RESEARCH PAPER

Comparative Study of Femoral Nerve Block and Fascia Iliaca Compartment Block Using Ultrasound for Positioning and Post-operative Analgesia in Proximal Femur Fractures.

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ABSTRACT

Background: Proximal femur fractures are associated with severe pain, making patient positioning for spinal anaesthesia challenging. Peripheral nerve blocks such as femoral nerve block (FNB) and fascia iliaca compartment block (FICB) provide effective analgesia while minimizing opioid-related adverse effects.

Objective: To compare the efficacy of ultrasound-guided femoral nerve block and fascia iliaca compartment block in facilitating patient positioning for spinal anaesthesia and postoperative analgesia in patients undergoing surgery for proximal femur fractures.

Methods: This prospective randomized double-blind study included 62 patients aged 20–60 years undergoing elective surgery for proximal femur fractures. Patients were randomly divided into two groups: Group FNB (n=31) received ultrasound-guided femoral nerve block and Group FICB (n=31) received ultrasound-guided fascia iliaca compartment block. Both groups received 30 ml of 0.25% bupivacaine with dexmedetomidine 1 µg/kg. Pain was assessed using the Visual Analogue Scale (VAS) during positioning for spinal anaesthesia and in the postoperative period. Hemodynamic parameters and time to first rescue analgesia were recorded.

Results: Demographic characteristics were comparable between groups. The FNB group demonstrated significantly lower VAS scores at 10, 15 and 20 minutes after block administration ($p<0.001$), indicating faster onset of analgesia. However, postoperative analgesia lasted longer in the FICB group. Hemodynamic parameters remained stable in both groups.

Conclusion: Ultrasound-guided femoral nerve block provides faster analgesia for positioning during spinal anaesthesia, whereas fascia iliaca compartment block offers longer postoperative analgesia.

Keywords:N\A.

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INTRODUCTION

Proximal femur fractures are common orthopaedic injuries requiring surgical management and hospitalization. These fractures are often associated with severe pain that makes patient positioning for spinal anaesthesia difficult.[1] Pain management in these patients is crucial because inadequate analgesia can lead to sympathetic stimulation resulting in tachycardia, hypertension and increased perioperative morbidity.[2] Traditionally, systemic opioids have been used for analgesia; however, they are associated with adverse effects such as respiratory depression, nausea, vomiting, constipation and delirium.[3] Peripheral nerve blocks have emerged as effective alternatives for perioperative analgesia in patients with hip fractures. These techniques reduce opioid requirements, provide superior pain control and facilitate patient positioning for neuraxial anaesthesia.[4] Femoral nerve block (FNB) and fascia iliaca compartment block (FICB) are commonly used regional anaesthesia techniques for providing analgesia in proximal femur fractures. Ultrasound guidance has improved the safety and success rate of these blocks by allowing visualization of anatomical structures and real-time monitoring of local anaesthetic spread.[5] Although both techniques are effective, only limited studies have compared ultrasound-guided FNB and FICB in terms of analgesic efficacy for positioning during spinal anaesthesia and postoperative pain management.[6] Therefore, the present study was conducted to compare ultrasound-guided femoral nerve block and fascia iliaca compartment block in patients undergoing surgery for proximal femur fractures.

MATERIALS AND METHODS

This prospective randomized double-blind study was conducted in the Department of Anaesthesiology at Maharishi Markandeshwar Institute of Medical Sciences and Research, Mullana after obtaining institutional ethical committee approval. A total of 62 patients aged 20–60 years with ASA physical status I–II undergoing elective surgery for proximal femur fracture were included.

Inclusion Criteria

- Age 20–60 years
- ASA I–II
- Elective proximal femur fracture surgery

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Exclusion Criteria

- Allergy to local anaesthetic drugs
- Infection at injection site
- BMI >30 kg/m²
- Patients on anticoagulant therapy
- Contraindications to spinal anaesthesia

Patients were randomly divided into two groups:

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Group FNB (n=31):

Ultrasound-guided femoral nerve block with 30 ml 0.25% bupivacaine + dexmedetomidine 1 µg/kg

Group FICB (n=31):

Ultrasound-guided fascia iliaca compartment block with 30 ml 0.25% bupivacaine + dexmedetomidine 1 µg/kg

Pain was assessed using the Visual Analogue Scale (VAS) at baseline, 3, 5, 10, 15 and 20 minutes after the block. Spinal anaesthesia was administered once VAS score was less than 3.Postoperative pain was assessed at regular intervals up to 18 hours.

STATISTICAL ANALYSIS

Statistical analysis was performed using SPSS version 21. Continuous variables were expressed as mean ± standard deviation. Student's t-test and Mann-Whitney U test were used for comparison between groups. A p-value <0.05 was considered statistically significant.

RESULTS

Table 1: Demographic Characteristics

Variable	FNB (n=31)	FICB (n=31)	p-value
Age (years)	46.26 ± 11.49	46.06 ± 6.90	0.563
Weight (kg)	73.03 ± 6.82	74.06 ± 7.38	0.570
Height (cm)	172.03 ± 8.70	173.03 ± 8.50	0.649
BMI	24.75 ± 2.39	24.77 ± 2.13	0.971

No statistically significant difference was observed between the two groups.

Table 2: Intraoperative VAS Scores

Time	FNB	FICB	p-value
Baseline	8.42 ± 0.96	8.45 ± 1.15	0.982
3 min	6.94 ± 0.89	6.81 ± 0.70	0.586
5 min	2.84 ± 0.52	3.00 ± 0.93	0.577
10 min	2.68 ± 0.65	4.23 ± 1.43	0.001
15 min	0.74 ± 0.93	3.52 ± 1.21	0.001
20 min	0.16 ± 0.45	2.42 ± 1.06	0.001

Pain reduction occurred significantly faster in the FNB group**.**

DISCUSSION

Effective analgesia is essential for patients with proximal femur fractures to facilitate positioning for spinal anaesthesia and improve postoperative recovery. The present study demonstrated that ultrasound-guided femoral nerve block produced faster onset of analgesia compared with fascia iliaca compartment block. Similar findings were reported by Jain et al.[6] and Liang et al.[7] who observed superior analgesia during positioning with femoral nerve block. However, the duration of postoperative analgesia

was longer in the FICB group, which is consistent with findings reported by Gupta et al.[8] and Regmi et al.[9]

Both blocks maintained stable hemodynamic parameters and were not associated with significant complications, indicating their safety and effectiveness when performed under ultrasound guidance.

CONCLUSION

Ultrasound-guided femoral nerve block provides faster onset of analgesia, facilitating easier positioning for spinal anaesthesia. Fascia iliaca compartment block provides longer postoperative analgesia, reducing the need for rescue analgesics. Both techniques are safe and effective for perioperative pain management in proximal femur fracture surgery.

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