



Effectiveness of Fascia Iliaca Compartment Block (FICB) for post-operative analgesia after proximal femur fracture surgeries

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ABSTRACT

Background and aims- Femoral nerve block, 3-in-1 block and FICB are commonly employed after hip and femur fracture surgeries for pain relief. Primary objective of the study is to study the duration of analgesia after FICB. Secondary objectives are to assess patients' satisfaction and safety of the block.

Material and method- Sixty patients of ASA status I or II undergoing proximal femur fracture surgeries under spinal anaesthesia were divided into 2 groups. Group A (n=30) receiving FICB with 30 ml Normal Saline and Group B (n=30) receiving FICB with 30 ml of 0.2% Bupivacaine. Each patient was assessed postoperatively in the PACU at 0, 2, 4, 6, 8, 12 and 24 hr for pain and the need for rescue analgesic was evaluated.

Results – The mean duration of analgesia in Group A was 5.66 ± 1.49 hours while in Group B it was 11.33 ± 3.45 hours which was significantly greater than Group A (P value < 0.0001).

The mean of VAS score after 2, 4, 6, 10, 12 hours of surgery was more in group A when compared to group B and the difference was statistically significant ($P < 0.05$).

Conclusion – FICB is easy to perform, reliable and provides longer post-operative analgesia period and reduces the opioid consumption.

Keywords: Fascia Iliaca Compartment Block (FICB), Bupivacaine

INTRODUCTION

Orthopaedic surgery is considered one of the most painful method and provides peri-operative analgesia in patients procedures during the postoperative period [1]. Early with painful conditions of thigh, hip joint and/or the surgery within 48 hours of fracture has shown to decrease femur. With ultrasound the femoral nerve and fascia iliaca complications and mortality rates [2]. Postoperative pain are visualized and local anaesthetic is deposited beneath intensity after hip fracture is high during ambulation and the fascia, lateral to the femoral nerve [8]. There has been may worsen the outcome [3][4][5]. The fascia iliaca higher incidence of successful blocks with faster onset compartment block (FICB) was initially described by and denser nerve blockade. There have been studies in the Dalens et al. in 1989, as a single injection procedure for past where FICB has been incorporated to manage the blocking the femoral, lateral cutaneous and obturator pain of the hip and femur fracture patients on arrival at the nerves, on children using landmark technique. Fascia emergency departments. There are also various studies Iliaca is dense fascia covering the Iliacus and Iliopsoas where the block has been performed pre-operatively to aid muscle [6]. Femoral nerve originates from the L₂ to positioning for spinal anaesthesia and post operative pain L₄ nerve roots and travels under the iliacus fascia along relief. But there is scarce data and literature where this with the lateral femoral cutaneous nerve and the obturator block has been performed post operatively. Therefore nerve [7]. It is a low-skill, inexpensive, easy to perform

designed this study to assess the usefulness, quality and increase and moving it slowly in either directions. duration of analgesia when performed post operatively.

MATERIAL AND METHOD

This study design was prospective, randomised and controlled. After getting approval from Institutional Ethics Committee, it was conducted on 60 patients posted for proximal femur fracture surgeries under Subarachnoid block from April 2019 to March 2020.

A detailed history of all selected patients was taken. A thorough pre-anaesthetic evaluation including the airway assessment was performed. The patients were explained about the entire procedure to be done and informed consent was taken from them. They were also educated about the VAS score. Thereafter, they were shifted to the operation theatre. Monitors were attached and baseline parameters namely heart rate, systolic and diastolic blood pressure, mean arterial pressure, SpO₂, ECG tracings were recorded and continuously monitored. Intravenous line was secured. Full resuscitation equipments were kept ready. All the patients were given Subarachnoid Block with Bupivacaine (0.5%) heavy (Bupivacaine Hydrochloride in Dextrose injection USP) injection into the subarachnoid space at L3-L4 spinal level via 25 gauge Quincke's spinal needle. The patients were randomised using a computer-based randomisation software, "Random Allocation Software 1.0" [Copyright © 2017 Informer Technologies, INC] in two groups of 30 patients each:

Group A (n = 30) was the control group and received 30 ml of Normal Saline and standard postoperative analgesic regimen with intravenous Paracetamol and Diclofenac injection. Group B (n = 30) received Fascia Iliaca Compartment Block (FICB) with 30 ml of 0.2% Bupivacaine, at the end of surgery, in addition to standard postoperative analgesic regimen. On patients of both the groups, FICB was performed at the end of the surgery, with the patient in the supine position and with the table flattened to maximize access to the inguinal area. Using ultrasound, femoral artery was quickly visualised by placing the transducer transversely on the inguinal

Tilting the probe while pressing helped to identify the hyperechoic fascia iliaca superficial to the hypoechoic iliopsoas muscle. The femoral nerve was visualized deep to the fascia and lateral to the artery. The goal was to pierce the fascia iliaca and place the needle tip approximately at the junction of medial two-third and lateral one-third of the line joining the Anterior Superior Iliac Spine to the pubic tubercle and to deposit a local anaesthetic until it spreads laterally toward the iliac spine and medially toward the femoral nerve and was observed with ultrasound visualization. With the patient in the proper position, the skin was disinfected and the transducer positioned to identify the femoral artery and the iliopsoas muscle and fascia iliaca. The transducer was moved laterally until the sartorius muscle was identified. The needle was inserted in-plane. As the needle passed through fascia iliaca, the fascia was first seen indented by the needle. As the needle eventually pierced the fascia, a "pop" was felt, and the fascia was seen to "snap" back on the ultrasound image. After negative aspiration, 30 ml of 0.2% Bupivacaine was injected in the Group B and 30 ml of Normal Saline in the Group A, between the fascia and the iliopsoas muscle, with necessary needle repositions.

After completion of the surgical procedure and the block, patients were transferred to the post anaesthesia care unit (PACU). The presence and severity of pain was assessed systematically. This assessment was performed in the PACU at 0, 2, 4, 6, 8, 10, 12, 18 and 24 hours after FICB. All the patients were asked to give scores for their pain at rest, the severity of which was measured using a Visual Analogue Scale (VAS; 10 cm unmarked line in which 0 cm = no pain and 10 cm = worst pain imaginable). If the patients still complained of pain even after the administration of postoperative analgesic regimen, intravenous Pentazocine at an incremental dose of 15mg was given as rescue analgesia. The time to first dose of rescue analgesic was recorded. The study ended 24 hours after FICB.

RESULTS

Parameters	Group A	Group B	P value
Age in years	54.80±16.65	54.80±16.65	0.605
Height in cm	158.70±6.55	156.55±9.65	0.299
Weight in kg	56.10±5.44	58.20±8.83	0.272
Sex ratio (M:F)	17:13	13:17	

Table – 1: Demographic characteristics

Table – 2: Duration of surgery

	Group A	Group B	P value
Duration of surgery (in min)	112.66±20.07	109.16±20.80	0.51

Chart – 1: Comparison of duration of analgesia in the two groups

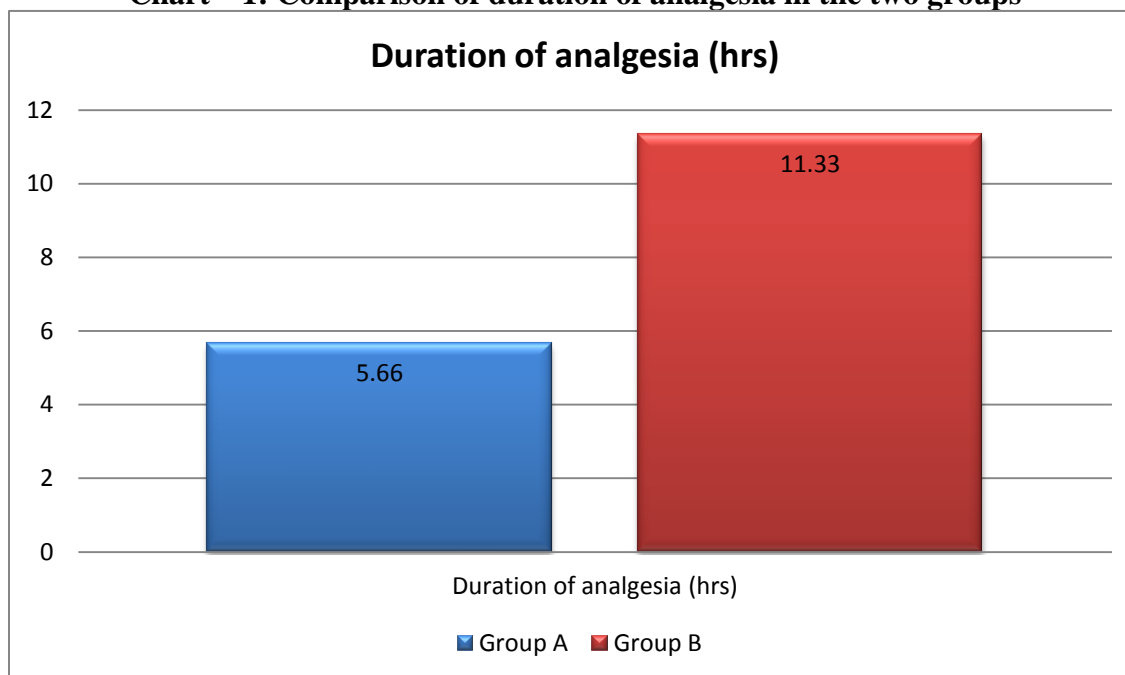
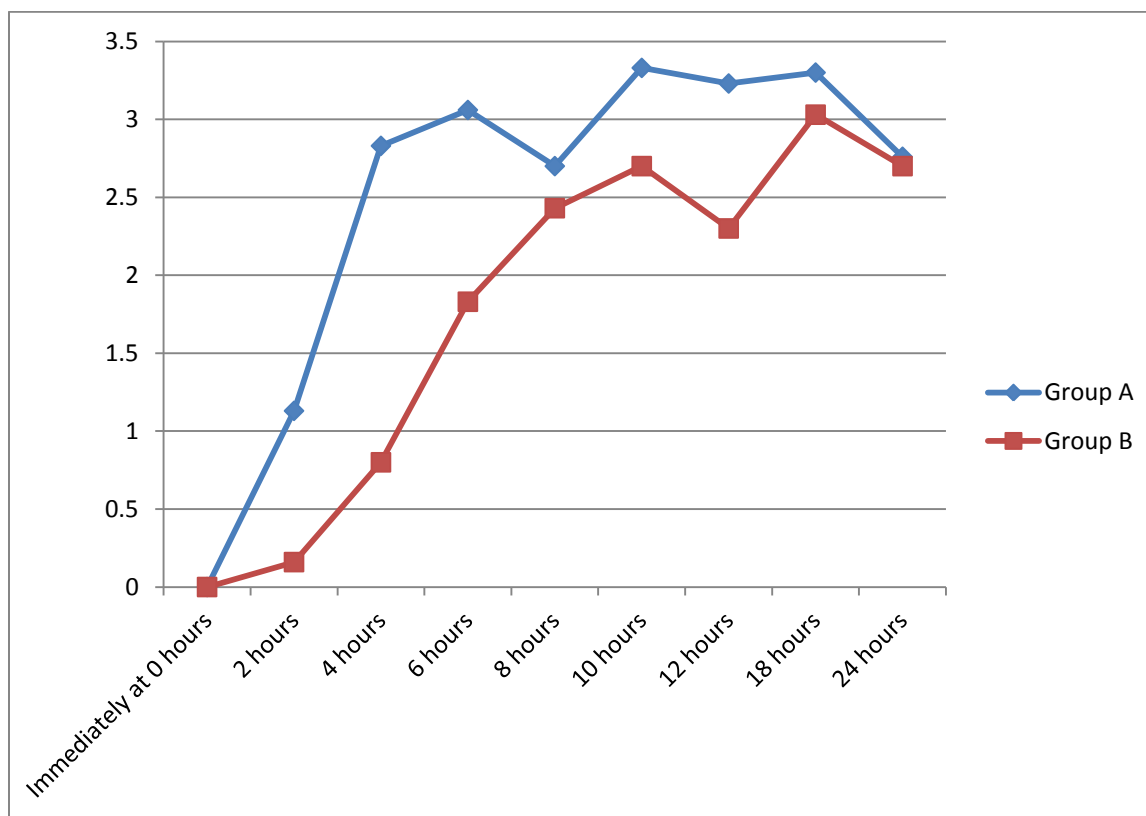


Chart – 2: Trends of Visual Analogue Score (VAS) at different intervals in the two groups

DISCUSSION

In our study, duration of analgesia i.e., time to first dose of rescue analgesic was 5.66 ± 1.49 hours in Group A and 11.33 ± 3.45 hours in Group B (FICB). The duration of analgesia was significantly longer in Group B (Chart-1). It coincides with Pandya and Jhawar (2014), who studied the comparison of FICB (Group I) with three-in-one block (Group II) on 30 patients after the surgery using 35-40 ml of 0.25% Bupivacaine in both groups and found the duration of analgesia in FICB group to be 12.97 ± 3.06 hours and 11.93 ± 3.02 hours in 3 in 1 group, which is comparable to the duration of analgesia in our study [9]. Similarly, Raiger et al (2019) in their study evaluated duration of analgesia in fracture neck of femur surgeries in 45 patients in three groups of 15 each. Group L received FICB 30 ml of 0.25% Levobupivacaine, Group B received FICB with 30 ml of 0.25% Bupivacaine and Group T did not receive block [10]. Duration of analgesia in their study was 14.08 ± 6.33 hours with Bupivacaine, which was longer than our study which can be supported with

the duration of surgery being shorter in their study group (68.67 ± 22.79 min) as compared to our study group (109.16 ± 20.80 min). Shukla et al (2018), studied 105 patients with fracture neck of femur. They compared FICB with Femoral Nerve Block and no block [11]. They found that duration of analgesia in FICB group was 8.09 ± 1.86 hours, which is comparable to our study.

Pandya and Jhawar, at the end of their study asked the patients about the quality of postoperative analgesia (excellent, good, poor) and found quality of analgesia was rated as excellent by 76.67%, good by 16.66% and poor by 6.67% of the patients in FICB group. Yun et al., in 2009 studied the comparison of Fascia Iliaca Compartment Block (FIC group) with Intravenous Alfentanil (IVA group) for positioning for spinal anaesthesia in 40 patients undergoing femoral neck fracture surgery in two groups of 20 each. Patient acceptance (yes/no) was also significantly better in the FIC group (19/1) than in the IVA group (12/8) ($P < 0.05$) [12].

In our study, we did not find any complications related to the block procedure and no side effects of the study drug were seen which is consistent with Pandya and Jhawar, who did not find any incidence of side-effects like hematoma, accidental intra vascular injection, block failure, or local anaesthetic toxicity during their study in any patients of both the groups.

LIMITATIONS

Pain is a subjective experience, hence can be difficult to quantify objectively and compare using VAS.

CONCLUSION

Fascia Iliaca Compartment Block (FICB) is an effective, safe and easy to perform technique for post operative pain management after proximal femur fracture surgeries and it provides excellent comfort and pain relief during the first 24 hours of the post operative period.

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