Brazilian Journal of Anesthesiology xxxx;000(xxx): 1–3

Sociedade Brasileira de Anestesiologia

Brazilian Journal of ANESTHESIOLOGY

LETTER TO THE EDITOR

Does adding lateral femoral cutaneous nerve block improves the analgesia of pericapsular nerve group block in the fractured hip surgeries?*

Dear Editor,

Patients undergoing surgery for fractured hip often are elderly with comorbidities, hence pain management remains a challenge. The current literature has suggested that Ultrasound-Guided (USG) Pericapsular Nerve Group block (PENG block) is a safe and effective analgesic technique in such patients.[1] Most hip surgeries require lateral incision, which involves the cutaneous supply by the branches of the Lateral Femoral Cutaneous Nerve (LFCN). Case reports have shown that blocking the LFCN may provide an additional advantage to the PENG block in terms of quality and duration of analgesia.[2,3] However, supportive literature based on detailed scientific study was lacking. Hence, we conducted a prospective, double blinded, randomized study to compare PENG block with a combination of PENG block and LFCN block for efficacy of analgesia in fractured hip surgery.

After approval from the hospital ethical Committee and Registration with Trial Registry (CTRI), a prospective randomized trial was done at a teaching industrial hospital from April 2021 to December 2021. After informed written consent, 60 patients were randomized into two equal groups: Group P (PENG block, n = 30) and Group PL (PENG block +LFCN block, n = 30). Patients of both sexes aged 18–80 years with severe pain due to hip fracture were included. Patients who refused to participate, having severe cardiovascular disease, contraindication for regional anesthesia, history of hip surgery within three months, and having difficulty in communication due to hearing loss were excluded from the study. Patients were assessed for pain by the Numeric Rating Score (NRS) where 0 = no pain and 10 = most severe pain. Patients with NRS < 5 at rest were excluded from the study. Patients who were non-compliant to the study protocol during the study period were also excluded from analysis. In both groups, ultrasound guided PENG block was performed with a curvilinear low-frequency ultrasound probe (2–5 MHz) in the supine position (Fig. 1 A and B). In group P, 30 mL 0.5% ropivacaine and 8 mg dexamethasone was injected, and in group PL, a 30 mL mixture of 0.5% ropivacaine + 8 mg dexamethasone was prepared and a 25 mL mixture was injected, and the remaining 5 mL drug was used for LFCN block. In group PL, to block the LFCN, a high frequency ultrasound transducer/probe (6–13 MHz) was used (Fig. 1 C and D).

After 30 minutes of completion of the block NRS was assessed for pain during rest and movement by passively lifting the Limb 15° above the resting level by an observer who was unaware about the groups. After that, patients were positioned in the sitting position for spinal anesthesia, and Ease of Spinal Positioning (EOSP) was assessed using a four-point scale (0 = unable to position, 1 = patient had pain or abnormal posturing, 2 = discomfort or require support for positioning, 3 = optimal). Patients who were unable to position (score = 0) were given additional analgesic (ketamine 10–20 mg + fentanyl 10–20 μg) and were excluded from the study. All the patients were given standard spinal anesthesia with a mixture of 1.4 mL 0.5% bupivacaine and 0.4 mL (20 μg) fentanyl. Postoperative analgesia was continued with Injection paracetamol 1 g every 8 hours and Injection tramadol 50 mg intravenously when pain was > 3 on NRS. Patients were assessed at intervals of 4, 6, 8, 10, 12, 24 hours. The primary objective was to compare the Numeric Pain Scores (NRS) during rest and movement. Secondary objectives were to compare Ease of Spinal Positioning (EOSP), duration of analgesia (first request to rescue analgesia with tramadol), and total tramadol consumption in 24 hours.

The results were analyzed using statistical software (MedCalc version 20.0). Normally distributed data (represented as Mean ± SD) was assessed using the Student's *t*-test. Non-normally distributed data and ordinal data were represented as median & Interquartile Range (IQR) and assessed using the Mann-Whitney U-test. A p-value < 0.05 was considered significant.

All 60 patients completed the study. Our results showed no significant difference in NRS at rest or on movement in group P and group PL at all-time points of 4, 6, 8, 12, and 24 hours ($p > 0.05$). The first request to rescue analgesia (duration of block) was significantly longer in group PL, mean (SD)

* Presentation at a meeting: As a poster at National Conference of Indian Society of Anaesthesiologists 2021. IRB number: # Anaesth/00-01/2021 [18.01.21]. Clinical trial registration number: CTRI Number CTRI/2021/04/032822 [Registered on: 15/04/2021] - Trial Registered Prospectively.

https://doi.org/10.1016/j.bjane.2022.06.005

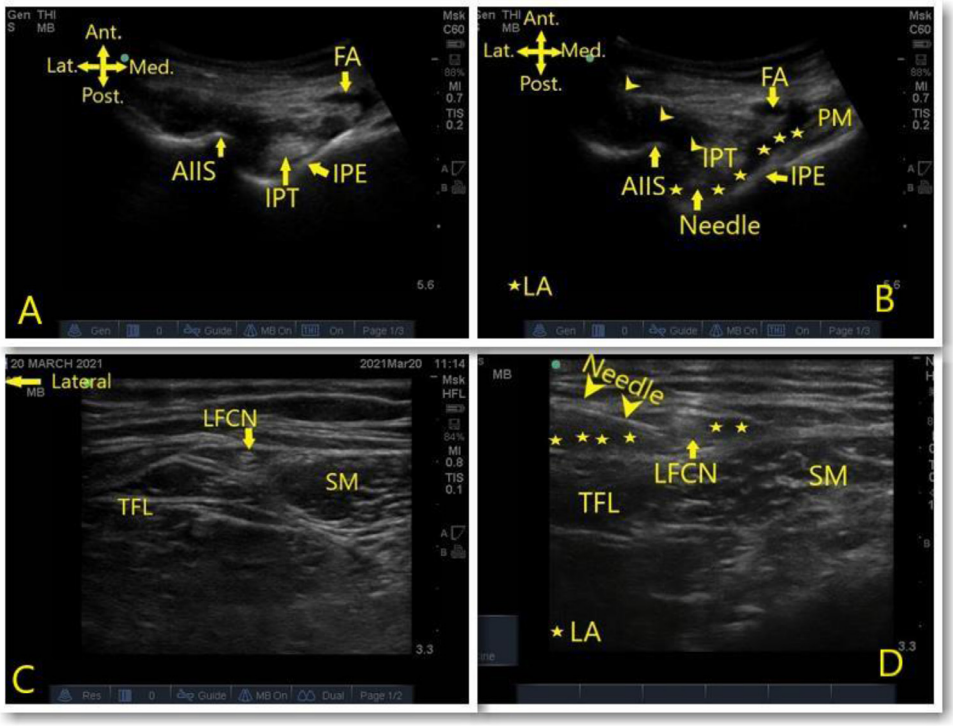

Figure 1 (A) Sonoanatomy of PENG block, (B) Block needle entry from lateral to medial in an in-plane approach and the needle tip between the psoas tendon anteriorly and the pubic ramus posteriorly, (C) Sonoanatomy of LFCN block showing LFCN at the lateral margin of sartorius muscle, (D) Block needle entry from lateral to medial and spread of local anesthetic around the LFCN nerve. AIIS, Anterior Inferior Iliac Spine; IPE, Iliopubic Eminence; IPT, Iliopsoas Muscle Tendon; PM, Pectineus Muscle; FA, Femoral Artery; LFCN, Lateral Femoral Cutaneous Nerve; TFL, Tensor Fasciae Latae; SM, Sartorius Muscle (SM), LA, Local Anesthetic; Ant., Anterior; Post., Posterior; Lat., Lateral; Med., Medial.

15.26 (4.25) h, than in group P, 10.9 (3.17) h ($p < 0.0001$). Tramadol consumption, median (IQR) in 24 hours, was significantly higher in group P 75 (150–50) mg than in group PL 50 (50–50) mg ($p = 0.012$). The EOSP score, median (IQR), was not significantly different in group P 3 (3–2) and group PL 3 (3–2) ($p = 0.83$).

PENG block is a novel ultrasound guided technique which has been used successfully to improve Ease of Spinal Positioning (EOSP).[1,4] Morrison et al. have reviewed the usefulness of PENG block and found it very effective.[5] In our study, we observed significant improvement in NRS after block ($p < 0.00001$) and EOSP in both groups.

Two previously published case reports found that addition of LFCN was more effective in providing postoperative analgesia for hip surgery.[2,3] In our study we observed that addition of LFCN improved the duration of request to first rescue analgesia and 24 hours tramadol consumption. We also conducted subgroup analysis of patients with either lateral or posterolateral incision. However, the difference was not statistically significant ($p = 0.31$).

The novelty of the present study was that there has been no such comparative study yet published. However, there were a few limitations in our study, Firstly, sensory testing was not done for LFCN. The study was also not adequately powered to detect a significant difference influenced by site of incision.

To conclude, combining LFCN block with PENG block improves the duration of analgesia and reduces the requirement of rescue analgesics.

Conflicts of interest

The authors declare no have conflicts of interest.

References

1. Giron-Arango L, Peng PWH, Chin KJ, Brull R, Perlas A. Pericapsular Nerve Group (PENG) block for hip fracture. Reg Anesth Pain Med. 2018;43:859–63.
2. Thallaj A. Combined PENG and LFCN blocks for postoperative analgesia in hip surgery-A case report. Saudi J Anaesth. 2019;13:381–3.
3. Roy R, Agarwal G, Pradhan C, Kuanar D. Total postoperative analgesia for hip surgeries, PENG block with LFCN block. Reg Anesth Pain Med. 2019;44:684.
4. Sahoo RK, Jadon A, Sharma SK, Peng PW. Peri-capsular nerve group block provides excellent analgesia in hip fractures and positioning for spinal anesthesia: A prospective cohort study. Indian J Anaesth. 2020;64:898–900.
5. Morrison C, Brown B, Lin DY, Jaarsma R, Kroon H. Analgesia and anesthesia using the pericapsular nerve group block in hip surgery and hip fracture: a scoping review. Reg Anesth Pain Med. 2021;46:169–75.

Ashok Jadon [a,*], Surabhi Srivastawa [a], Apoorva Bakshi [a], Rajendra K. Sahoo [b], Bhupendra K. Singh [a], Neelam Sinha[a]

[a] *Tata Motors Hospital, Telco Colony, Department of Anesthesia & Pain Relief Service, Jamshedpur, Jharkhand, India*

[b] *Kalinga Institute of Medical Sciences, India, and Morphological Madrid Research Centre (MoMaRC), Department of Anaesthesiology and Pain Management, Madrid, Spain*

[*] Corresponding author.
E-mail: jadona@rediffmail.com (A. Jadon).
Received 19 February 2022; accepted 15 June 2022
Available online xxx