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Comparative Study between Ultrasound Guided Anterior and Posterior Approaches of Quadratus Lumborum Block in Extracorporeal Shock Wave Lithotripsy

Mohamed Gomaa Abd Elmohsen Elsaid *; Mohamed Samy Sharaf; Ahmed Mohammed Abo El Ata

Department of Anesthesia, Intensive Care and Pain Management, Damietta Faculty of Medicine, Al-Azhar University, Damietta, Egypt.

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*****Corresponding author

Email: mohamed.gomaa7777@gmail.com

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ABSTRACT

Background: Quadratus Lumborum Block [QLB] has emerged as a promising analgesic technique for providing effective pain relief during various surgical procedures. Nevertheless, the results pertaining to QLB in urological surgeries have shown variability in terms of the impact of QLB on postoperative pain relief and occurrence of side effects.

Aim of the work: This work aimed to compare the analgesic efficacy of ultrasound-guided anterior and posterior approaches of QLB for postoperative pain management in patients undergoing Extracorporeal shock wave lithotripsy [ESWL].

Patients and methods: This randomized clinical trial included 60 patients scheduled for ESWL. They were randomly allocated into two groups. Patients in group A [n=30] received ultrasound-guided anterior QLB, while group B [n=30] received posterior QLB. Visual analog scale [VAS] pain scores was assessed at 4 hours' intervals for 24 hours and additional analgesic requirement in first 24 hours were recorded.

Results: Regarding the Visual Analog Scale [VAS], there was no statistically significant distinction between groups in terms of pain alleviation within the initial 12 hours after surgery [$P > 0.05$]. However, group A exhibited notably superior pain relief compared to group B from 12 to 24 hours postoperatively [$P < 0.001$]. In terms of the Post Anesthetic Discharge Score [PADS], group A demonstrated significantly higher scores than group B from 2 to 24 hours following the surgery [$P < 0.001$].

Conclusion: Ultrasound-guided anterior approach of QLB provided superior postoperative analgesia compared to posterior approach in patients undergoing ESWL, as evidenced by less rescue analgesic requirement in first 24 hours. Anterior QLB can be considered the preferred technique for pain management in ESWL.

Keywords: Ultrasound; Conduction Anesthesia; Extracorporeal Shockwave Therapy; Urinary Calculi

INTRODUCTION

Urinary stone disease [urolithiasis] is a prevalent condition that is on the rise [1]. Treatment approaches differ based on the size and placement of the stone. Extracorporeal shock wave lithotripsy [ESWL] is commonly employed for treating stones located in the kidneys and upper ureter [2]. This outpatient procedure, which is non-invasive, is typically used. Although it is non-invasive, the technique relies on powerful acoustic shock waves and can be quite uncomfortable. The level of pain experienced in ESWL is influenced by various factors including the specific lithotripsy method, the stone's size and placement, the intensity and frequency of the shock waves, as well as the patient's age and gender [3]. Fragmentation can only be achieved by administering shock waves at the right intensity and duration. Most patients require sedoanalgesia to undergo this procedure due to an inability to tolerate it without [4].

Different approaches have been used for pain control during ESWL, including systemic medications like non-steroidal anti-inflammatory drugs, opioids, or alpha-2 agonists, regional anesthesia techniques such as transverse abdominis plane [TAP] block, paravertebral block, or twelfth subcostal nerve block, as well as local anesthesia methods [5]. Utilizing opioids for pain relief can lead to severe adverse effects such as respiratory depression, drowsiness, queasiness, vomiting, constipation, and may also raise the likelihood of hospitalization [6]. A quadratus Lumborum block is a procedure where a local anesthetic is injected near the quadratus Lumborum muscle to achieve a broad area of numbness spanning from the T7 to L2 levels, aiming to affect the thoracolumbar nerves [7].

Successful application of Quadratus Lumborum Block [QLB] has been documented in providing pain relief after hip surgeries and abdominal procedures such as cesarean sections and sigmoid colectomies. Yet, the effectiveness of QLB in urological surgeries has shown varying results in terms of its impact on postoperative pain management and potential side effects [8]. So, the aim of this study is to compare between ultra sound guided anterior and posterior quadratus Lumborum block in ESWL.

PATIENTS AND METHODS

A prospective randomized controlled research study was carried out at Al-Azhar University Hospital [New Damietta] involving sixty male and female patients scheduled for ESWL. The study followed the guidelines set by the Al-Azhar Medical Research Ethical Committee and the principles of the Helsinki Declaration. Patients provided written consent for the use of their data and inclusion in the study. They also agreed to the publication of their information and images in an online open-access platform. Randomization was achieved using a computer-generated list and sealed envelopes, dividing the patients evenly into two groups: Group A [Anterior] where 30 patients received an ultrasound-guided Anterior Approach Quadratus Lumborum Block with a mixture of 20 mL of 0.25% bupivacaine [10 ml of 0.5% bupivacaine and 10 ml of 2% lidocaine], and Group B [Posterior] where the remaining 30 patients were administered an ultrasound-guided posterior Approach Quadratus Lumborum Block with the same anesthesia mixture.

The study included patients who met the following criteria: aged between 21 and 60 years, with an American Society of Anesthesiologists physical status [ASA] ranging from I to III, and possessing normal psychological health. On the other hand, patients were excluded from the study if they refused to participate, had contraindications to regional anesthesia such as local infections or bleeding disorders, were allergic to amide local anesthesia, had a BMI exceeding 30 kg/m², suffered from neurological or psychiatric ailments, had a recent history of narcotic or non-narcotic analgesic drug use within the 24-hour period before the operation, chronic pain issues, or struggled with drug and alcohol addiction.

Data collection: Each case underwent a thorough process that involved obtaining a detailed medical history [age, sex, conducting a clinical assessment, and performing standard preoperative laboratory tests.

Preoperative assessment: On the day of the operation, once the patient's fasting status was verified, they were transferred to the operating room. The patient was linked to monitoring devices, such as a 5-lead ECG, NIBP, SpO2, and HR, and the initial measurements were recorded. An 18G cannula was inserted for intravenous access and preloaded with 10 ml/kg of lactated Ringer's solution over 30 minutes.

Anesthetic Techniques

Group [A] Anterior approach Quadratus Lumborum Block

Patients were positioned in either the right or left lateral decubitus stance. The target area for the block was sterilized with a surgical antiseptic solution. A curved probe [2–5 MHz] was sanitized with a surgical antiseptic and covered with a sterile drape. The sterile probe was positioned transversely above the iliac crest and then moved cranially to visualize the external oblique muscle, internal oblique muscle, and transversus abdominis muscle clearly. The ultrasound [US] probe was oriented posteriorly. Once the quadratus Lumborum muscle was visible, the probe was stabilized. The quadratus Lumborum muscle, latissimus dorsi muscle, and vertebral transverse processes were identified. A 3.5 ml local anesthetic was administered into the skin and subcutaneous tissue. A 20-gauge, 100 mm block needle was inserted in the posterior-to-anterior plane, passing through the quadratus Lumborum muscle to visualize the psoas major muscle and erector spinae muscle. The needle was directed transmuscularly through the quadratus Lumborum muscle toward the space between the quadratus Lumborum and psoas major muscles. After confirming the injection site with 2 mL of 0.9% NaCl, 20 mL of 0.25% bupivacaine [10 mL of 0.5% bupivacaine and 10 mL of 2% lidocaine] was injected between the fascial layers of the two muscles. The spread of the local anesthetic was monitored, and sensory testing was conducted every 10 minutes using a hot-cold method. The block was considered successful if patients did not perceive cold sensation in the T10-L1 dermatomes after 20 minutes. The effectiveness of the block in specific dermatomes was documented.

Group [P] Posterior approach Quadratus Lumborum Block

All the first steps are similar to that of group A until the quadratus Lumborum muscle is clearly visualized. The quadratus Lumborum muscle, latissimus dorsi muscle, and vertebral transverse processes were viewed. A 20-gauge, 100-mm block needle was guided from a posterior-lateral to anterior-medial direction using the "in-plane" method. The quadratus Lumborum muscle, psoas major muscle, and erector spinae muscle were identified. Distribution of the local anesthetic was monitored, and a sensory assessment was conducted every 10 minutes using a hot-cold technique. The block was deemed successful for individuals who did not experience cold sensation in the T10-L1 dermatomes after 20 minutes; the specific dermatomes with successful block effects were documented.

Outcomes

Primary outcome: The postoperative pain score was assessed at 4 hours' intervals for 24 hours using the Visual analog scale [VAS]. For postoperative analgesia, If the VAS reaches four and/or the patient requests rescue analgesia, paracetamol 1 g was given IV every 6 hours. If pain persists after the administration of paracetamol, pethidine 0.5 mg/kg IV was given. Rescue analgesia use was documented after the surgery. The time taken to meet the discharge requirements from the hospital was assessed using the Post-Anesthesia Discharge Scoring System [PADS]. The average PADS score was assessed every 30 minutes up to 5 hours, and then at 6, 12, and 24 hours. If the PADS score exceeded 9, the patient was deemed ready for discharge, and the

time taken to meet the discharge criteria was recorded.

Secondary outcomes: Hemodynamic parameters including Mean Arterial Pressure [MAP], Heart Rate [HR], and Oxygen Saturation [SpO2] were recorded by an anesthetist who was unaware of the patient's group, 5 minutes prior to commencing the regional block, and then every 5 minutes following the block for 30 minutes, and subsequently every 15 minutes until the conclusion of the procedure.

The study compared various aspects such as block characteristics [time required for block administration, time until achieving surgical anesthesia, time until ambulation, and total rescue analgesic usage], changes in hemodynamics, adverse effects, as well as patient and surgeon satisfaction. A Likert 5-point scale was used to evaluate satisfaction levels of both the patients and surgeons involved. The time necessary to administer the block was measured from the administration of premedication [given just before the block] to the injection of the local anesthetic drug. For the block to be deemed 'successful', the onset of pinprick sensation needed to begin within 15 minutes [as the endpoint], or achieving a sensory block spanning from T10 to L2 within a maximum of 30 minutes. Otherwise, if these criteria were not met, it was classified as 'block failure', leading to the patient receiving general anesthesia and being excluded from the study. The time to begin the procedure was defined as the duration between the injection of the local anesthetic drug and the readiness for surgery, specifically when there was a sensory block at the T10 level.

Statistical Analysis: Data distribution normality was assessed with the Shapiro-Wilk test. Descriptive statistics such as means with standard deviations for numerical data and frequencies with percentages for categorical data were computed using SPSS Version 22.0 [IBM Corp, Armonk, NY]. To compare groups, the Chi-square test was applied for categorical variables, and the independent sample t-test was utilized for numerical variables. A p-value below 0.05 indicated statistical significance.

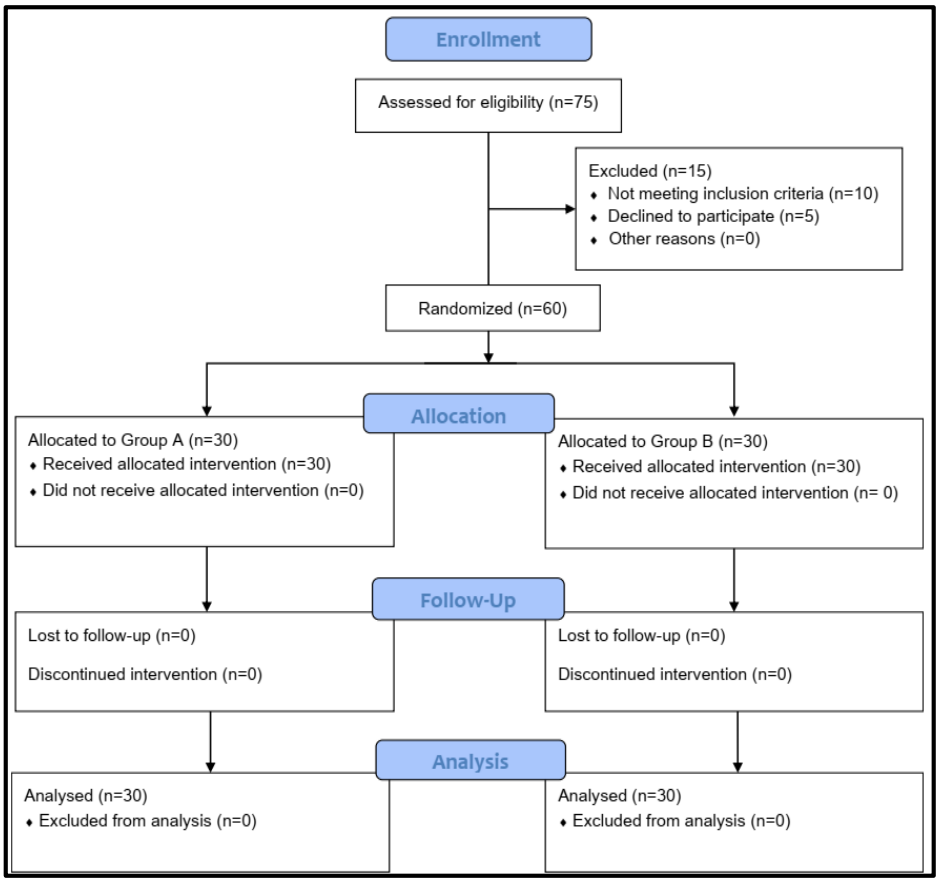

Figure [1]: CONSORT Flow Diagram

RESULTS

In our study, a total of 60 patients who underwent Extracorporeal Shock Wave Lithotripsy [ESWL] were included. The average age in group A was 44.9 ± 10.2 years, ranging from 25 to 60 years, while in group B, the mean age was 40.6 ± 11.2 years, with a range of 26 to 59 years. Group A comprised 14 males [46.7%] and 16 females [53.3%], whereas group B consisted of 11 males [36.7%] and 19 females [63.3%]. The average Body Mass Index [BMI] in group A was 25.7 ± 3.1 kg/m², varying between 19 and 30 kg/m². For group B, the mean BMI was 24.6 ± 3.9 kg/m², with a range of 18 to 30 kg/m². Based on the ASA physical state classification, group A had 30% of patients graded as ASA I, 30% as ASA II, and 40% as ASA III. In contrast, group B had 30% classified as ASA I, 33.3% as ASA II, and 36.7% as ASA III. No statistically significant variances were detected between the two groups concerning age, gender distribution, BMI, ASA physical state classification, procedure duration, and side of the procedure [P > 0.05 for all comparisons] **[Table 1].**

Regarding the Hemodynamic Parameters, we observed that there were no statistically significant variances between the two groups concerning the average arterial blood pressure [MAP], heart rate [HR], and oxygen saturation [SPO2] levels [P > 0.05 for all comparisons] **[Tables 2-4].**

Regarding the Visual Analog Scale [VAS], there was no statistically significant variance between the groups in terms of pain relief within the initial 12 hours following the surgery [P > 0.05]. However, group A exhibited a notably more significant pain relief compared to group B from 12 to 24 hours postoperatively [P < 0.001] **[Table5].**

According to Post anesthetic discharge score [PADS], a significantly higher PADS was observed in group A compared to group B from 2 to 24 hours

postoperatively [P < 0.001] **[Table 6].** The average time taken to perform the Quadratus Lumborum Block [QLB] was 9.7 ± 1.6 minutes in group A and 9.8±1.3 minutes in group B, showing no statistically significant difference between the two groups [P = 0.73]. In terms of the duration for achieving surgical anesthesia, the average time was notably shorter in group A compared to group B, with times of 18.5±2.1 minutes and 20.5 ± 1.9 minutes, respectively [P = 0.001]. The mean time until the first need for analgesia was significantly longer in group A than in group B, with times of 20.1±2.8 minutes and 12.5 ± 1.8 minutes, respectively [P = 0.000]. The average number of supplemental analgesic doses required was 0.53±0.9 in group A and 1.9±1.6 in group B. Similarly, the total opioid dosage administered was 13.3 ± 24.3 mg in group A and 46.5±42.2 mg in group B, indicating a substantial difference between the groups. Posterior QLB necessitated a significantly higher frequency and quantity of additional analgesia when compared to anterior QLB [P = 0.000]. Concerning the time taken to ambulate, the mean duration was 160.8±12.1 minutes in group A and 170.6 ± 11.4 minutes in group B. The time required to meet discharge criteria was notably shorter in group A than in group B, with times of 2.9 ± 0.3 hours and 4.3 ± 0.4 hours, respectively [P = 0.001 for both] **[Table 7].** In terms of postoperative complications, nausea was experienced by three patients [10%] in group A and five patients [16.7%] in group B. Vomiting occurred in one patient [3.3%] in group A and three patients [10%] in group B. Dizziness was noted in three patients [10%] in group A and six patients [20%] in group B. Sedation was observed in two patients [6.7%] in group A and four patients [13.3%] in group B. There were no reports of hemodynamic instability or respiratory depression. No statistically significant variation was found between the groups in terms of the occurrence of postoperative complications [P > 0.05] **[Table 8].**

According to Likert 5-scale for satisfaction, the mean score for patient satisfaction was 4.63±0.5 in group A and 3.7±0.7 in group B. The mean score for surgeon satisfaction was 4.7±0.5 in group A, and 3.9±0.7 in group B. Group A demonstrated significantly higher patient and surgeon satisfaction rate than group B [P = 0.000] **[Table 9].**

Table [1]: Baseline Demographic Data [n = 60]

	Variables	Group A [n=30]	Group B [n=30]	P value
Age [years]	Mean ± SD	44.9 ± 10.2	40.6 ± 11.2	0.125
	Range	25 – 60	25 – 59	
BMI [kg/m^2]	Mean ± SD	25.6 ± 3.2	24.5 ± 3.9	0.251
	Range	19 – 30	18 – 30	
Sex [n,%]	Male	14 [46.7%]	11 [36.7%]	0.432
	Female	16 [53.3%]	19 [63.3%]	
ASA [n,%]	Grade I	9 [30%]	9 [30%]	0.953
	Grade II	9 [30%]	10 [33.3%]	
	Grade III	12 [40%]	11 [36.7%]	
Side [n,%]	Right	14 [46.7%]	15 [50%]	0.796
	Left	16 [53.3%]	15 [50%]	
Duration of Surgery [min.]	Mean ± SD	43.5 ± 8.9	47.6 ± 8.9	0.079
	Range	30 – 60	33 – 60	

Table [2]: Changes in MAP [mmHg]

	Variables	Group A [n=30]		Group B [n=30]		P value*
		Mean	SD	Mean	SD	
Intraoperative MAP [mmHg].	Baseline	87.7	11.76	90.6	10.7	0.32
	5 min	82.3	8.3	84.5	8.8	0.3
	10 min	79.5	6.78	81.4	8.12	0.33
	15 min	77	5.94	78.4	7.84	0.438
	20 min	75.4	5.6	76.7	7.95	0.47
	25 min	74.1	5.68	75.2	7.89	0.53
	30 min	72.6	5.8	73.5	8.06	0.62
	45 min	69.7	4.56	71.7	8.96	0.28
	60 min	67	2.4	70.02	8.4	0.06
Postoperative MAP [mmHg].	10 min	65.7	8.87	65.8	10.09	0.96
	20 min	70.6	7.1	71.3	7.78	0.71
	30 min	73	6.6	74.1	6.9	0.53
	40 min	75.6	6.38	77	6.29	0.39
	50 min	80.4	6.8	82.2	6.4	0.29
	1 hr.	82.6	7.48	85	7.15	0.2
	4 hr.	82.6	7.48	85	7.15	0.2
	8 hr.	83.2	7.7	85.6	7.36	0.22
	12 hr.	83.9	7.9	86.4	7.5	0.21
	16 hr.	83.9	7.9	86.4	7.5	0.21
	20 hr.	84.4	8.1	87	7.8	0.2
	24 hr.	85	8.36	87.6	8.07	0.22

Table [3]: Changes in HR

	Variables	Group A [n=30]		Group B [n=30]		P value*
		Mean	SD	Mean	SD	
Intraoperative HR	Baseline	77.7	11.76	80.6	10.7	0.32
	5 min	72.3	8.27	74.5	8.75	0.32
	10 min	69.5	6.78	71.4	8.12	0.33
	15 min	67	5.9	68.4	7.8	0.43
	20 min	65.4	5.6	66.7	7.95	0.46
	25 min	64.1	5.68	65.2	7.89	0.53
	30 min	62.6	5.8	63.5	8.06	0.62
	45 min	59.7	4.56	61.7	8.96	0.28
	60 min	58	1.4	60	8.4	0.2
Postoperative HR	10 min	55.7	8.87	56	10.09	0.9
	20 min	60.6	7.13	61.3	7.78	0.71
	30 min	63	6.6	64.1	6.9	0.53
	40 min	65.6	6.38	67	6.29	0.39
	50 min	70.4	6.8	72.2	6.4	0.29
	1 hr.	72.6	7.48	75	7.15	0.2
	4 hr.	72.6	7.48	75	7.15	0.2
	8 hr.	73.2	7.7	75.6	7.36	0.22
	12 hr.	73.9	7.9	76.4	7.5	0.213
	16 hr.	73.9	7.9	76.4	7.5	0.213
	20 hr.	74.4	8.1	77	7.8	0.2
	24 hr.	75	8.3	77.6	8.07	0.22

Table [4]: Changes in the Spo2

	Variables	Group A [n=30]		Group B [n=30]		P value*
		Mean	SD	Mean	SD	
Intraoperative SPO2	**Baseline**	97.2	0.8	97.6	0.78	0.05
	5 min	97.3	0.9	97.5	0.88	0.38
	10 min	97.4	0.7	97.4	1.02	1.000
	15 min	97.4	0.86	97.6	0.9	0.38
	20 min	97.4	0.5	97.7	0.8	0.09
	25 min	97.5	0.9	97.8	0.9	0.2
	30 min	97.5	0.6	97.6	0.66	0.54
	45 min	97.6	0.8	97.6	0.92	1.000
	60 min	97.6	1.27	97.2	0.62	0.126
Postoperative SPO2	**10 min**	97.7	0.89	97.4	0.99	0.22
	20 min	97.7	0.88	97.6	0.75	0.63
	30 min	97.5	0.74	97.4	0.88	0.635
	40 min	97.4	0.85	97.6	0.89	0.38
	50 min	97.8	0.8	97.5	0.66	0.118
	1 hr.	97.7	0.86	97.4	0.89	0.189
	4 hr.	97.7	0.86	97.4	0.89	0.189
	8 hr.	97.7	0.7	97.4	0.7	0.1
	12 hr.	97.7	0.66	97.5	0.6	0.22
	16 hr.	97.6	0.66	97.5	0.6	0.22
	20 hr.	97.6	0.74	97.5	0.67	0.58
	24 hr.	97.6	0.9	97.6	0.8	1.000

Table [5]: VAS of the studied patients

Variables	Group A [n=30]		Group B [n=30]		*P* value*
	Mean	SD	Mean	SD	
Postoperative Pain Scale					
Baseline	0.5	0.77	0.5	0.68	0.725
4 hours	0.8	0.83	0.8	0.59	1.000
8 hours	0.9	0.86	0.9	0.69	1.000
12 hours	1.8	1.432	2.5	1.50	0.100
16 hours	2.3	1.022	3.5	1.00	0.000
20 hours	2.5	0.57	4.0	1.37	0.000
24 hours	2.7	0.83	3.8	1.46	0.001

Table [6]: PADS of the studied patients

Variables	Group A [n=30]		Group B [n=30]		*P* value*
	Mean	SD	Mean	SD	
PADS					
Baseline	6.3	0.83	5.9	0.92	0.149
0.5 hours	6.3	0.75	6.0	0.85	0.203
1 hour	6.9	0.82	6.4	0.67	0.081
1.5 hours	7.1	0.78	7.1	0.87	0.643
2 hours	8.0	-	8.0	-	-
2.5 hours	8.3	0.47	8.0	-	0.000
3 hours	8.8	0.40	8.0	-	0.000
3.5 hours	9.5	0.50	8.0	0.18	0.000
4 hours	10.0	-	8.5	0.50	0.000
4.5 hours	10.0	-	8.8	0.40	0.000
5 hours	10.0	-	9.4	0.49	0.000
6 hours	10.0	-	10.0	-	0.000
12 hours	10.0	-	10.0	-	0.000
24 hours	10.0	-	10.0	-	0.000

Table [7]: Block Characteristics [n = 60 patients]

Variables	Group A [n=30]		Group B [n=30]		P value*
	Mean	SD	Mean	SD	
Time to Perform the Block [min]	9.7	1.6	9.8	1.3	0.736
Time to Surgical Anaesthesia [min]	18.5	2.1	20.5	1.9	0.000
Time to First Analgesic Requirement [hr]	20.1	2.8	12.5	1.8	0.000
No. Rescue Analgesic Doses	0.53	0.9	1.9	1.6	0.000
Total Amount of Rescue Analgesia [mg]	13.3	24.3	47.5	42.2	0.000
Time to Ambulate [min]	160.8	12.1	170.6	11.4	0.002
Time to Reach Discharge Criteria [hr]	2.9	0.3	4.3	0.4	0.000

Table [8]: Postoperative complications of the studied patients

Variables	Group A [n=30]		Group B [n=30]		P value
	No.	%	No.	%	
Nausea	3	10	5	16.7	0.448
Vomiting	1	3.3	3	10	0.301
Dizziness	3	10	6	20	0.278
Sedation	2	6.7	4	13.3	0.389
Hemodynamic Instability	0	0	0	0	-
Respiratory Depression	0	0	0	0	-

Table [9]: Satisfaction of the studied patients

Variables		Group A [n=30]		Group B [n=30]		P value*
		No.	%	No.	%	
Patient Satisfaction	Extremely satisfied	19	63.3	13	43.3	0.21
	Very satisfied	11	36.7	13	43.3	
	Neutral	0	0	4	13.3	
	Mean ± SD	4.63 ± 0.5		3.7 ± 0.7		< 0.001
Surgeon Satisfaction	Extremely satisfied	22	73.3	8	26.7	0.001
	Very satisfied	8	27.7	15	50	
	Neutral	0	0	7	13.3	
	Mean ± SD	4.7 ± 0.5		3.9 ± 0.7		< 0.001

DISCUSSION

Effective pain management is crucial for the success of ESWL. The procedure begins with low energy levels and gradually escalates to fragment the stone. However, if the patient is unable to withstand the higher energy levels, the success rate of the procedure decreases [5]. The best method for managing pain involves a combination of approaches to reduce the need for opioids. Regional anesthesia techniques play a significant role in implementing this strategy [9].

In this study, we show how effective QLB is when used as part of a comprehensive pain relief approach. According to the postoperative pain, the mean VAS score in group A and B was 0.5 ± 0.7 at the baseline, 2.7 ± 0.83 in group A, and 3.8 ± 1.46 at 24 hours postoperative in group B. VAS score was increasing overtime in both groups similarly [P value > 0.05] until 12 hours postoperative after which [at 16, 20, and 24 hours] the VAS score was significantly higher in group B than in group A [P = 0.001]. By comparing our results to the results of **Peksoz *et al.*** [10], we found that, the degree of improvement in the pain in Peksoz et al. study was better than us, as the highest

value of VAS in their study was 2.7 ± 1.3 at 8 hours postoperative otherwise, all VAS values was lower than our values all over the follow-up periods. This difference may be due to the different surgical procedure for stone removal between the two studies as they included patients who underwent percutaneous nephrolithotomy and we included patients underwent ESWL. Also, the difference in the type of injected materials may be another factor for the disagreement between the two studies. **Yayik *et al.*** [5] assessed the pain at 20 minutes postoperative and in ESWL group they found that the median VAS has been increased from 0 at 5 minutes postoperative to 2 at 20 minutes postoperative.

According to PADS, no statistically significant difference was found between the two groups regarding discharge score during the first 2 hours postoperatively [P > 0.05]. On the other hand, a significantly higher PADS was observed in group A compared to group B from 2 to 24 hours postoperatively [P = 0.001] which is in agreement with the study of **Alansary *et al.*** **[11].**

In our study, the mean time to first analgesic requirement was 20.1 ± 2.8 minutes in group A, and 12.5 ± 1.8 minutes in group B. Anterior QLB demonstrated a significantly longer time to first analgesic requirement compared to the posterior QLB [P = 0.000]. The mean number of rescue analgesic doses was 0.53 ± 0.9 in group A, and 1.9 ± 1.6 in group B. Accordingly, the mean total amount of opiate administration was 13.3 ± 24.3 mg in group A and 46.5 ± 42.2 mg in group B. Posterior QLB demonstrated significantly larger frequency and amount of rescue analgesia compared to anterior QLB [P = 0.000]. These results come in line with the findings of **Yayik *et al.*** [5].

Group A demonstrated a significantly shorter time to start walking compared to Group B [160.8 ± 12.1 vs 170.6 ± 11.4, P = 0.001]. Additionally, Group A had a notably quicker time to meet discharge requirements [2.9 ± 0.3] than Group B [4.3 ± 0.4, P = 0.004]. Our research findings suggest that the surgical incision created a pathway for the local anesthetic injection to disperse some of its volume, thereby reducing its effectiveness post-surgery. In consistence with our results, **Peksoz *et al.*** [10]**,** found in Group QLB, Duration of anesthesia [minutes] was 134.75 ± 45.87. Also, they found that, in Group QLB, first analgesic time [minute] was 220.50 ± 44.42 which is longer time than ours.

In our research, we examined the occurrence of postoperative complications in the groups under study. Nausea was experienced by three patients [10%] in group A and five patients [16.7%] in group B. Vomiting was noted in one patient [3.3%] in group A and three patients [10%] in group B. Dizziness was reported by three patients [10%] in group A and six patients [20%] in group B. Sedation was observed in two patients [6.7%] in group A and four patients [13.3%] in group B. There were no instances of hemodynamic instability or respiratory depression reported. No statistically significant variance was found between the groups in terms of postoperative complication rates [P > 0.05]. In support of our findings, **Alansary *et al.*** **[11]** noted side effects including sedation, nausea, vomiting, bradycardia, hypotension, and respiratory depression. Similarly, **Peksoz *et al.*** [10] reported side effects such as nausea, vomiting, itching, constipation, and urinary retention in their study.

The success of ESWL was impacted by the precise focusing of shock waves, facilitated by fluoroscopy or USG guidance. Patient movements caused by pain during ESWL can disrupt shock wave focus and decrease procedural success. Thus, ensuring effective and suitable pain relief is crucial for procedure success. Additionally, the success rate is influenced by the intensity and duration of the energy applied **[12]**. In cases where adequate pain relief is lacking, patients may struggle to tolerate the necessary energy levels and treatment durations for stone fragmentation **[5]**.

Our study has certain limitations, such as a limited sample size and conducting postoperative analgesia assessment only within the initial 24 hours after surgery. It is noteworthy that the analgesic effects of quadratus lumborum block can extend for up to 48 hours' post-surgery. Furthermore, the fixed time intervals for assessing VAS scores may have hindered the precise determination of patients' analgesic needs.

Conclusion: Ultrasound Guided Anterior Approaches of Quadratus Lumborum Block in Extracorporeal Shock Wave Lithotripsy was better than posterior approaches in terms of maintained pain relief, higher PADS, and higher patient and surgeon satisfaction.

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