



Original contribution

# Fascia iliaca block vs intravenous fentanyl as an analgesic technique before positioning for spinal anesthesia in patients undergoing surgery for femur fractures—a randomized trial ☆, ☆ ☆, ★



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## Abstract

**Study objective:** Pain arising from femur fractures is of severe nature. Surgery for fixation of femoral fractures may be done under spinal anesthesia. We conducted this study to compare the analgesic efficacy of fascia iliaca compartment block (FICB) and intravenous fentanyl (IVF) before positioning for spinal anesthesia.

**Design:** Randomized controlled trial.

**Setting:** Operating room.

**Patients and interventions:** Sixty patients aged 25 to 75 years, with American Society of Anesthesiologists status I to III, undergoing surgery for femur fracture were chosen for the study and randomized into 2 groups. Patients in group FICB received the block with 30 mL of 0.375% ropivacaine 15 minutes before the subarachnoid block. Patients in group IVF received intravenous fentanyl at 0.5 µg/kg body weight repeated up to a maximum of 3 doses. Spinal was administered using 12 to 15 mg of 0.5% hyperbaric bupivacaine with glucose 80 mg/mL in patients of both groups.

**Measurements:** Preprocedural and postprocedural parameters such as visual analog scale (VAS) scores, sitting angle, quality of positioning, and time to perform the spinal were recorded. Patients were also assessed in the first 24 hours for analgesic requests.

**Main results:** Preprocedural VAS scores were similar in both groups. The “VAS after” was  $24.72 \pm 15.70$  mm in group FICB vs  $61.22 \pm 18.18$  mm in group IVF ( $P = .01$ ). The drop in VAS scores was significantly more in the FICB group. Sitting angle improved significantly in the FICB group. ( $56.17^\circ \pm 16.54^\circ$  vs  $21.38^\circ \pm 23.90^\circ$ ;  $P = .01$ ). Patients in group FICB also needed less time for spinal and had better quality of positioning. Postoperative analgesic requirement was lesser in group FICB.

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**Conclusion:** Fascia iliaca block offers superior analgesia compared to IVF in patients with femur fracture before positioning for spinal anesthesia.

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## 1. Introduction

Fracture of the femur occurs most commonly after trauma or trivial fall especially in the elderly. This causes significant morbidity. Surgery for fracture femur may be done under regional or general anesthesia. It has been shown that regional anesthesia is associated with lesser morbidity and mortality compared to general anesthesia [1-4]. A study comparing effectiveness of regional vs general anesthesia for hip surgery reviewed 18,158 patients among whom 5254 (29%) patients received regional anesthesia. Regional anesthesia was associated with a lower adjusted odds of mortality compared to general anesthesia [3]. Thus, femur fracture surgeries are performed safely under regional anesthesia.

Subarachnoid block is administered in either the sitting or lateral position. Positioning patients for spinal anesthesia with fractured femur is challenging because even minimal overriding of the fracture ends is exceedingly painful [5]. Providing analgesia before positioning not only increases patient comfort but also improves positioning and successful spinal block.

Nociception arises from the periosteum, which is very painful [6]. Pain causes spasm of the thigh muscles, which further displaces the fracture ends and worsens the pain cycle.

Blocks of the femoral nerve such as the classical femoral nerve block [6-8], 3-in-1 block [9,10], or fascia iliaca block [11-13] can serve to provide analgesia and as a method to facilitate positioning before spinal anesthesia. Fascia iliaca block is a safe and easy method to position patients before administering spinal anesthesia even in poor-risk patients such as those with renal and respiratory compromise where opioids are to be avoided [14].

Analgesia before positioning is also provided by conventional methods such as intravenous nonsteroidal anti-inflammatory drugs and opioids [5-7,11]. In this study, comparative analgesic efficacy of fascia iliaca block vs intravenous fentanyl was assessed with respect to positioning patients before spinal anesthesia.

## 2. Materials and methods

After obtaining ethical committee clearance (ethics committee of the MS Ramaiah Medical College and Hospitals, protocol no. STD-1/EC/0451/2011 approved on October 31, 2011) and informed consent from patients, 60 patients undergoing surgery for fracture femur were chosen for the study. Patients included were adults aged between 25 and 75 years, with American Society of Anesthesiologists (ASA)

status I to III and all types of femoral neck fractures. All patients were operated on by 1 of 4 surgeons at the center, all of whom had a minimal experience of 7 years in operating femur fractures. Patients with bleeding diathesis and neuropsychiatric complaints and who were on previous opioid therapy were excluded from the study. Patients with polytrauma were also excluded from the study.

Patients were randomized using computer-generated random number table into 2 groups of 30 patients. Patients in fascia iliaca compartment block (FICB) group received fascia iliaca compartment block with 30 mL of 0.375% ropivacaine 15 minutes before the subarachnoid block. Patients in intravenous fentanyl (IVF) group received intravenous fentanyl at 0.5 µg/kg body weight repeated up to a maximum of 3 doses with a minimum interval of 5 minutes between doses. Repeat bolus dose was given if visual analog scale (VAS) score was >50 mm when asked to sit. Repeat boluses were not given if any side effects such as nausea, vomiting, or giddiness were observed. Pain was assessed by using VAS score from 0 to 100 mm. Spinal was administered using 12 to 15 mg of 0.5% bupivacaine heavy.

Primary outcome of the study was to compare the analgesic efficacy offered by both the techniques in terms of reduction of pain and better positioning achieved. Secondary outcomes included assessment of postoperative analgesic requirements and untoward side effects, if any.

Fascia iliaca block was given using an 18G Tuohy needle. A line joining anterior superior iliac spine and the pubic tubercle was drawn. This line was divided into thirds. The point of insertion was 1 cm below the junction of medial two-thirds and lateral one-third. After local infiltration, the needle was used to feel for the 2 “pops” as it passed through the fascia lata and fascia iliaca, respectively. The local anesthetic was deposited in this space after negative aspiration. A total of 3 anesthesiologists who had minimum of 2 years of experience in performing neuraxial blocks and a minimum of 5 FICBs before attended to all the cases. The same anesthesiologist performed the FICB and the spinal.

The analgesia provided by either of the modes was subjectively assessed by using VAS scores before the block/IVF and after the block/IVF at 5-minute intervals. The patient was made to attempt sitting as comfortable as possible before administration of the analgesic technique to record the “before” and 15 minutes later to record the “after” variables. The patient was instructed to sit erect without any assistance, and in the consequence where they could not, they were asked to attempt as much sitting as possible independently. At the angle best achieved independently by a patient who was not able to sit erect, the sitting angle (SA) was measured objectively

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