

# Ultrasound Guided Pericapsular Nerve Group and Lateral Femoral Cutaneous Nerve Block for Perioperative Analgesia in a Patient with Ischemic Heart Disease on Anticoagulants Posted for Corrective Hip Surgery

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## Abstract

**Introduction :** Ultrasound guided pericapsular nerve group block is an approach to block the articular branches of femoral, obturator and accessory obturator nerves that supply the anterior hip capsule and has been found to provide good perioperative analgesia.

**Case Report:** An 86 year old male, who suffered fracture neck of femur after an alleged slip and fall, was posted for emergency corrective surgery. Perioperative evaluation revealed ischemic heart disease, status post PTCA with preserved LV systolic function and on oral anticoagulant rivaroxaban and antiplatelet medication clopidogrel. Coagulation profile was within acceptable range. Cardiac Troponins and Brain Natriuretic peptide (BNP) were measured. General anesthesia was planned to this patient in view of relative contraindication to central neuraxial block i.e. patient being on anticoagulants. Perioperative analgesia was provided with ultrasound guided pericapsular nerve group block for fracture site pain and lateral femoral cutaneous nerve block for surgical incision pain. Patient had stable hemodynamic with improved pain score (VAS & lt; 3) in the immediate postoperative period. There was no evidence of post-operative delirium and perioperative myocardial injury.

**Conclusion :** Ultrasound guided superficial regional nerve group block such as Pericapsular nerve group block, lateral femoral cutaneous nerve block can provide effective postoperative analgesia in patients where central neuraxial blocks are contraindicated.

**Keywords :** Anticoagulants, Hip fracture, Regional anesthesia.

**Key Messages:** Acute pain management in elderly patients is quite challenging to anesthesiologists due to medical comorbidities such as ischemic heart disease patients who experience greater pain are at increase risk in post operative period and patients on anticoagulants where central neuraxial blockade are contraindicated. Perioperative analgesia helps in intraoperative hemodynamic stability and post operative analgesia.



## Introduction

Acute pain management of displaced femoral neck fractures in elderly patients is quite challenging to anesthesiologists due to physiological frailty, medical comorbidities, and cognitive impairment. Patients who experience greater pain are at increase risk of postoperative delirium, prolonged hospital stay and poorer health related quality of life. Ultrasound guided Pericapsular nerve group block is an approach to block the articular branches of femoral, obturator and accessory obturator nerves that supply the anterior hip capsule and has been found to provide good perioperative analgesia.<sup>1</sup>

## Case Report

An 86 year old male, who suffered fracture neck of femur after an alleged slip and fall, was posted for emergency corrective surgery. Perioperative evaluation revealed ischemic heart disease, status post PTCA with preserved LV systolic function and on oral anticoagulant rivaroxaban and antiplatelet medication clopidogrel. Coagulation profile was within acceptable range. Cardiac Troponins and Brain Natriuretic peptide (BNP) were measured. General anesthesia was planned to this patient in view of relative contraindication to central neuraxial block i.e. patient being on anticoagulants. After informing the risks involved in the perioperative period that include peri-operative myocardial injury, bleeding and hemodynamic instability, written informed consent was obtained from the patient. Intraoperative monitoring included ECG, SpO<sub>2</sub>, Invasive blood pressure (IBP) and capnography. Careful induction of general anesthesia was done with graded doses of propofol and fentanyl, monitoring IBP all the time. Response to laryngoscopy was blunted with preservative free lignocaine i.v and succinylcholine was used for facilitating intubation. Perioperative analgesia was provided with ultrasound guided pericapsular nerve group block for fracture site pain and lateral femoral cutaneous nerve block for surgical incision pain. A local anesthetic mixture was prepared with 30 ml of 0.25% bupivacaine and 8 mg of dexamethasone. 20 ml of this mixture was used for PENG block and remaining 12 ml was used for lateral femoral cutaneous nerve block. Intraoperatively, hemodynamic variables were stable. Extubation was performed at the end of surgery following a smooth recovery from neuromuscular blockade. Visual analogue scale for pain was < 3 in the immediate postoperative period. There was no evidence of post-operative delirium. Trop T and BNP repeated 48 hours after surgery were comparable to preanesthetic values indicating

no evidence of perioperative myocardial injury.

## Discussion

Hip joint innervation is complex with nociceptors predominantly found in the anterior hip capsule and mechanoreceptors found in posterior capsule. Articular branches of femoral, obturator and accessory obturator nerve (AON) supply the hip joint.<sup>1</sup> Post-operative pain management for hip fracture surgery has always been a challenging goal. Multiple regional techniques have been used in the past, but there is no "best proven intervention" for hip analgesia. The main regional techniques include lumbar plexus block, lumbar epidural, femoral nerve block, sciatic nerve block, Fascia iliaca compartment block (FiCB), pericapsular injection, or obturator nerve block. Patients on anticoagulants are not ideal for deeper blocks that include epidural and lumbar plexus blocks. FiCB and femoral nerve blocks, though easier to perform, have been associated with quadriceps weakness. Also there is an ambiguity in nerve supply to hip capsule, with high articular branches arising from femoral and accessory obturator nerves in more than 40% of the population. A recent study has demonstrated evidence supporting the efficacy of FiCB and PENG blocks for producing a significant reduction in pain within 30 minutes of block placement.<sup>2</sup> The benefits of the PENG block include comfortable patient positioning for the procedure, no significant motor weakness, potential motor sparing effect, and superior analgesic efficacy.

The disadvantage is that it cannot be used as a sole anesthetic block for hip surgery and it can be used in combination with other nerve blocks like FICB for more extensive analgesia for hip surgery.<sup>3</sup> This reveals that PENG blocks may be a useful regional anesthetic technique for postoperative analgesia for primary hip surgery. PENG blocks in combination with lateral femoral cutaneous (LFCN) nerve block or local infiltration analgesia (LIA) may be needed for surgical incision pain. Myocardial Injury after Non cardiac surgery (MINS) is a potential perioperative complication that is not commonly looked into. MINS is more likely to occur in patients who have increased risk factors. Monitoring such high risk patients with Cardiac biomarkers especially NT-Pro BNP has been used for early detection of MINS.<sup>4</sup> In our patient, who had IHD with PTCA status, BNP levels were not elevated more than pre-surgical level in the post-operative period.

## Conclusion

PENG block is an effective regional analgesic

technique for surgeries involving hip fracture. PENG block together with Lateral femoral cutaneous nerve block can provide stable intraoperative hemodynamics with good postoperative analgesia, especially in elderly high risk patients undergoing corrective surgery. BNP can be used for monitoring MINS, in such high risk patients.

**Conflict of Interest:** Nil

## References

1. Kukreja P, Avila A, Northern T, Dangle J, Kolli S, Kalagara H. A Retrospective Case Series of Pericapsular Nerve Group (PENG) Block for Primary Versus Revision Total Hip Arthroplasty Analgesia. *Cureus* 2020;19;1-8.
2. Allard C, Pardo E, de la Jonquière C, Wyniecki A, Soulier A, Faddoul A, Tsai ES, Bonnet F, Verdonk F. Comparison between femoral block and PENG block in femoral neck fractures: A cohort study. *PLoS One*. 2021; 4;1-11.
3. Kukreja P, Schuster B, Northern T, Sipe S, Naranje S, Kalagara H. Pericapsular Nerve Group (PENG) Block in Combination With the Quadratus Lumborum Block Analgesia for Revision Total Hip Arthroplasty: A Retrospective Case Series. *Cureus*. 2020;23;1-7.
4. Sessler DI, Khanna AK. Perioperative myocardial injury and the contribution of hypotension. *Intensive Care Med*. 2018;44;811-822.

