

Case Series

Pericapsular Nerve Group Block as an Effective Intervention for Pain Relief and Improving Functional Mobility in Cancer Patients: A Case Series

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ABSTRACT

Pericapsular nerve group block (PENG) is an ultrasound-guided regional block technique that blocks the articular branches of the femoral nerve, accessory obturator nerve and obturator nerve. These nerves richly innervate the anterior capsule of the hip joint and blocking these nerves helps in hip analgesia. PENG block is commonly used in hip fracture pain perioperatively. In this case series, we have used PENG block in cancer patients with hip pain. PENG block was given to six patients with bupivacaine and triamcinolone, out of which five patients had good pain relief and their functional mobility to activities of daily living improved.

Keywords: Cancer-induced bone pain, Hip pain, Palliative care, Pericapsular nerve group block

INTRODUCTION

Cancer-induced bone pain (CIBP) is quite prevalent in some cancers like prostate in men and breast in women. Even though hip bone pain is very uncommon, it can be crippling with or without a pathological fracture. Hip pain can make a person immobile, which can result in infections, deep vein thrombosis, and a lower quality of life. The physical, psychological and socioeconomic toll on the caregiver may rise as a result. Guidelines from the European Society of Medical Oncology recommend medical therapy for CIBP.^[1] Pericapsular nerve group (PENG) block can provide good pain relief for pain around the hip joint. PENG block was started for intraoperative and postoperative analgesia in hip surgeries.^[2,3] The use of PENG block in cancer care is limited. Phenol was used for neurolysis with PENG block in terminally ill cancer patients.

In this case series, we report the use of PENG block in cancer patients with hip pain leading to decreased mobility. PENG block was performed ultrasound-guided single shot with bupivacaine and triamcinolone and one patient continuous perineural catheter placement was done.

CASE SERIES

Patients were seen in the pain and palliative medicine outpatient department (OPD). These patients were on opioids and other adjuvant pain medications which are described in [Table 1]. They were undergoing concurrent chemotherapy, radiotherapy and bisphosphonates as per the oncologist [Table 1]. They also had hip joint and proximal femur lytic skeletal metastasis along with hip pain which decreased their mobility. Most patients were not able to perform activities of daily living and were not even able to go to the washroom. Patients were counselled regarding the risk and benefits of the block. The risk of temporary weakness of the lower limb and fall was also explained. Patients were also informed regarding the duration of pain relief as it was a diagnostic block. Written consent was taken from all the patients after explaining the risks such as bleeding, motor blockade and the possibility of failure of the block. As all the patients were doing their daily activities like going to the washroom with severe pain and with the support of the caretakers with ongoing cancer treatment, bupivacaine and triamcinolone were administered instead of neurolysis.

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Table 1: Patient demography, procedure details and pain score.

Age/ Sex	Diagnosis	Symptoms	Relevant imaging findings	Pain score before the block (in hip Joint)	Procedure/ complications	Pain score after the block (in the hip joint)	Duration of pain relief	Pain medication
51 year/ male	Carcinoma kidney post -ephrectomy (received RT for 2 weeks)	Pain in the right hip, unable to ambulate due to pain	Fracture right inferior pubic	08/10	Right PENG block with catheter placement bolus dose 9 mL of 0.25% Bupivacaine with 40 mg (1 mL) of triamcinolone. The catheter was connected with Elastopump (Baxter) with 300 mL of 0.0625% of bupivacaine and a flow rate of 2 mL/h. Catheter removed after 5 days	03/10	1-month, later pain score was 5/10	Fentanyl 50 µg transdermal patch, gabapentin 400 mg OD, Nortriptyline 10 mg OD
57 year /male	Carcinoma prostate with skeletal metastasis Stage 4 With Type 2 diabetes mellitus, coronary artery disease post-bypass, chronic kidney disease (On chemotherapy)	Pain in the right groin		8/10	Right PENG block single dose 9 mL of 0.25% bupivacaine with 40 mg (1 mL) of triamcinolone	2–3/10	Pain relief lasted for 5 months had only mild pain in the groin and hip	Morphine 30 mg 6 th hourly, Gabapentin 400 mg OD, Nortriptyline 10 mg HS, Etoricoxib 60 mg OD
57 year female	Carcinoma left breast with skeletal metastasis (post- surgery, received chemotherapy and RT)	Pain in the right hip, lower back pain radiating to the thigh	A bone scan revealed increased tracer uptake in the proximal right femur	8/10	Right PENG block single dose 9 mL of 0.25% Bupivacaine with 40 mg (1 mL) of triamcinolone	3/10	4 months has only mild pain hip	Morphine 30 mg 6 th hourly, Tab Aceclofenac 100 mg BD, Tab Paracetamol 650 mg TID, T. Gabapentin 400 mg HS, Tab Nortriptyline 10 mg HS
54 year female	Carcinoma cervix with bone metastasis (Post- chemotherapy and RT)	Pain in the left hip, lower abdomen	Lytic lesion left iliac bone, adjacent to SI joint, inter- trochanteric region and proximal shaft of left femur	9/10	Left PENG block single dose 9 mL of 0.25% Bupivacaine with 40 mg (1 mL) of triamcinolone	2/10	After 5 months, a repeat block was performed	Morphine 5 mg 6 th hourly, Gabapentin 400 mg OD, Nortriptyline 10 mg HS, Etoricoxib 60 mg OD, Tab Paracetamol 650 mg TID

(Contd...)

Table 1: (Continued).

Age/ Sex	Diagnosis	Symptoms	Relevant imaging findings	Pain score before the block (in hip Joint)	Procedure/ complications	Pain score after the block (in the hip joint)	Duration of pain relief	Pain medication
65 year male	Carcinoma pancreas with skeletal metastasis (On chemotherapy and palliative RT)	Pain in the Left Hip, back, pelvic region	Sclerotic lesions in multiple vertebrae, bilateral iliac bone, right ischium, left femur	9/10	Left PENG block single dose 9 mL of 0.25% bupivacaine with 40 mg (1 mL) of triamcinolone	3/10	2 days	Fentanyl transdermal patch 50 µg/h, Tab Pregabalin 75 mg HS, Tab Paracetamol 650 mg TID
43 year female	Carcinoma left breast with skeletal metastasis (post-surgery, chemotherapy, RT)	Pain in the right hip		9/10	Right PENG block single dose 9 mL of 0.25% bupivacaine with 40 mg (1 mL) of triamcinolone	2/10	2 months	Tab morphine 10 mg 2 tablets 4 th hourly decreased to tab morphine 10 mg (1 tablet) 4 th hourly, Gabapentin 400 mg OD, Nortriptyline 10 mg HS, Etoricoxib 60 mg OD, Tab Paracetamol 650 mg TID

PENG: Pericapsular nerve group, RT: Radiotherapy

For one patient, a plan for catheter placement was done. The patient was admitted for analgesic titration and the procedure and the risk of infection were explained. In one of the patients, we repeated the PENG block after 5 months. Patients were interviewed telephonically and in the regular follow-up (weekly) in an outpatient clinic to know the duration of the pain relief. A numeric pain score (NRS) was used on a scale of 0–10.

Demographic information, diagnosis, relevant radiological information, pain score before and after the block, details of drugs used, catheter placement (yes/no), duration of the block and any complications encountered during the procedure were noted in a Microsoft Excel spreadsheet [Table 1] and the case file. The block with catheter placement was performed in the operation theatre in the supine position, with needle in-plane technique using linear probe 6–13 MHz of Sonosite Edge (FujiFilm Corp, US) ultrasound machine. A bolus of 9 mL of 0.25% bupivacaine (Sensorcaine, Zydus Healthcare Ltd, India) with 40 mg of triamcinolone (1 mL) (Kenacort, Abbott India Ltd, India) was given while performing the block with an 18 G Tuohy needle (B Braun®) and a 20 G

epidural catheter was threaded in the space between psoas tendon and pubic ramus. An elastomeric pump (Baxter®) was attached for continuous analgesia after filling it with 240 mL of 0.0625% (bupivacaine 0.5% 30 mL with 210 mL of normal saline) connected to the indwelling catheter with a continuous infusion at 2 mL/h. The patient was warned regarding lower limb weakness on the side of injection and signs and symptoms of local anaesthetic toxicity and was also educated. The catheter was removed on the 5th day. The patient did not have any complications for 5 days. The rest of the five patients were given 0.25% of bupivacaine 9 mL and 40 mg (1 mL) of Triamcinolone as a bolus dose single short injection with 20G Stimuplex Ultra 360 catheter (B Braun Germany) [Figure 1].

Patients were assessed for pain scoring with NRS within the first 30 min of the PENG block. Patients had good pain relief of the hip pain immediately after the block [Table 1]. Their functional mobility improves their quality of life. These five patients were telephonically interviewed by a pain and palliative medicine clinic nurse or seen in the Pain and Palliative Medicine OPD for follow-up.

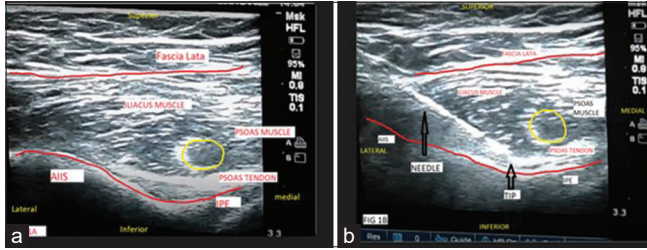


Figure 1: (a) sonoanatomy for pericapsular nerve group block (AIIIS: Anterior inferior iliac spine, IPE: Iliopubic eminence), (b) Direction and tip of the needle.

Four out of six patients had significant pain relief and mobility for more than 2–3 months, with two patients having mild hip pain for 5 months. One patient had pain relief for 2 days only. There was not much decrease in opioid medication post-procedure as these patients had pain due to multiple metastatic lesions.

DISCUSSION

Girón-Arango *et al.* described the PENG block as an ultrasound-guided regional anaesthesia method for treating hip fracture pain.^[2] PENG block has been utilised as a pain-relieving rescue block in the emergency room or for postoperative pain relief and ambulation.^[3] A PENG block was used to perform neurolysis on an older patient with metastatic epidermoid cancer who also had a pathological hip fracture, according to Romero *et al.*^[4] PENG block for hip surgery or hip fracture was mentioned in most case studies.^[3] Rarely, it has PENG block been used in cancer patients with hip joint metastases. From our experience, the use of PENG block with bupivacaine and triamcinolone in cancer patients with hip joint metastasis provided good pain relief and improved the quality of life. The use of an indwelling catheter was described with a low-volume bolus and infusion pump.^[5,6] We had placed a catheter in one patient at 2 mL/h for 5 days as the patient was admitted in the hospital for analgesic titration and was subsequently discharged on 2nd day. The patient had good pain relief and no untoward complications.

All the patients were ambulatory enough to go about their daily activities at home. One patient returned after 5 months for a second block. Ng *et al.* reported the use of alcohol chemical neurolysis for 20 patients with inoperable hip fractures, with three patients ambulating 4 months post-procedure.^[7] None of the patients in our experience had quadriceps weakness post-procedure. When a superficial local anaesthetic is injected and the needle is positioned

medial to the psoas tendon, Yu *et al.* report unintentional quadriceps blocks that occur after the block.^[8] When used to treat cancer patients who had hip pain and limited mobility, PENG block with bupivacaine and triamcinolone effectively relieved their pain, enhanced their quality of life and reduced the risks associated with protracted immobility.

CONCLUSION

US-guided PENG block is a safe, effective, and opioid-sparing intervention that can be offered to patients with hip pain due to advanced malignancy. The block can be performed as a single shot or as a continuous analgesia with an indwelling catheter. This case series demonstrated that patients who received PENG block not only had better analgesia but also had improved functional mobility.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Conflicts of interest

There are no conflicts of interest.

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