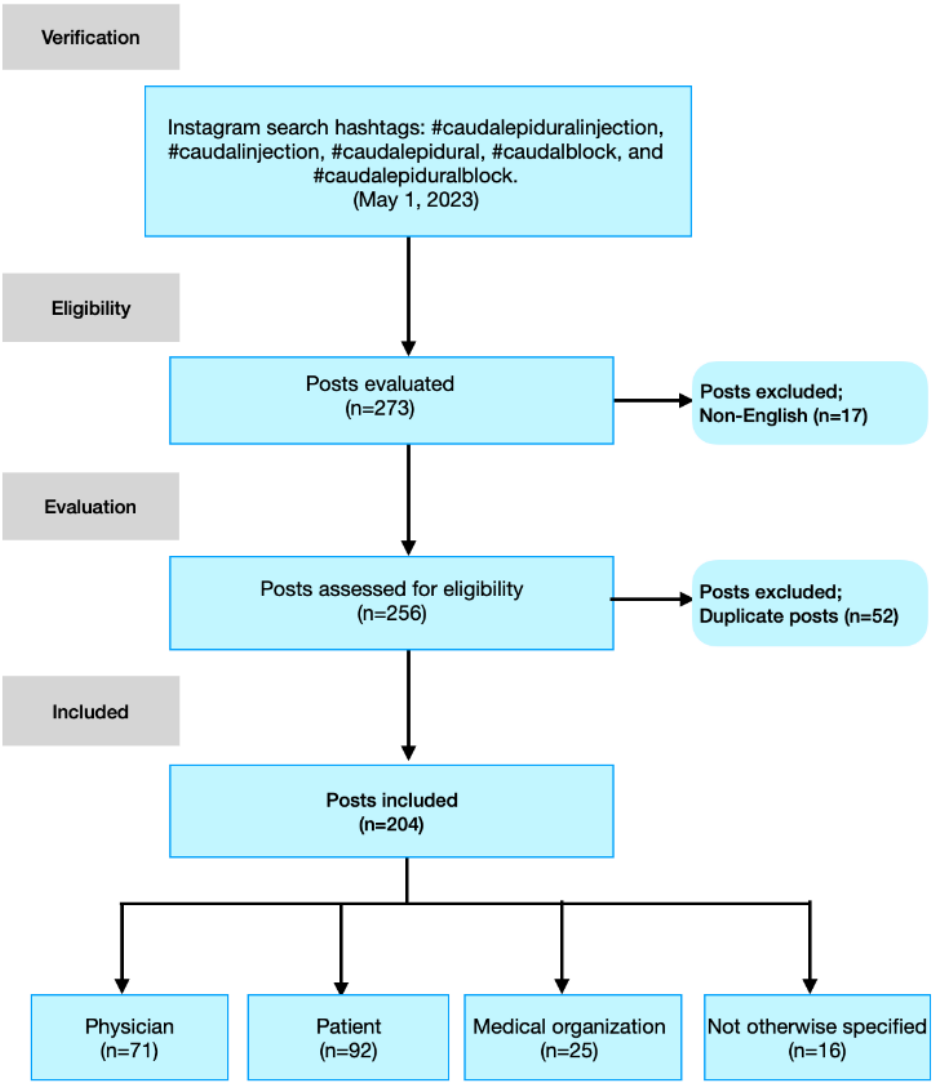

Fig. 1. Selection of the posts.

Table 2. Analyzing the content of posts.

User	Total number of posts (mean±SD)	Educational	Experiences
Physician	71 (3.38±2.05)	50.7%	49.3%
Surgeon	49 (3.06±1.57)	34.68%	65.30%
Non-surgeon	22 (4.4±2.43)	86.36%	13.63%
Patient	92 (2.48±1.16)	-	-
Medical organization	25 (3.12±0.25)	96%	4%
Not otherwise specified	16 (2.66±0.74)	-	-

SD: standard deviation

Table 3. Difference in numbers of posts and numbers of followers.

	Number of posts (p-value)[a]	Number of followers (p-value)[a]
Physician vs patients	0.036*	<0.001*
Physician vs medical organization	0.574	<0.001*
Physician vs not otherwise specified	0.411	<0.001*
Patients vs medical organization	0.131	0.954
Patients vs not otherwise specified	0.625	0.754
Medical organization vs not otherwise specified	0.194	0.513

*p<0.05 is considered statistically significant.

[a] Wilcoxon sign rank test was performed for pairwise comparison.

The study also examined the distribution of follower counts among four distinct groups. Pairwise comparisons revealed significant differences in number of posts created by patients versus physicians (p=0.036). Furthermore, there was a significant distinction in number of followers, as presented in Table 3.

4. Conclusions

This study aimed to investigate the presence of CEIs on the rapidly expanding social media platform, Instagram. The findings revealed that accounts by physicians were the most popular ones which were also the most focused

accounts on sharing educational content. Although physicians were actively engaged on social media, it was observed that posts related to CEIs were more commonly created by patients rather than medical professionals.

Over the past few decades, there has been a growing popularity of regional anesthesia in pediatric patients, with approximately one-quarter of anesthetic procedures conducted on children involving regional anesthesia [8]. A variety of peripheral and central nerve blocks have made it possible to reduce the dose of opioids, thus providing decreased complications related to opioids and improved haemodynamic stability [9]. Among them are single-injection CEIs, accounting for 34-40% of patients in pediatric regional anesthesia [8,10]. It serves as an adjunct to general anesthesia and also offers postoperative pain relief for pediatric patients who have undergone procedures below the umbilicus. The two largest multicentre trials investigating the incidence of regional anesthesia in pediatric patients reported that CEIs are most commonly administered to children aged between 12 months and 3 years [8,10]. Moreover, the caudal block is considered the primary choice for pain control due to its simplicity, high success rate and ability to provide consistent analgesia.

This current study has shown that there were no posts regarding the use of CEI in pediatric anesthesia when searching for posts on CEIs. Several studies have shown that families may have difficulty in accessing trustworthy and comprehensible information over the internet [11–13]. Given that CEI is frequently performed in pediatric patients, recognizing and determining the term 'caudal epidural injection' for children's families is an important issue. Accurate and reliable information is particularly crucial, especially considering that families hold the responsibility of making decisions for pediatric patients. To enhance the quality of online information regarding CEIs, it is essential for professional pain medicine societies and specialists to share credible posts. These posts should contain accurate information, accompanied by clear, high-quality images and videos, along with appropriate scientific commentary.

The popularity of social media platforms like Instagram is continuously increasing. This has led to the dissemination of medical information through Instagram, which has become a significant information source for patients who are deciding whether or not to undergo recommended treatments by healthcare professionals. However, our research reveals that the public is more likely to come across posts created by patients. Similarly, previous studies examining the impact of social media on health information found that the posts were mostly generated by patients and involved the sharing of personal experiences [14–16]. Overall, patient experience can serve as a valuable resource for individuals seeking feedback on interventional procedures. Exploring the documented experiences of patients who have undergone CEIs on platforms like Instagram can offer insightful information to prospective patients seeking real-life perspectives on these interventions. However, it is important to note that patient's viewpoints may be influenced by personal biases, potentially leading to the spread of unfiltered and often inaccurate information. Moreover, the lack of posts authored by physicians or medical organizations suggests a missed opportunity to provide reliable and trustworthy information regarding CEIs. Physicians and professional societies have a crucial responsibility to serve balanced and unbiased information regarding CEIs. Providing accurate and reliable medical information through social media platforms is essential in ensuring that patients have the necessary knowledge to make appropriate decisions about their healthcare.

Recently, E-Learning approaches such as video and image have become one of the most important parts of education [17–21]. Previous research has provided compelling evidence that utilizing visual sources for learning offers numerous advantages compared to traditional didactic training methods, particularly in various areas of medical education, including regional anesthesia [22]. Due to its image-based nature, Instagram serves as an ideal platform for the widespread dissemination of interventional medical education. Our findings indicate that more than half of the physicians' posts were educational; however, the use of hashtags in social media posts led to the educational content being overshadowed and buried among numerous other posts. We suggest posting educational medical content with the hashtags such as #MedEd or #MedEdu to make educational information more easily accessible. The fact that anyone can post and users may protect their identity raises questions of validity. It remains the responsibility of social media users to scrutinize any content before incorporating it into their practice. The General Medical Council (GMC) in the UK has provided guidance on the use of social media by healthcare professionals, emphasizing confidentiality and professionalism [23]. Apart from confidentiality and professionalism concerns, the information shared in posts may be accessed by patients who might use it for self-diagnosis and self-treatment.

There are several limitations in this article. Firstly, the evaluation was conducted within a single day, which may have overlooked ongoing discussions and conversations that occur on Instagram, given its dynamic nature. Furthermore, alternative keywords related to CEI could have been explored during the search process. The absence of demographic information is another notable limitation, as Instagram does not provide these variables for analysis. Additionally, this study solely focused on English posts, although English is widely used as a global language and can gather information from around the world. Lastly, since patients may seek information on platforms other than Instagram, it is essential to conduct further research that evaluates and compares various platforms. The findings cannot be generalized to other social media platforms as Instagram was the only platform analyzed.

The increasing use of the Internet for information and medical education brings about challenges due to the variability of information online. Our results show that posts created by patients are more likely to be encountered when searching for information on CEIs. Given the accessibility of Instagram, it can serve as a valuable platform for medical information on interventional procedures. Moreover, CEI is frequently performed in pediat-

ric anesthesia, recognizing and determining CEI for children's' families is an important issue. Therefore, it is important to encourage reliable Instagram accounts established by reputable pain medicine organizations to create more online information that explicitly states learning objectives related to CEIs. Further studies are warranted to explore the complete range of possibilities offered by Instagram as a tool for health communication and medical education in the field of interventional procedures.

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Challenge Journal of Perioperative Medicine

Case Report

Pericapsular nerve group (PENG) block as a sole anesthetic method for malignant soft tissue excision

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ABSTRACT

Since its first description by Philippe WH Peng in 2018, the Pericapsular Nerve Group (PENG) block, a novel regional anesthetic procedure, has been gaining in popularity. In order to provide appropriate analgesia, an ultrasound-guided local anesthetic injection around the hip joint is performed.

We presented, in this case, the successful management of the PENG block for surgical anesthesia in the excision of a malignant soft tissue tumor in the proximal tibia of a 73-year-old female patient. Adequate sensory and motor blocks were obtained, allowing a 70-minute surgery without using additional analgesics. Postoperative pain scores were low, and the patient was discharged without complications.

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1. Introduction

Pericapsular Nerve Group (PENG) block is a relatively novel regional anesthesia technique that has gained increasing popularity in recent years. The PENG block is an injection that is given peri-capsularly around the hip joint under ultrasound guidance. It was first described in 2018 for analgesia after hip fractures [1]. The anterior inferior iliac bone and iliopubic eminence are used as the anatomical landmark. Local anesthetic is injected under and into the fascial layers that separate the iliopsoas muscle from the bone surface. The hip joint capsule is innervated by the femoral nerve and also several smaller nerves as the articular braches of the femoral, the articular branches of the obturator and the accessory obturator nerve that supply the anterior capsule. The quadratus femoris nerve supplies the posterior capsule.

In this case, we present the application of PENG block for successful surgical anesthesia in the excision of malignant soft tissue in the proximal tibia. Written consent was obtained from the patient for the publication of the article.

2. Case Report

A 73-year-old 80 kg female patient with ASA-III, a medical history of coronary artery disease, hypertension and atrial fibrillation had a mass measuring 15x11x7.6 cm in the medial right proximal tibia. Mass excision was planned for the patient. Due to the location of the lesion and comorbidities, we decided to perform PENG block for surgical anesthesia. Standard monitoring was performed on the patient in the operating room. The US probe (Xperius®, B Braun-Philips, C5-2 broadband curved array transducer, Melsungen, Germany) was covered with a sheath under aseptic conditions. After the anterior inferior iliac spine was palpated, a convex probe was placed transversely on it. The probe was then rotated 45 degrees to visualize the pubic ramus. The pectineus, iliopsoas muscle, and femoral artery were visualized. After 2 ml saline injection to confirm the correct spreading then, a 100mm ultrasound visible needle (Stimuplex® Ultra 360®, B Braun, Melsungen, Germany) was inserted lateral to medial and 30 ml of local anesthetic (15 ml 2% lidocaine, 15 ml 0.5% bupivacaine) was injected between the psoas tendon and the pubis ramus. After approximately 20

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minutes, sensory tests (cold test) of the femoral nerve, obturator nerve, and lateral femoral cutaneous nerve dermatomes provided adequate anesthesia. Motor block also occurred in the patient. Motor block tested with quadriceps weakness of the thigh. The surgical procedure was started 30 minutes after the block procedure. A total of 1 mg of midazolam and 40 mg of propofol were administered for sedation throughout the surgery. The operation lasted 70 minutes. During the operation, the patient did not need additional analgesics. IV paracetamol was administered every 6 hours postoperatively. The VAS score was recorded as 0 during the first 6 hours in the postoperative follow-up. In the first 24 hours, the highest visual analog score (VAS) was 3. The patient was discharged the next day without any problem (Fig. 1).

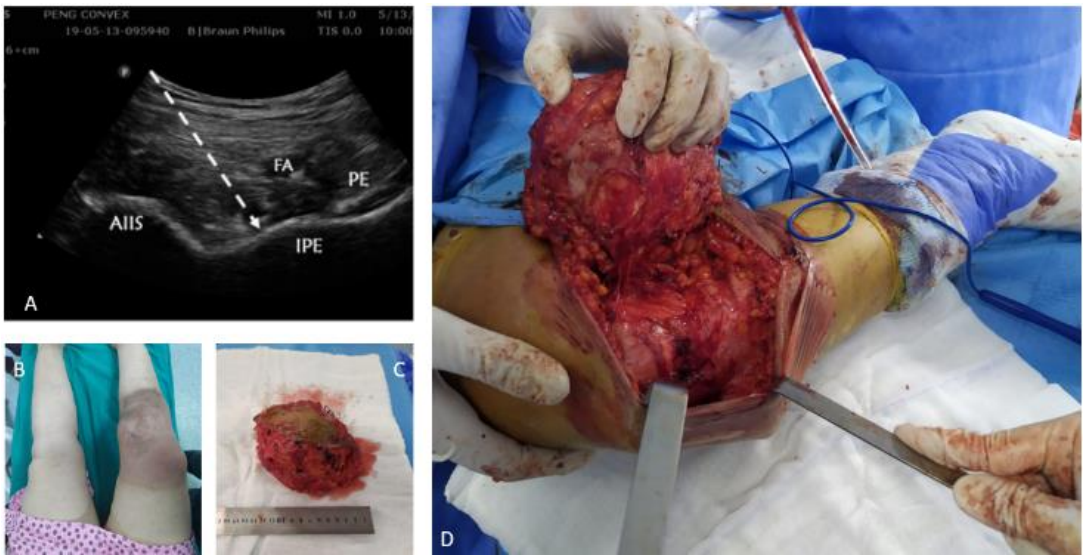

Fig. 1. (a) Sonographic anatomy. AIIS: anterior inferior iliac spine, FA: Femoral artery, PE: pectineus muscle, IPE: iliopubic eminence; (b) Surgical areas of patient; (c) Excisional mass; (d) Surgical area and a mass in the proximal medial tibia.

3. Discussion

The use of regional anesthesia techniques, including peripheral nerve blocks, has been increasing in popularity in recent years due to their potential benefits in terms of pain management and reducing the need for opioids. The application of PENG block for surgical anesthesia in the excision of malignant soft tissue in the proximal tibia, as described in this case report, highlights the potential versatility and efficacy of this relatively new regional anesthesia technique. Successful utilization of the PENG block for surgical anesthesia in this case suggests that it may be a viable alternative to more traditional anesthesia techniques, particularly for patients with medical comorbidities or those at high risk for complications from general anesthesia. Adopting Enhanced Recovery After Surgery (ERAS) protocols has yielded favorable outcomes such as shortened hospital stays, decreased incidence of complications, and reduced costs. Additionally, using the PENG block has facilitated earlier ambulation and opportunities for physiotherapy, resulting in reduced motor deficits and improved patient satisfaction [2].

Recent studies have shown that PENG block performed at high volumes will also reach the lateral and block the lateral femoral cutaneous nerve. Studies are stating that it can have the same effect as the lumbar plexus block. This extends the indications for the PENG block to the more distal parts of the lower extremity. Studies have shown that successful results are obtained in mass excisions in the medial thigh, varicose surgery, and fixation of ankle fractures [3–5]. Local anesthetic dissemination has been demonstrated by cadaveric studies [6,7]. These findings support the notion that PENG block has the potential for broader application, beyond its initial description for hip fracture analgesia. A meta-analysis of five randomized controlled trials showed that PENG block positively affected pain scores by reducing opioid consumption after hip surgery [8]. Despite certain limitations regarding using this block in pediatric patients, a study has reported the safe implementation of PENG block in two children undergoing surgery for hip dysplasia [9].

In addition to providing preoperative analgesia, PENG block can offer effective surgical anesthesia in appropriate dermatomal regions. As a result of the fact that this method is still relatively new, there is ongoing discussion on the optimal injection point, the optimal anesthetic concentration, and the total volume that should be injected. The scope and application of the PENG block can be expanded proportionately to the concentration and volume of the administered local anesthetic, thereby broadening its potential indications and areas of use. Nonetheless, additional randomized clinical trials and cadaveric and radiographic studies are necessary to determine the efficacy of PENG block. Additionally, comparisons with existing regional anesthesia techniques would provide valuable information regarding the relative advantages and disadvantages of PENG block in various clinical contexts.

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Case Report

Spinal anesthesia in a patient with Darier's disease: A case report

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ABSTRACT

Darier's Disease (Darier-White Disease, keratosis follicularis) is a rare genodermatosis characterized by keratinisation defects that affects the skin, nails and mucosal membranes; it is autosomal and dominantly inherited. To the best of our knowledge, only one case has been reported regarding spinal anesthesia management in a patient suffering from Darier's disease—this was during Cesarean section. Here, we describe a case of spinal anesthesia with standard skin preparation for inguinal hernia surgery in a Darier's patient. Spinal anesthesia is a safe anesthesia choice when administered in lesion-free areas.

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Introduction

Darier's disease (Darier-White Disease, keratosis follicularis) is a rare genodermatosis characterised by keratinisation defects, which affect the skin, nails and mucosal membranes; it is autosomal and dominantly inherited [1,2]. The worldwide prevalence is thought to be between 1/30,000 and 1/100,000 [1]. It is rarely symptomatic at birth, and usually presents in the first or second decade of life [3]. Darier's Disease's skin lesions and their potential for secondary infections may be problematic during spinal anesthesia. To the best of our knowledge, there is one case report in the literature describing spinal anesthesia in a patient with Darier's Disease. In that case, skin preparation before spinal anesthesia was performed using cetrimide, chlorhexidine and isopropyl alcohol [4]. Here, we report a case of spinal anesthesia with standard skin preparation in a Darier's Disease.

Case Report

A 49-year-old-male patient (weight 65 kg, height 170 cm) with a right-sided inguinal hernia was consulted in our preoperative preparation clinic. The patient had a medical history of postoperative atelectasis after general anesthesia for tonsillectomy 12 years prior. His father and sister also had Darier's Disease. He had a history of smoking 60 pack/years. On physical examination, there were brown fatty hyperkeratotic lesions over most of his body including his nail beds. There were no signs of skin infection in the spinal area. There were no lesions on his oral mucosa. His other systemic findings including laboratory results and electrocardiogram were normal. He had a mild restrictive pattern on a respiratory function test. He was classified as American Society of Anesthesiology (ASA) Physical status 2 and Mallampati 2. The patient's informed consent was taken after spinal and general anesthesia was explained. Due to his previous experience with postoperative atelectasis, it has been decided to perform the surgery under spinal anesthesia. No evidence of secondary infection was found on swabs taken from lesions on his back. The swab sample had already been taken by dermatologists during the preoperative preparation period (48 hours ago). Although there is no consensus, it can be said that it should be taken within a few days.

The patient's electrocardiogram, blood pressure and O2 saturation were monitored. An 18-g cannula was used for IV access on the left dorsum of the hand and an isotonic saline solution was administered at 10 ml/kg. Hemodynamic parameters were normal and the SpO2 was 96-98% throughout the procedure. The patient was placed in the sitting position. There were papular lesions on the vertebral and paravertebral region, but none at the L3-L4 level. The skin was prepared with chlorhexi-

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dine and isopropyl alcohol. A 25-g spinal needle was used, and 12 mg of bupivacaine was administered to the subarachnoid space. After spinal anesthesia, the patient's head and shoulders were kept at a 30-degree angle.

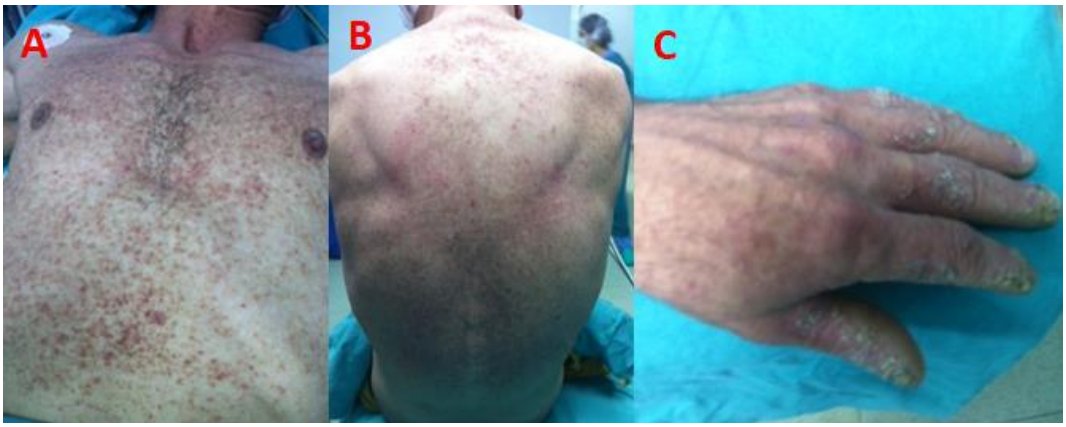

Fig. 1. Presentation of Darier's disease in our patient: (a) Lesions of thoracoabdominal region, anterior aspect; (b) Lesions of thoracodorsal region, posterior aspect; (c) Patients left hand and lesions.

We used a pin prick to measure sensory and motor blockage. Sensory block was achieved at 10th minute to dermatome T10. The patient's surgery lasted 60 minutes. His hemodynamics was normal, and SpO2 was over 96% throughout the procedure. There were no postoperative complications due to spinal anesthesia. The patient was externalised at postoperative 30th hour and at postoperative 5th day, there was no evidence of complications including skin infection. There were no neurologic or neuraxial anesthesia-related complaints.

4. Discussion

Darier's disease is a rare dermatological disease caused by the mutation of ATP2A2 gene located in area 12q23-q24 on the first chromosome [1]. It is commonly seen in the first or second decade of life. Our patient's first symptoms appeared at 17 years of age. Darier's disease is characterised by converging papular lesions in the seborrheic areas of the face, torso and back with nail bed involvement seen in all patients [4]. Our patient demonstrated widespread lesions. (Fig. 1) Secondary bacterial, viral and fungal infections can be seen on these lesions, leading to malodorous lesions of the scalp and genital area [1]. Our patient had a history of malodorous lesions during the summer months but none were present at this time. Patients with Darier's disease may also show psycho-neurological pathologies [5]. This was not seen in our patient.

Darier's disease is known to flare up with heat, perspiration, humidity, sunlight, corticosteroid use and mechanical trauma [5]. We believe it is therefore important for patients to protect themselves from sunlight and to use oral or IV corticosteroids preoperatively. During the procedure, anesthesiologists and surgeons should avoid the lesions.

Sharma et al. [4] reported the use of spinal anesthesia for Cesarean section in a 26-year-old woman with Darier's disease who presented with cephalopelvic discordance. The authors reported that cetrimide, chlorhexidine and isopropyl alcohol were safe to use for skin preparation before spinal anesthesia in areas with no lesions or secondary infection.

We selected chlorhexidine and isopropyl alcohol to prepare the site of spinal anesthesia. There were no lesions or secondary infections in this area. There were no postoperative complications related to spinal anesthesia. Similar to Sharma et al. [4], we believe that spinal anesthesia in areas without a lesion is safe.

Sharma et al. [4] used cetrimide, chlorhexidine and isopropyl alcohol possibly with the aim of minimizing infectious complications caused by neuraxial blockade. We did not find any literature describing the use of cetrimide for preoperative skin preparation in spinal anesthesia. Many studies have demonstrated the benefits of chlorhexidine and isopropyl alcohol for skin preparation before neuraxial blockade [6,7]. In light of these studies, we used chlorhexidine and isopropyl alcohol for skin antisepsis. We do not believe that there is a need for cetrimide.

In conclusion, Darier's patients can safely undergo spinal anesthesia with standard skin preparation techniques when administered through lesion-free areas with no evidence of secondary infection.

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