Fascia Iliaca Compartment Block (FICB) for paediatric femoral shaft fractures

Nerve blocks should be administered by trained personnel. This could include nurse practitioners or paramedics in addition to physician practitioners (9, 10).

Absolute contraindications:

- Parent refusal/uncooperative child
- Allergy to local anaesthetic
- Infection over the proposed injection site

Relative contra-indications

- Significant swelling around fracture site (risk of masking compartment syndrome)
- Known peripheral neuropathy in the affected limb
- Recent failed block (repeat blockade could be considered by an alternative operator provided cumulative safe anaesthetic dosage is not exceeded)

Anticoagulation (this is no longer an absolute contraindication, and with training and ultrasound guidance, nerve blocks can be considered for all anticoagulated patients) (11)

The aim of the FICB block is to introduce a high volume of local anaesthetic to spread into the potential space under the fascia iliaca. It targets the 3 nerves which run in this area. These are the femoral nerve, the lateral femoral cutaneous nerve and the obturator nerve. In the FI compartment block the obturator nerve is usually only partially blocked.

The needle is inserted laterally and the structures pierced during passage are skin, subcutaneous tissue, fascia lata and then fascia iliaca. The landmark technique has been called the “two pop” technique as loss of resistance is felt as the needle passes through the 2 fascial layers.

The ultrasound approach is safer and more accurate as it allows visual confirmation that local anaesthetic is delivered to the correct fascial plane.

The sonographic anatomy is shown in the later section on performing the block.

Equipment for the procedure:

- Sterile gloves
- Chlorhexidine for skin cleaning
- Sterile drape for skin
- Sterile ultrasound cover
- Sterile ultrasound jelly
- Appropriate sized syringes for calculated volume of 0.25% levobupivicaine
- 5ml syringe for local anaesthetic
- orange needle for SC skin infiltration of lignocaine
- 16 or 18 Ultrasound nerve block needle
- 2 x Drawing up needle (for drawing up local anaesthetic)
- 0.25% levobupivicaine for block (see below re drug dose)
- 1% lignocaine (0.5-1ml) for SC skin infiltration
- Dressing

An assistant may be required if a two-person injection technique is required.

This is a volume dependent block. The effect is provided by spread of the local anaesthetic below the fascial layer, washing around the three targeted nerves. As a result, a low concentration and high volume of local anaesthetic is required.

LOCAL ANAESTHETIC for Fascia Iliaca Block

0.25% Levobupivicaine 2mg/kg maximum dose (use estimated body weight as per APLS guidelines)

0.25% levobupivicaine contains 2.5mg/ml

CONSENT

Gain written informed consent from parent/carer by discussing the risks and benefits. Include the following risks:

- Block failure (20%)
- Nerve damage
- Bleeding
- Infection
- LA toxicity, including the early signs of toxicity so the patient can report them immediately (see later)

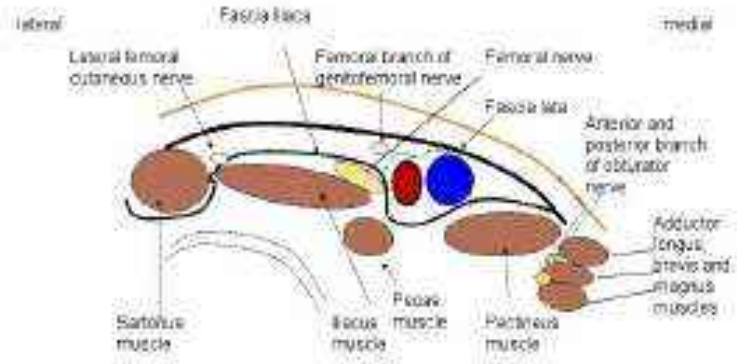
Talk them through the procedure and allow them to ask questions. Consent should be documented on the proforma.

TECHNIQUE

Position the patient flat on the bed (slight elevation of the head can be possible) with the leg slightly abducted and externally rotated (as pain allows).

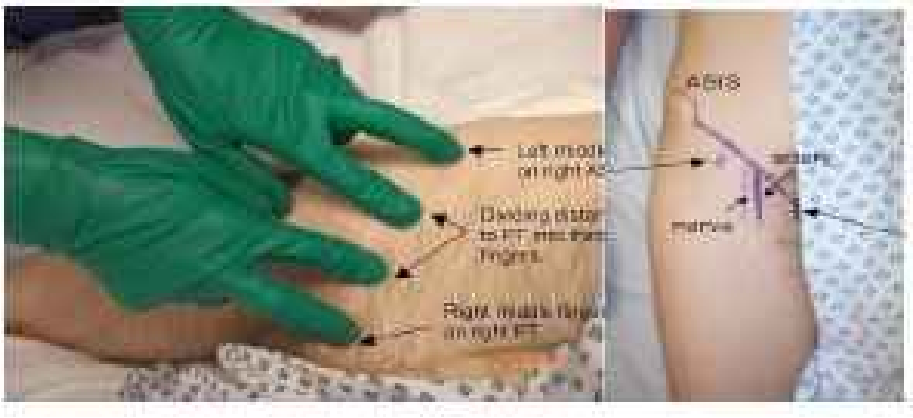
Ensure there is a working IV cannula and the patient is connected to a cardiac monitor

The block can be performed either by landmark technique or using USS guidance.



LANDMARK TECHNIQUE:

1. Identify site for the block, cleanse skin with an antiseptic solution and drape with a sterile towel. Raise skin wheal with small amount of 1% lignocaine (0.5-1ml)
2. The landmarks for FICB are the anterior superior iliac spine (ASIS) and the pubic tubercle on the same side. Place one middle finger on the ASIS and the other middle finger of the pubic tubercle. Draw a line between these two points. Divide this line into thirds. Mark the point 1cm caudal from the junction of the lateral and middle third. This is the needle entry point.



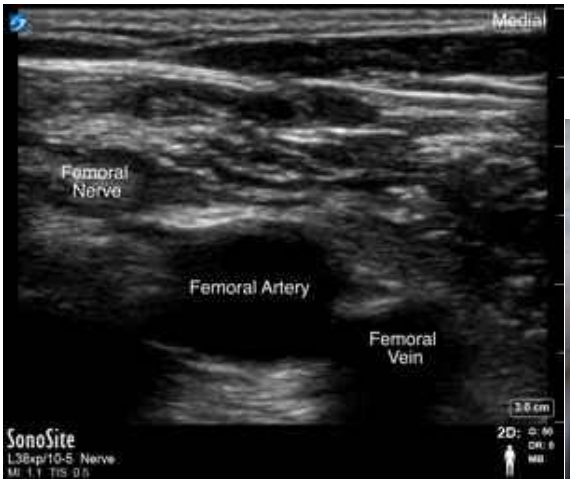
3. Palpate the ipsilateral femoral pulse at the level of your planned injections site. The pulse should be palpable 1.5 to 2 cm medial to the intended injection point to ensure a safe distance from the femoral nereve to avoid femoral nerve impalement.
4. Attach sideport of the hub of the Tuohy needle. Attach syringe filled with local anaesthetic solution. Prime tubing and needle with solution. Using Tuohy needle, pierce the skin at a right angle to its surface. Once thorough the skin adjust the needle angle to about 60 degrees directing the tip cranially.
5. Advance the needle through two distinct “pops” as it perforates first the fascia lata, then the fascia iliaca (the later gives a more subtle pop). Reduce the angle between the needle and skin surgace to about 30 degrees and advance the needle further 1-2mm
6. Aspirate before injection. If aspiration is negative, inject the levobupivicaine 0.25%. Pause after every 5mls and repeat aspiration. If aspiration is negative continue. There should be no resistance to injection. There should be no pain or paraesthesia on injection.

USS GUIDANCE TECHNIQUE:

Femoral artery identification and lateral scanning

Step 1:

With probe marker pointing towards ASIS (from the femoral artery and vein are identified. The nerve lies lateral to the artery. Probe depth should be set to 3cm, and a linear 5-11Hz probe selected.



Step 2:

The probe is moved lateral towards the ASIS, the iliacus muscle is identified with the fasia iliaca and fascia lata superiorly.

Fig. 50: Ultrasound-guided femoral block

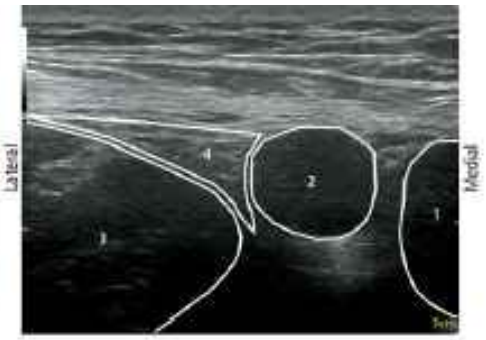


Fig. 51: Ultrasound image: ultrasonographic view of primary landmarks

1 Femoral vein
2 Femoral artery
3 Iliopsoas muscle
4 Femoral nerve

Step 3:

The needle is inserted and visualised in plane. A pop may be felt as it passes through the fascia lata and fascia iliaca. The needle should be placed under the fascia iliaca and the fascia hydro-dissected from the ilacus muscle.

The procedure can also be performed out of plane. The needle should be inserted as per the landmark technique and the needletip "chased" to be visualised entering the fascia iliac compartment.

The syringe should be aspirated prior to infiltration, and then a test dose of 1-2mls injected to confirm position. The probe can scan medially to confirm spread towards the femoral nerve.

(Local anaesthetic spread shown in blue.)

There should be no resistance to injection. The residual volume of the local anaesthetic can then be infiltrated. Ensure negative aspiration after every 5mls of local anaesthetic injected.

After infecting, carefully withdraw the needle, apply pressure for 30secs, then a dry dressing to the injection site.

Step 4:

Continue monitoring for 30mins

Document procedure on the proforma and ensure the levobupivicaine 0.25% is prescribed on the cascard.