OPEN ACCESS ISSN: 2835-9496 Das S, et al. (2024): 367
DOI: 10.47991/2835-9496/AJCMR-115

Research Article American Journal of Clinical and Medical Research

Perioperative Analgesia with Continuous Pericapsular Nerve Group (Peng) Catheter in A Challenging Patient with Fracture Neck of Femur: A Case Report

Dr. Samaresh Das, MD, DESA, EDPM (EFIC)[1*], Dr Nilay Chatterjee. MD, DM, DESA, EDPM[2], Dr Agnieszka Kubisz Pudelko[3], Dr Ahmed Tolba, MD, DESA[4], Dr Sumit Bajaj, DA, DNB, EDAIC, FRCA[5]

[1]Consultant Anaesthetist and Pain management, Buckinghamshire Healthcare NHS Trust, Stoke Madeville Hospital, HP21 8AL Telephone: (+44) 07960 532682; Email: drsamareshdas@gmail.com
[2]Consultant Anaesthetist and Pain management, Oxford University Hospital, Telephone: (+44) 01935 474042; Email: nilay.chatt@gmail.com
[3]Consultant, Anaesthesia, Yeovil District Hospital NHS Foundation Trust, Yeovil BA21 4AT, Somerset, United Kingdom, Email: Aga.pudelko@ydh.nhs.uk; Mobile: 07400443052.
[4]Speciality Doctor, Anaesthesia, Yeovil District Hospital NHS Foundation Trust, Yeovil BA21 4AT, Somerset, United Kingdom Telephone: (+44) 07394812606; Email: Ahmed.tolba@ydh.nhs.uk
[5]Consultant, Anaesthesia, Queens Hospital, Romford, London, Email: drsumit27@gmail.com; Mobile +447448055994

***Corresponding author:** Dr Samaresh Das. MD, DESA, EDPM (EFIC), Consultant Anaesthetist and Pain management, Buckinghamshire Healthcare NHS Trust, Stoke Madeville Hospital, HP21 8AL, Telephone: (+44) 07960 532682.*

***Citation:** Das S, Chatterjee N, Pudelko AK, Tolba A, Bajaj S (2024) Perioperative Analgesia with Continuous Pericapsular Nerve Group (Peng) Catheter in A Challenging Patient with Fracture Neck of Femur: A Case Report. Ameri J Clin Med Re: AJCMR-115.*

***Received Date:** 27 December, 2023; **Accepted Date:** 08 January, 2024; **Published Date:** 12 January, 2024*

Introduction

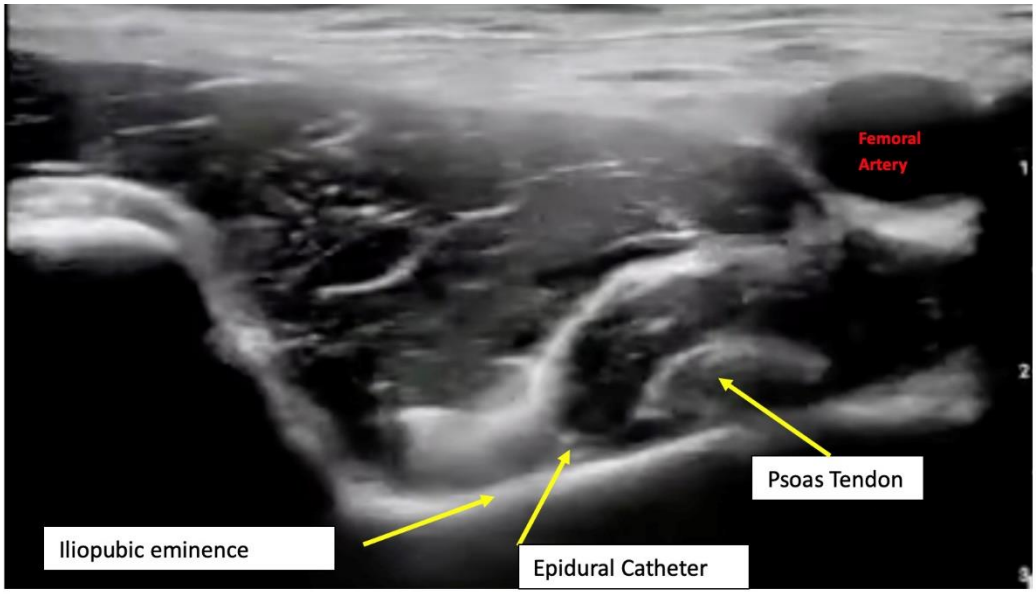
Managing pain for the elderly and frail patients with fracture neck of the femur is a challenge because of their multiple comorbidities. Usually, those patients are better managed perioperatively using multimodal analgesia, including regional nerve block, to reduce the side effect of other medications, mainly opioids. We have succeeded in controlling the perioperative analgesia with a Pericapsular nerve group (PENG) catheter with intermittent local anaesthesia in a challenging patient admitted with a fractured neck of the femur.

Our Case

An 84 years old female body weight of 35.4 (BMI 16.6 kg/m^2) with a known case of hypertension, congestive heart failure, Interstitial lung disease (Fig 1. X-ray chest), and chronic renal failure (eGFR 24.9) presented with a history of fall at home. She complained of severe right-sided groin pain, inability to move her right leg, and the shorter right leg turned outwards. Her X-ray revealed a right-sided neck of femur fracture. She was allergic to Nonsteroidal anti-inflammatory drugs and morphine. In the emergency room, landmark guided fascia illiaca block was given by emergency team using levobupivacaine 0.25% 15 mls and paracetamol 500 mg intravenously (according to her body weight). In addition, she was prescribed oxycodone immediate release liquid 2.5 mg as and when needed. She was admitted to the orthopaedic ward for optimisation before surgical correction. However, her static pain (pain at rest) was partially controlled with fascia illiaca block, and her pain in numerous rating scores (NRS) was 5/10 after 1 hour. After initial stabilisation (12 hours of admission), scheduled for right-sided hemiarthroplasty.

Figure 1: X-ray chest

During the immediate preoperative period before transferring the patient to the operating room, her static pain score was 6/10, and dynamic pain score was 8-9/10 on numerous rating scales. She became very drowsy after getting 2.5 mg of oxycodone immediate release and required supplemental oxygen. Therefore, we decided for an alternative perioperative analgesia plan. She was not suitable for general anaesthesia considering her lung, heart and kidney condition. We decided for spinal anaesthesia as the sole technique for the surgery; however, it was difficult to position for the spinal anaesthesia. Therefore, we decided to ultrasound (sonosite edge, liner probe) guided right-sided PENG block using 15 ml of 1% lidocaine with adrenaline 1: 200,000 before positioning. We used the liner transducer because her BMI was very low and anatomy was very obvious. At the same time, we inserted the catheter (epidural catheter) 3 cm inside the PENG space under direct ultrasound vision (Fig.2).



The catheter was fixed with a sterile dressing. After 15 minutes of the PENG block, we positioned the patient sitting comfortably. Spinal anaesthesia was given at L3-4 level using bupivacaine heavy 2 mls (10 mg) after having a clear flow of cerebrospinal fluid. The anaesthesia level (sensory level of the block) was checked with cold spray before positioning the patient for surgery. Postoperatively the patient was transferred to recovery and then to the ward after motor recovery. She did not receive any additional analgesia during the procedure. Her postoperative pain was managed with intravenous paracetamol 500 mg IV and an intermittent bolus of levobupivacaine 0.25% 8 mls every six hours via the PENG block catheter. She was mobilised after 12 hours very comfortably. We kept the PENG catheter for 72 hours; during that period, she did not require any opioids.

Discussion

The fractured neck of the femur is increasingly common injury in the surgical emergency due to the growing population age (1). Those fractures are sometimes associated with low-energy trauma, e.g., a history of falls (2). The pain related to the fracture neck of the femur in the older population is difficult to manage because of multiple comorbidities. If the pain is not managed effectively from the beginning, there is a high probability of developing delirium, difficulty in mobilisation, prolonged hospital stay and poor quality of life (3). The best option to manage the pain for those age groups is using multimodal analgesia, mainly consisting of regional nerve block, paracetamol, Nonsteroidal anti-inflammatory drugs (NSAIDs), opioids etc. However, sometimes it is very challenging to choose which mode of analgesia is superior to others depending on the patient's clinical situation. The use of opioids in these populations is a significant negative factor for outcomes considering their age and comorbidity.

Fascia illiaca block (FIB) is a prevalent analgesia technique. It reduces pain and has an opioid-sparing effect. In older patients use of opioids is one of the contributory factors for falls, prolonged hospital stays, and the development of delirium (4).

Recently, the PENG block gained popularity as an alternative to FIB for fracture neck of the femur. In their case series, A. Rocha Romeo-Romero et al. described ultrasound-guided PENG block as very effective, requiring less volume of local anaesthesia agent, lasting longer than other regional nerve blocks, and have an opioid-sparing effect. (5) They used single shot injection in the emergency room for pain management. Another prospective comparative study by A Fahey et al. (6) describes PENG block as a safe and effective technique for analgesia after hip fracture. Continuous PENG block using a catheter was recently used as an adjuvant analgesia technique after total hip arthroplasty by Takashi Fujino et al. (7). It provided adequate analgesia without motor blockade. In a recent case series by Del Buono R. et al. l (8) successfully managed 10 cases of the hip fracture using continuous PENG catheter. However, they mentioned the possible risk of intravascular catheter placement in this highly vascular area. They also expressed further studies for better technical skills to overcome any complications.

Our patient was very fragile (BMI 16.6 kg/m^2), and due to her chronic medical conditions, NSAIDs were not suitable. We gave landmark-guided FIB in the emergency room; however, it was not very useful for dynamic pain, and even transferring to the operating room was also very painful. We have prescribed low-dose oxycodone as analgesia; however, she was not very comfortable with that. She developed nausea and vomiting and became very drowsy after one dose of oxycodone (2.5 mg) liquid immediate release. Therefore, we decided for PENG

block and the insertion of a catheter to manage her postoperative pain. Due to her poor chest condition, she was not suitable for general anaesthesia. We have positioned her in a sitting position for SAB after 15 minutes of PENG block with a bolus of local anaesthesia without any additional sedation and analgesia. At the end of the surgery, the surgeon infiltrated 0.25 % levobupivacaine at the incision site. She was very comfortable during the perioperative period. In the postoperative period, we injected levobupivacaine 0.25%, 8 mls every six hours up to 72 hours after negative aspiration. She was very comfortable. The pain nurse monitored her pain score in NRS every six hours; the average pain score was 1-2/10 in NRS. There was no motor weakness, and she was mobilised after 12 hours of operation. In addition, she was given paracetamol 500 mg tablet initial 24 hours and after that as and when needed. In our case, we dint observe any complications.

Conclusion

Ultrasound-guided PENG block is emerging very effective and safe alternative to FIB, any fracture or surgical intervention around the hip joint. Continuous infusion of local anaesthetics via the PENG catheter is still uncommon. However, some studies revealed that the dose requirement is significantly less than other nerve blocks for hip fractures. Due to the advantage of the motor-sparing effect, it is helpful for the patient for early mobilisation and early discharge from the hospital. However, further study is recommended for the estimation of the dose duration of the catheter to be in situ and to observe other complications.

Declaration of patient consent

Consent was obtained from the patent that clinical features and images would be used for publication purposes. We also explained to the patient that her name and identification would not be mentioned anywhere.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Australian and New Zealand Hip Fracture Registry (ANZHFR) Steering Group. Australian and New Zealand guideline for hip fracture care: improving outcomes in hip fracture management of adults. Sydney: Australian and New Zealand Hip Fracture Registry Steering Group. 2014. Google Scholar
2. Kazley J, Bagchi K. Femoral Neck Fractures. [Updated 2022 May 15]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK537347
3. Morrison RS, Magaziner J, McLaughlin MA, et al. The impact of postoperative pain on outcomes following hip fracture. *Pain* 2003; 103: 303– 11.
4. A. Scurrah, C. T. Shiner, J. A. Stevens, S. G. Faux Regional nerve blockade for early analgesic management of elderly patients with hip fracture – a narrative review First published: 26 December 2017 https://doi.org/10.1111/anae.14178
5. A. Rocha-Romero, K. Arias-Mejia, A. Salas-Ruiz, P. W. H. Peng Pericapsular nerve group (PENG) block for hip fracture in the emergency department: a case series 18 May 2021 https://doi.org/10.1002/anr3.12118
6. Fahey A, Cripps E, Ng A, Sweeny A, Snelling PJ. Pericapsular nerve group block for hip fracture is feasible, safe and effective in the emergency department: A prospective observational comparative cohort study. Emerg Med Australas. 2022 Dec;34(6):884-891. doi: 10.1111/1742-6723.14013. Epub 2022 Jun 14. PMID: 35701386; PMCID: PMC9796647.
7. Fujino et al. JA Clinical Reports (2021) 7:22 https://doi.org/10.1186/s40981-021-00423-1
8. Del Buono R, Padua E, Pascarella G, Soare CG, Barbara E. Continuous PENG block for hip fracture: a case series. Reg Anesth Pain Med. 2020 Oct;45(10):835-838. doi: 10.1136/rapm-2020-101446. Epub 2020 Aug 12. PMID: 32796133.