

SONO case series: an 85-year-old woman with left hip pain

CASE PRESENTATION

An 85-year-old woman presented with left hip pain after an unwitnessed mechanical fall. The patient was standing at home washing her face when her legs gave out and she landed onto her left hip. She was unable to stand after this accident and denies head strike or loss of consciousness. She was not on anticoagulation. When Emergency Medical Services arrived, the left leg was foreshortened and externally rotated. The paramedics administered 10 mg of intravenous morphine, but she was still writhing in pain on arrival. She presented with pain to the left hip, but with no weakness, numbness or paresthesias of the left lower extremity.

Medical history: Diabetes Mellitus, Hypertension and Chronic Kidney DiseaseK. Surgical history: none. Home medications: none. No allergies.

Triage vital signs: Blood pressure: 174/82 mm Hg, heart rate: 71 beats per minute, temperature: 36.7°C, respiration rate: 18 breaths per minute and SpO₂: 96%.

PHYSICAL EXAMINATION

Woman appearing frail and in pain. The head is atraumatic, but there is mild tenderness to palpation of the mid-cervical spine, c-collar is in place. Cardiac, pulmonary and abdominal examinations are normal. The left leg is foreshortened and externally rotated. There is severe tenderness to palpation of the left hip with limited range of MotionO due to pain. Circulation, sensation and movement are intact in the left leg.

The patient's pelvic X-ray is shown in [figure 1](#).

QUESTIONS

1. Why should we perform a fascia iliaca nerve block for hip fractures?

Multiple studies have shown decreased in-hospital mortality and complications when regional anaesthesia is performed. Specifically for hip fractures, fascia iliaca blocks led to a reduction of postoperative complications from 33% to 20%¹ along with decreased mortality, deep vein thromboses, altered mental status and pulmonary complications.² The National Institute for Health and Care Excellence clinical guidelines for the management of hip fractures recommend adding nerve blocks if paracetamol and opioids do not provide adequate analgesia and to limit opioid dosage.³

2. What is the goal of the fascia iliaca nerve block?

The goal of this nerve block is to maximise analgesia ([figure 2](#)), while minimising side effects such as respiratory depression, delirium, hypotension and nausea/vomiting that may be associated with intravenous opioid administration.⁴ The target of the anaesthetic injection is the potential space between the iliacus muscle and the fascia that overlies it (fascia iliaca), within which the femoral nerve and lateral femoral cutaneous nerve (LFCN) course. A large volume injection (40 mL) will lead to appropriate fascial spread and anaesthesia of the femoral nerve (88%), LFCN (90%) and sometimes the obturator nerve.⁵

3. When should I not perform a fascia iliaca nerve block?

Contraindications for this procedure include any anticoagulation besides aspirin and nonsteroidal anti-inflammatory drugs (relative contraindication), allergy to local anaesthetics, overlying cellulitis at the skin puncture site or ipsilateral fracture



Figure 1 Anterior-PosteriorA pelvic X-ray demonstrates a left femoral neck fracture (arrow).

at high risk of compartment syndrome, such as tibial plateau fractures.

4. What equipment is needed for this procedure?

Sterile supplies: ultrasound probe cover, gloves and Chloraprep wipe. To identify the anatomy: a bedside ultrasound with a high-frequency linear transducer. To instil the anaesthetic: lidocaine 1% (2–5 mL) for local weal of anaesthetic, local long-acting



Figure 2 Anaesthetic distribution of the fascia iliaca nerve block.

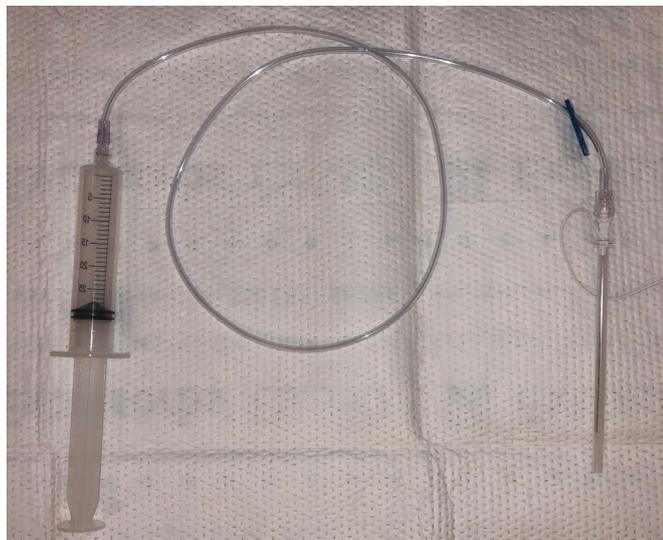


Figure 3 Syringe and nerve block needle setup for administration of anaesthetic agent.

anaesthetic (eg, 40 mL of 0.2% ropivacaine) for nerve block, sterile saline flush, 10 mL syringe, 60 mL syringe, extension tubing, 18 gauge needle, 25 gauge needle and 21 gauge nerve block needle (figure 3).

5. What are the anaesthetic medication options for this nerve block?

For a longer period of regional anaesthesia, we recommend ropivacaine, levobupivacaine or bupivacaine. Given the higher cardiac toxicity of bupivacaine due to its highly lipophilic nature compared with other local anaesthetics, we suggest 40 mL of 0.2% ropivacaine as the first-line agent.^{6,7} Lidocaine is not preferred given its shorter duration of action, which is contradictory to the goal of prolonged analgesia.

6. What is the technique used to perform a fascia iliaca nerve block?

Equipment positioning

Start by setting up an equipment stand on the same side of the bed as the patient's fracture, with the ultrasound machine on the contralateral side of the fracture. You will stand on the side of the fracture facing towards the head of the bed and looking across the patient's body at the ultrasound machine.

Sterile preparation

Wipe the ipsilateral inguinal area with the ChlorPrep and drape the area. Fill the 60 mL syringe with 40 mL of 0.2% ropivacaine. Attach the syringe to the extension tubing and nerve block needle. Remove air from the tubing and 'prime it' with the ropivacaine from the syringe. Place the sterile ultrasound probe cover on the probe.

Anatomy identification

Position the linear, high-frequency ultrasound probe held in horizontal orientation with the probe marker pointed towards the patient's right side (figure 4).⁴ Locate the femoral vessels ideally at the level of the common femoral artery and vein. Slide the probe laterally until you see the iliacus and sartorius muscles. The iliacus muscle will be in the same plane as the femoral vessels, and the sartorius will be superior and lateral (figure 5).

Instillation of anaesthetic agent

Using a 10 mL syringe and 25 gauge needle, deposit a small weal of local anaesthetic (eg, lidocaine) directly adjacent to the lateral surface of the ultrasound probe. Switch to the longer 21 gauge nerve block needle, which is affixed to an extension tubing

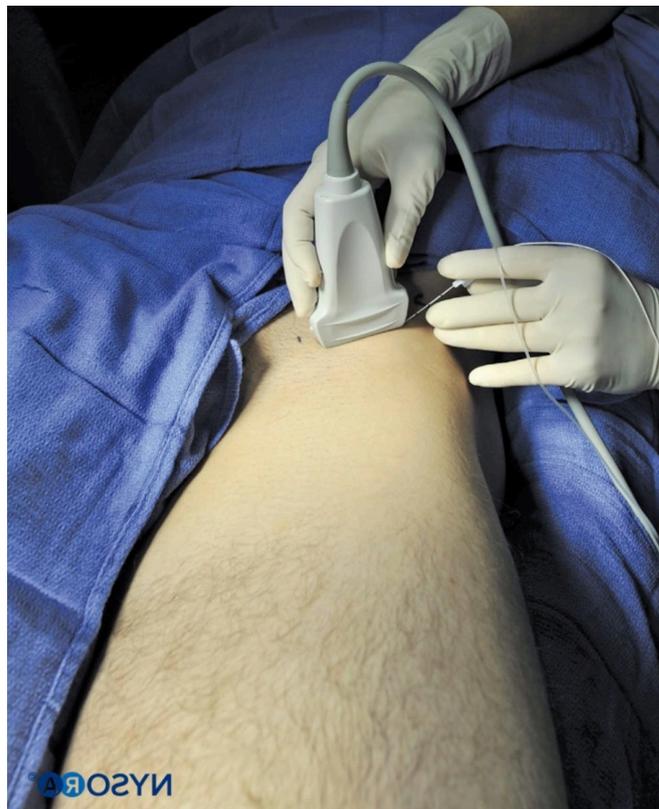


Figure 4 A patient's left anterior leg with the patient's head located towards the top at the photo. The ultrasound's linear probe is positioned horizontally at the level of the common femoral artery and vein.

and 60 mL ropivacaine-filled syringe (figure 3). The primary operator should be sterilely gowned and hold the nerve block needle, while a secondary operator should hold the ropivacaine syringe, being in charge of instilling the anaesthetic when needed.

Primary operator: Insert the nerve block needle at a steep 45°–60° angle through the weal and advance in plane lateral to medial through the subcutaneous tissue until you visualise the

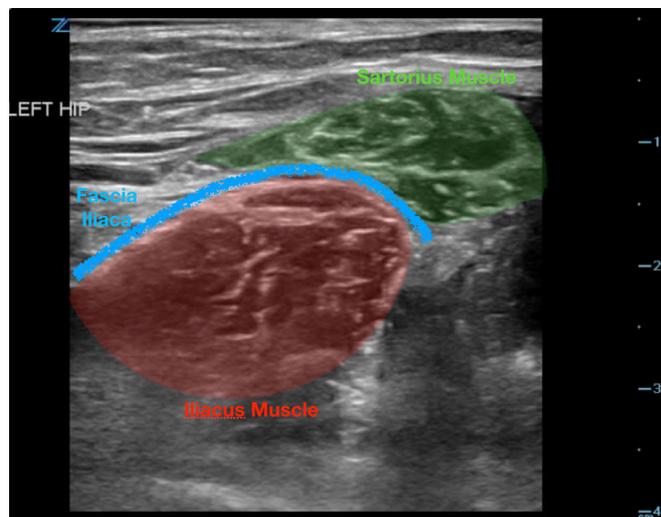


Figure 5 Ultrasound image identifying the iliacus muscle, fascia iliaca and sartorius muscle in a patient's left hip with the probe held just lateral to the femoral vessels. In this image, medial is towards the left of the screen and lateral is towards the right.

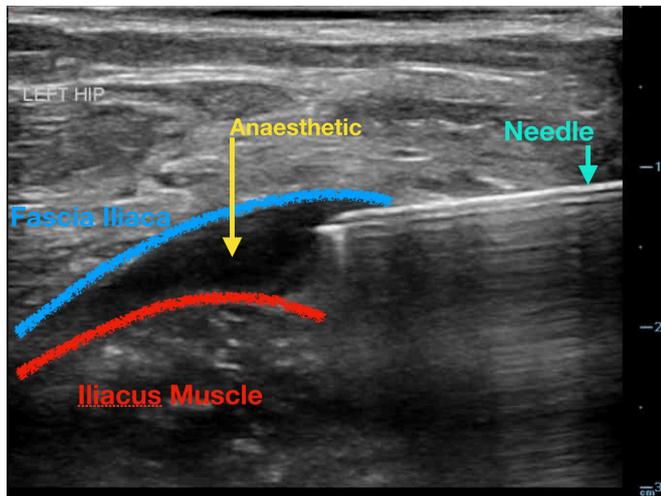


Figure 6 Ultrasound image showing the injection of the anaesthetic in between the fascia iliaca and the iliacus muscle.

tip of the needle underneath the fascia iliaca. You will likely feel pop or change in resistance as you pass through the fascia iliaca.

Secondary operator: Once the needle is appropriately positioned by the primary operator, inject a microaliquot of anaesthetic (0.5–1 mL) to see if the fascia iliaca appropriately dissects up and off the iliacus muscle. If the needle tip is placed inappropriately above (superficial to) the fascia iliaca in the subcutaneous tissue or too deep within the iliacus muscle, make in-plane adjustments of the needle tip and instil additional microaliquots until appropriate localisation is achieved. Once the needle is appropriately positioned, inject the entire volume of the 40 mL 0.2% ropivacaine (figure 6). Clear the ropivacaine remaining in the extension tubing with a few millilitres of the sterile saline flush after swapping the 60 mL syringe with a sterile saline flush. Adequate anaesthesia can take up to 30–60 min as the ropivacaine tracks upwards into the pelvis.

CONCLUSION

The patient had successful analgesia after the fascia iliaca nerve block and required no further intravenous opioid medications

before going to the operating room with the orthopaedic surgeons for a left hip hemiarthroplasty.

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