

CASE SERIES: PERICAPSULAR NERVE GROUP (PENG) BLOCK FOR HIP ANALGESIA

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INTRODUCTION

PENG (PERicapsular Nerve Group) block is a novel ultrasound-guided approach for blockade of articular branches of the hip joint and nearby structures. Previously, fascia iliaca block (FIB) and femoral nerve block (FNB) are commonly used for analgesia in hip fracture patients. However, the effect size of analgesia from these blocks is only moderate,¹ and literature suggests that the obturator nerve is not covered.^{2,3} Furthermore, a recent anatomical study on hip innervation led to the identification of relevant landmarks to target the hip articular branches of femoral nerve (FN) and accessory obturator nerve (AON). In this report, we describe the technique and its application in 3 consecutive patients.

METHODS

PENG block was performed with the patient in supine position, using Sonosite M-Turbo (Bothell, WA, USA) ultrasound guidance with a curvilinear low-frequency ultrasound probe (2-5 MHz). Transducer was placed in a transverse plane over the anterior inferior iliac spine and then aligned with the pubic ramus by rotating the probe counter-clockwise about 45 degrees (Figure 1). In this view, the iliopsoas muscle and tendon, the femoral artery and pectinus muscle are observed. Needle was inserted from lateral to medial in plane with the ultrasound beam and 30mls of ropivacaine 0.5% were injected in the plane between the iliopsoas tendon and the pubic ramus.



Figure 1

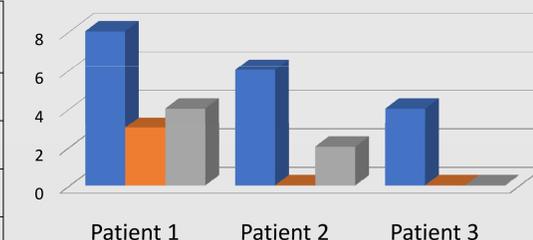
AIIS : Anterior Inferior Iliac Spine, FA: Femoral Artery, PT: Iliopsoas tendon, IPE: Iliopubic Eminence, LA: Local anaesthetic

RESULTS

The PENG block was performed in three patients with hip fractures. Demographic data is shown in Table 1. Baseline pain score was obtained and patients were assessed for pain score upon rest and on movement 24 hours post block (Graphic 1). These patients were on multimodal analgesia (oral paracetamol 1g 6 hourly and oral tramadol 100mg 8 hourly) when their pain score were assessed 24 hours post operatively.

	Patient 1	Patient 2	Patient 3
Gender	Male	Male	Female
Age (years)	26	55	76
ASA	I	II	II
Side	Left	Right	Left
Diagnosis	Closed fracture midshaft femur	Complex fracture of pelvis	Neck of femur fracture
Operation	Interlocking nail of femur	Plating of pelvis	Thompson hemiarthroplasty

Table 1: Demographic data



Graphic 1

Pain score: Baseline, upon rest and on movement 24 hours after PENG block

■ Baseline pain score
 ■ Pain score 24 hours upon rest
 ■ Pain score 24 hours on movement

DISCUSSION

- ✓ Peripheral nerve blocks are commonly used for pain management in patients with hip fractures as they provide reasonable analgesia with an opioid-sparing effect and are relatively safe.
- ✓ A recent anatomic study showed that the articular branches from the FN to the hip joint enter the iliacus muscle at the L4-L5 level and course deep to the psoas muscle and tendon between the AIIS and IPE before innervating the hip capsule.
- ✓ The AON courses deep to the medial aspect of psoas muscle around the L5 level.
- ✓ PENG block targets the articular branches of AON and FN between AIIS and IPE.

- ✓ The median reduction of pain in our case series was 4 points.
- ✓ Interestingly, the patients in our case report presented with different hip pathologies, and all 3 of them reported significant dynamic pain relief.
- ✓ In addition, given that our technique targets only the sensory branches, there is a potential motor-sparing effect compared with both the FIB and the FNB.
- ✓ This is only a small case series, and there are limitations inherent to this type of publication, such as lack of ability to generalize, publication bias, danger of overinterpretation, and retrospective design.

CONCLUSIONS

These three cases illustrate the potential use of PENG block as an alternative for FIB and FNB not just for hip surgeries, but also for proximal femur procedures as well. Further randomised control trials with larger sample need to be conducted in order to determine its efficacy.

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