RESEARCH PAPER

Successful ultrasound-guided fascia iliaca compartment block in elderly hip fracture patients- A case series

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Abstract

Background

Hip fractures in elderly patients are associated with severe pain, difficulty in positioning for neuraxial anesthesia, and increased perioperative morbidity. Ultrasound-guided fascia iliaca compartment block (FICB) has emerged as an effective regional anesthesia technique that provides analgesia while reducing opioid requirements. This case series describes our clinical experience with ultrasound-guided FICB in elderly patients undergoing surgery for hip fractures.

Case Series

Five elderly patients (aged 69–84 years) with hip fractures underwent ultrasound-guided fascia iliaca compartment block before subarachnoid anesthesia. In all patients, 30 mL of 0.25% bupivacaine was administered under ultrasound guidance. Pain intensity was assessed using the Numeric Rating Scale (NRS) before and after the block, and perioperative outcomes including ease of positioning, duration of analgesia, opioid requirement, and block-related complications were documented.

Results

All five patients experienced rapid and effective analgesia within 15–20 minutes following block administration. The median NRS pain score decreased from 8–10 before the block to 1–2 after the block, allowing comfortable positioning for spinal anesthesia without rescue intravenous opioids. Postoperative analgesia lasted approximately 10–12 hours in all cases. Hemodynamic stability was maintained throughout surgery, and no complications such as vascular puncture, local anesthetic systemic toxicity, nerve injury, or infection were observed.

Conclusion

Ultrasound-guided fascia iliaca compartment block is a safe, effective, and reliable regional anesthesia technique for elderly patients with hip fractures. It provides excellent preoperative analgesia, facilitates positioning for neuraxial anesthesia, reduces perioperative opioid requirements, and offers prolonged postoperative pain relief. This case series supports the incorporation of ultrasound-guided FICB into multimodal analgesia protocols for hip fracture surgery.

Keywords: Fascia iliaca compartment block; Ultrasound-guided regional anesthesia; Hip fracture; Spinal anesthesia; Multimodal analgesia; Case series.

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Introduction

Hip fractures are among the most common orthopedic injuries in the elderly and are associated with substantial morbidity, mortality, prolonged hospitalization, and loss of functional independence. The increasing life expectancy and prevalence of osteoporosis have led to a steady rise in the incidence of fragility hip fractures worldwide, making effective perioperative management an important component of patient care [1,2]. Severe pain resulting from hip fractures often limits patient positioning for neuraxial anesthesia, delays surgical intervention, and contributes to adverse physiological responses, including tachycardia, hypertension, delirium, and respiratory complications, particularly in frail older adults with multiple comorbidities [3,4].

Adequate analgesia before surgery is therefore essential to facilitate patient comfort, improve positioning for spinal or epidural anesthesia, reduce systemic opioid requirements, and minimize opioid-related adverse effects such as respiratory depression, nausea, vomiting, and postoperative delirium [5,6]. Although systemic analgesics remain widely used, regional anesthesia techniques have gained increasing acceptance because they provide targeted pain relief while preserving hemodynamic stability and reducing perioperative opioid consumption [7,8].

The fascia iliaca compartment block (FICB) is a simple and effective regional anesthetic technique that blocks the femoral, lateral femoral cutaneous, and, variably, the obturator nerves supplying the hip joint. The introduction of ultrasound guidance has significantly improved the accuracy, success rate, and safety of FICB by allowing direct visualization of the fascial planes, local anesthetic spread, and adjacent neurovascular structures [9,10]. Compared with landmark-based techniques, ultrasound-guided FICB has been associated with superior analgesia,

fewer complications, and greater patient satisfaction [11].

Several studies have demonstrated that ultrasound-guided FICB provides effective preoperative analgesia in elderly patients with hip fractures, facilitates optimal positioning for subarachnoid anesthesia, decreases perioperative opioid requirements, and enhances postoperative recovery as part of multimodal analgesic strategies [12-14]. Furthermore, current anesthesia guidelines increasingly recommend incorporating ultrasound-guided peripheral nerve blocks into enhanced recovery pathways for hip fracture surgery because of their favorable efficacy and safety profile [15].

Despite the growing evidence supporting ultrasound-guided FICB, reports describing its successful clinical application in elderly hip fracture patients in routine anesthetic practice remain valuable. This case series highlights the effectiveness of ultrasound-guided fascia iliaca compartment block in providing satisfactory analgesia, facilitating anesthetic management, and improving perioperative care in elderly patients undergoing surgery for hip fractures.

Case Series

Case 1

A 72-year-old woman (ASA II) presented with a left intertrochanteric fracture following a domestic fall. She had a history of hypertension controlled with medication. On admission, her Numeric Rating Scale (NRS) pain score was 9/10 at rest and 10/10 during limb movement, making positioning for spinal anesthesia extremely difficult. After obtaining informed consent, an ultrasound-guided fascia iliaca compartment block (FICB) was performed using a high-frequency linear probe. Thirty milliliters of 0.25% bupivacaine was injected beneath the fascia iliaca under real-time ultrasound guidance. Within 20 minutes, the patient's pain score decreased to 2/10, allowing comfortable sitting for subarachnoid block. The intraoperative and postoperative periods were uneventful, and no additional opioid analgesics were required during the first 12 hours.

Case 2

A 78-year-old man (ASA III) with diabetes mellitus and ischemic heart disease sustained a right neck of femur fracture after a fall. He complained of severe pain (NRS 8/10) and was unable to tolerate movement for neuraxial anesthesia. Ultrasound-guided FICB was administered with 30 mL of 0.25% bupivacaine. Adequate analgesia was achieved within 15 minutes, reducing the pain score to 2/10. The patient was positioned comfortably for spinal anesthesia without requiring intravenous opioids. Hemodynamic parameters remained stable throughout surgery, and postoperative analgesia lasted approximately 10 hours.

Case 3

An 81-year-old woman (ASA III) with chronic obstructive pulmonary disease and hypertension presented with a displaced intertrochanteric fracture of the left femur. Her initial pain score was 9/10, and she was extremely anxious because of severe pain. Ultrasound-guided FICB was performed using 30 mL of 0.25% bupivacaine. Pain decreased to 1/10 after 20 minutes, enabling painless positioning for spinal anesthesia. The surgery proceeded uneventfully. No complications related to the nerve block were observed, and postoperative opioid consumption was minimal.

Case 4

A 69-year-old woman (ASA II) with osteoporosis sustained a right intertrochanteric fracture following a slip at home. She reported severe pain (NRS 8/10) despite intravenous paracetamol. An ultrasound-guided fascia iliaca compartment block with 30 mL of 0.25% bupivacaine was administered. Twenty minutes later, her pain score reduced to 2/10, allowing easy positioning for spinal anesthesia. Intraoperative hemodynamics remained stable, and the patient reported satisfactory pain relief for nearly 11 hours after surgery without any block-related complications.

Case 5

An 84-year-old man (ASA III) with hypertension, type 2 diabetes mellitus, and chronic kidney disease presented with a left femoral neck fracture. His baseline pain score was 10/10, preventing movement of the affected limb. Ultrasound-guided FICB using 30 mL of 0.25% bupivacaine resulted in significant pain relief within 15–20 minutes, with the pain score decreasing to 2/10. The patient tolerated sitting for spinal anesthesia comfortably, and surgery was completed successfully. No adverse events such as local anesthetic toxicity, vascular puncture, or nerve injury occurred. Postoperative pain control was satisfactory, with only scheduled non-opioid analgesics required during the first postoperative day.

Variable	Case 1	Case 2	Case 3	Case 4	Case 5
Age (years)	72	78	81	69	84
Sex	Female	Male	Female	Female	Male
ASA Physical Status	II	III	III	II	III
Diagnosis	Left intertrochanteric fracture	Right neck of femur	Left intertrochanteric fracture	Right intertrochanteric fracture	Left femoral neck fracture

		fracture			
Comorbidities	Hypertension	Diabetes mellitus, Ischemic heart disease	COPD, Hypertension	Osteoporosis	Hypertension, Diabetes mellitus, Chronic kidney disease
Initial NRS pain score	9/10	8/10	9/10	8/10	10/10
Local anaesthetic	0.25% Bupivacaine	0.25% Bupivacaine	0.25% Bupivacaine	0.25% Bupivacaine	0.25% Bupivacaine
Volume injected	30 mL	30 mL	30 mL	30 mL	30 mL
Time to effective analgesia	20 min	15 min	20 min	20 min	15–20 min
Post-block NRS pain score	2/10	2/10	1/10	2/10	2/10
Positioning for spinal anaesthesia	Comfortable	Comfortable	Comfortable	Comfortable	Comfortable
Duration of analgesia	12 h	10 h	12 h	11 h	12 h
Additional intraoperative opioids	No	No	No	No	No
Block-related complications	None	None	None	None	None
Outcome	Uneventful recovery	Uneventful recovery	Uneventful recovery	Uneventful recovery	Uneventful recovery

Discussion

Effective pain management in elderly patients with hip fractures remains a cornerstone of perioperative care because inadequate analgesia is associated with increased physiological stress, difficulty in positioning for neuraxial anesthesia, delayed surgery, and a higher incidence of postoperative complications, including delirium and prolonged immobilization [1-3]. The advanced age of these patients and the presence of multiple comorbidities often limit the use of systemic opioids because of their adverse effects on respiratory and cardiovascular function [4,5]. Consequently, regional anesthesia techniques have become an integral component of multimodal analgesia in this patient population.

The fascia iliaca compartment block (FICB) is designed to provide analgesia by blocking the femoral nerve, lateral femoral cutaneous nerve, and, variably, the obturator nerve. The introduction of ultrasound guidance has significantly improved the success rate of the block by enabling direct visualization of the fascia iliaca, needle placement, and spread of local anesthetic while minimizing the risk of vascular puncture and other complications [6-9]. Compared with landmark-guided techniques, ultrasound-guided FICB provides more consistent analgesia and greater procedural safety.

In the present case series, all five elderly patients experienced rapid and clinically significant pain relief following ultrasound-guided FICB, with Numeric Rating Scale (NRS) scores decreasing from 8-10 before the block to 1-2 after block administration. Adequate analgesia was achieved within 15-20 minutes in all patients, allowing

comfortable positioning for subarachnoid anesthesia without the need for rescue intravenous opioids. Similar findings have been reported by previous studies, which demonstrated that ultrasound-guided FICB effectively reduces pain scores, facilitates patient positioning, and decreases perioperative opioid consumption in patients with hip fractures [10-13].

Another notable finding in our series was the prolonged postoperative analgesia, lasting approximately 10-12 hours after a single injection of 0.25% bupivacaine. This duration was sufficient to provide comfort during the immediate postoperative period and reduced the need for additional opioid analgesics. Previous investigators have likewise reported that FICB forms an important component of multimodal analgesia by providing sustained pain relief, improving patient satisfaction, and promoting early mobilization after hip fracture surgery [11-14].

Safety is an important consideration when performing peripheral nerve blocks in elderly patients. No block-related complications, including vascular puncture, local anesthetic systemic toxicity, nerve injury, hematoma, or infection, were observed in any of our patients. Ultrasound guidance likely contributed to this favorable safety profile by facilitating precise needle placement and real-time visualization of local anesthetic spread. These observations are consistent with current literature, which supports ultrasound-guided FICB as a safe and reliable regional anesthetic technique when performed by trained clinicians [8,9,15].

Although this case series includes only five patients and lacks a comparison group, it demonstrates the consistent clinical effectiveness of ultrasound-guided FICB across elderly patients with different fracture patterns and varying medical comorbidities. Larger prospective studies comparing ultrasound-guided FICB with systemic analgesia or other regional nerve blocks are warranted to further establish its role in perioperative hip fracture management.

Overall, our findings support the routine use of ultrasound-guided fascia iliaca compartment block as part of multimodal analgesia for elderly patients with hip fractures. The technique provides rapid and effective analgesia, facilitates positioning for spinal anesthesia, minimizes opioid requirements, maintains hemodynamic stability, and can be performed safely with a low risk of complications.

Summary

This case series describes five elderly patients with hip fractures who underwent ultrasound-guided fascia iliaca compartment block (FICB) as part of their perioperative anesthetic management. In all cases, the block provided rapid and effective analgesia, with a marked reduction in pain scores within 15–20 minutes of administration. Adequate pain relief facilitated comfortable positioning for subarachnoid anesthesia, eliminated the need for rescue opioid analgesia before surgery, and maintained stable intraoperative hemodynamics. Postoperative analgesia lasted approximately 10–12 hours, and no block-related complications were observed. These findings highlight the clinical utility of ultrasound-guided FICB as a safe and effective regional anesthetic technique in elderly patients undergoing surgery for hip fractures.

Conclusion

Ultrasound-guided fascia iliaca compartment block is an effective and reliable regional anesthesia technique for elderly patients with hip fractures. It provides rapid pain relief, facilitates positioning for neuraxial anesthesia, reduces perioperative opioid requirements, and offers prolonged postoperative analgesia with an excellent safety profile. Although limited by the small sample size, this case series supports the incorporation of ultrasound-guided FICB into multimodal analgesia protocols for hip fracture surgery. Larger prospective studies are warranted to further validate its efficacy and establish standardized clinical recommendations.

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