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Acetabular fracture - post operative analgesia. peng block an alternative approach

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Abstract--In hip fractures reductions the commonly used blocks are the femoral nerve block and fascia iliaca compartment block (FICB) analgesia and anesthesia. Since the articular branches that innervate the hip joint arise at a higher level along the course of the nerves.^[1] Hence these blocks may not provide sufficient analgesia for the hip fractures patients both pre-operatively and post-operatively. Introduction: To overcome this newer techniques are employed these days such as PENG block that are guided by ultra-sound. The pericapsular nerve group (PENG) block is a technique that involves deposition of local anesthetic in the musculofascial plane between the psoas muscle and the superior pubic ramus ^[2] This block has been recently described as an effective option for hip analgesia, as it targets the articular branches that supply the hip.^[3] It could be very useful for analgesia during the perioperative period. Hence this case report throws light on an intervention using PENG block before surgical correction of hip fractures.

Keywords--Intertrochanteric fracture, Acetabular fracture and iliac crest fracture, Throacolumbar scoliosis, PENG block.

Introduction

Presentation of case

HISTORY: A 68 year old male patient reported to the ER with alleged H/o fall at home 2 days back. Post injury patient was not able to bear any weight. Patient was then brought to (name) hospital and all necessary investigations were sent.

ON EXAMINATION: Patient's GCS was 15/15

Right lower limb was externally rotated

Tenderness was present over the greater trochanter and iliac crest region along with swelling present over the right hip.

Spinal examination: thoracolumbar scoliosis was observed

Clinical diagnosis

Patient was diagnosed to with intertrochantric fracture with acetabular fracture & iliac crest fracture right side with inferior facet fracture L2-L3 and planned for surgery.

The patients was assessed preoperatively and explained about PENG block. Written informed consent was obtained. Pain scores during active sideways movement of the fractured limb were noted before block administration. The VAS scoring criteria was used.

Differential diagnosis

The block was administered under ultrasound guidance with low frequency curvilinear probe. The probe was placed parallel to the inguinal crease, at the level of anterior superior iliac spine. The scanning was done with gradual caudad movement of the probe. After the anterior inferior iliac spine (AIIS) was visible, the probe was turned slightly medial until the hyperechoic continuous shadow of superior pubic ramus was visible. The target was the plane between these two structures. Aligning the pubic ramus in the center of the image and targeting the pubic ramus just medial to the AIIS, a standard 25G Quincke needle was introduced and 20 mL 0.125% bupivacaine with 4 mg dexamethasone was administered using ultrasound-guided out-of-plane technique. The spread of local anesthetic below the psoas tendon was noted. Pain scores were assessed ten minutes after the procedure and at the time of positioning. Patient had significant pain before PENG block assessed with visual analog scale (VAS) with a score of 9. After 10 minutes of block, the VAS score reduced during active movement to 2 thereby reducing symptomatic pain.

Pathological discussion with figures

The usage of general anaesthesia and regional anaesthesia have been commonly employed during the treatment of hip fractures. Regional anaesthesia are aimed at reducing the in-hospital morbidity and mortality.^[4]

It is of value while performing the multimodal pre-operative and post-operative care and management. It also reduces the neurotoxic effect and medical costs when compared with general anaesthesia.^[5]

Conventionally the usage of femoral nerve block and fascia iliac compartment block have commonly been used in hip fracture surgeries, total knee and hip arthroplasty, femoral head fractures, iliac fractures, etc^[6]

The femoral nerve block has been reported to significantly reduce opioid consumption and reduce pain scores post operatively. But due to the increased incidence of injury to the femoral vessels and nerve is the main disadvantage of this technique. Hence the iliac block was introduced to overcome this drawback by remotely anesthetising the femoral nerve to achieve adequate analgesia.^[7]

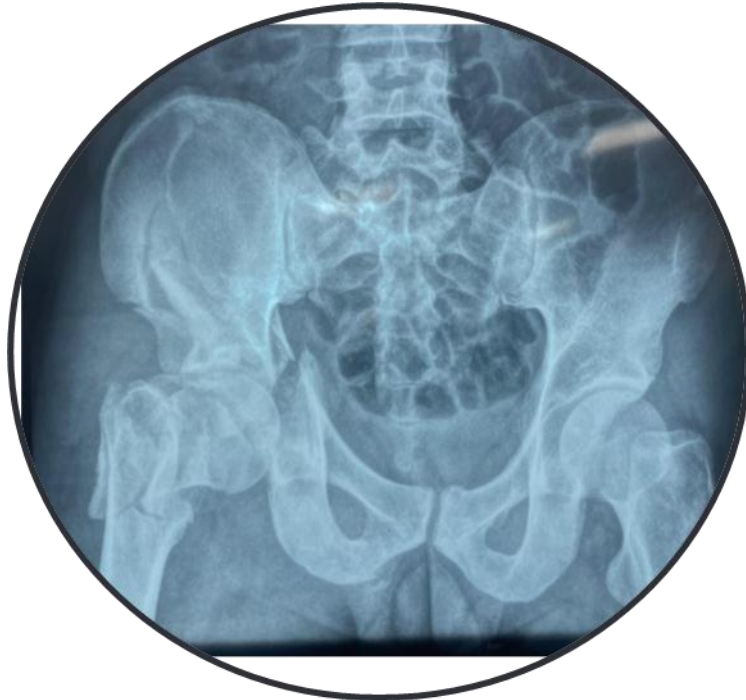


Figure 1: Hip joint X-ray

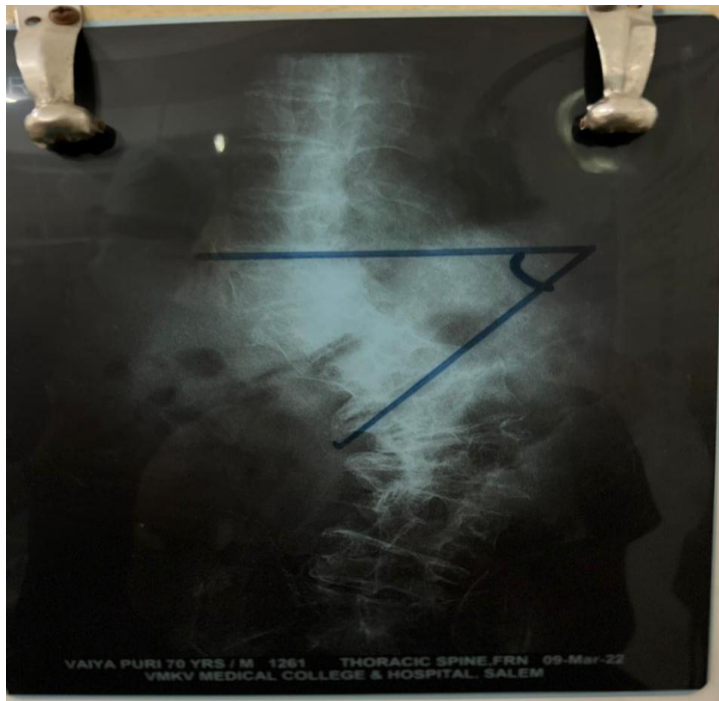


Figure 2: Spine x-ray- lateral view of throacolumbar spines

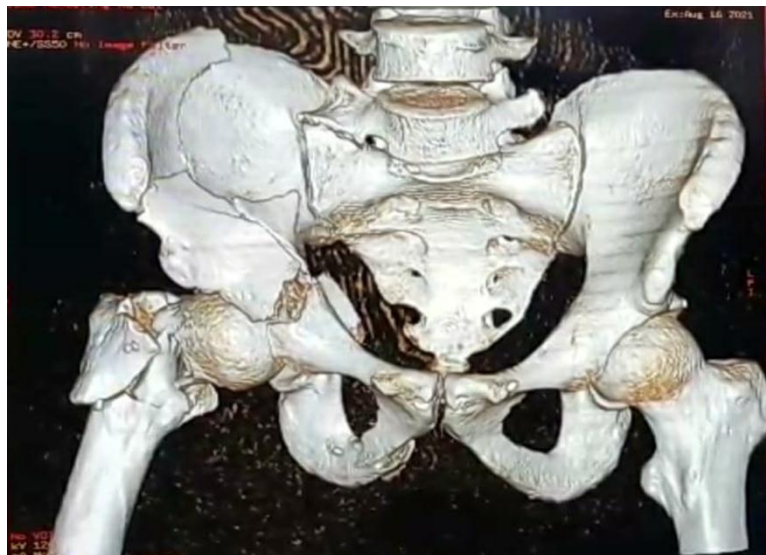


Figure 3: MRI IMAGE OF HIP JOINT



Figure 4: MRI IMAGE OF HIP JOINT- ACETABULAR FRACTURE

Discussion management

The PENG block was first introduced by L. Giron et al in 2018 as a novel -US guided technique in which the drug was delivered between the iliopubic eminence and iliopsoas muscle.^[3] This technique of depositing the LA drug in the interfascial plane the articular branches supplied by the obturator, femoral and accessory obturator nerves are anesthetised.^[8] Thus theoretically it covers a larger areas than the femoral block.^[9]

The out-of-plane technique was used in the current patient aiding to its ease in accessibility and visualisation. Archarya et al stated the difficulties and inconsistencies encountered while using the in-plane approach as the AIIS and femoral vessel proved to be a hindrance during drug delivery. The usage of out -of-plane approach provided a superior hand in anesthetizing the nerve.^[10]

The VAS score dropped from 9 to 2 after 10 minutes of PENG block administration. Allard et al concluded that Twenty-four hours after surgery, two (9%) patients in the "PENG block" group reported having a VAS ≥ 4 , versus three (14%) patients in the "femoral block" group ($p = 1.00$) was non-significant when compared.^[9] Archarya et al also presented a drop in the VAS scores to 2&3 in his case report with treatment of PENG block. ^[10]

Final diagnosis

The results of this case report is promising but with better understanding of the anatomy of hip innervation and the planes where the nerves lie, this new approach of nerve block may be extremely useful for analgesia in patients with

hip fractures. Larger studies are warranted to validate the efficacy and superiority of PENG blocks over conventional techniques.

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