

Nerve blocks in the CED

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Publication date: June 2015
Review date: June 2017

See also: *Oxford Handbook of Emergency Medicine 4th edition pp 294-306*
[Local anaesthetic toxicity guideline](#)

Background

- Nerve blocks should only be undertaken by Clinicians who are trained to do so.
- Never use lignocaine with adrenaline on digits.

Lignocaine 1% is used routinely for nerve blocks, with the exception of the femoral nerve block. Maximum lignocaine dose = 3mg/kg (0.3 ml/kg of 1% lignocaine). Effects last 30 – 60 minutes, with rapid onset. Buffering the lignocaine with sodium bicarbonate 8.4% (1ml to 10ml 1% lignocaine) can reduce pain with injection.

Bupivacaine and levobupivacaine is used for femoral nerve blocks. It is a longer acting local anaesthetic (LA) with effects lasting 3 – 8 hours, but takes longer to work than lignocaine.

Local anaesthetic toxicity occurs from inadvertent intravascular injection or overdose of LA. Initial symptoms include numbness / tingling around the mouth or tongue, dizziness, and slurred speech, progressing to confusion, convulsions, coma and cardiac arrest. Ensure availability of resuscitation equipment and treat complications as they arise. In severe cases of LA toxicity, an Intralipid infusion will be required. This is available in the CED drug room.

DIGITAL NERVE BLOCK (“ring block”)

Provides anaesthesia to individual fingers for procedures such as nail bed repair, reduction of fractures and dislocations, and suturing.

Assessment

- Dorsal and palmar digital nerves run along each side of the finger and thumb, and in the toes.
- The palmar nerves run with the digital vessels on either side of the flexor tendon sheath of each digit, and supply sensation to the lateral and palmar aspect of each finger together with the tip and nail bed area.
- The smaller dorsal digital nerves run on the dorsolateral aspect of each finger and supply sensation to the back of the finger.

Management

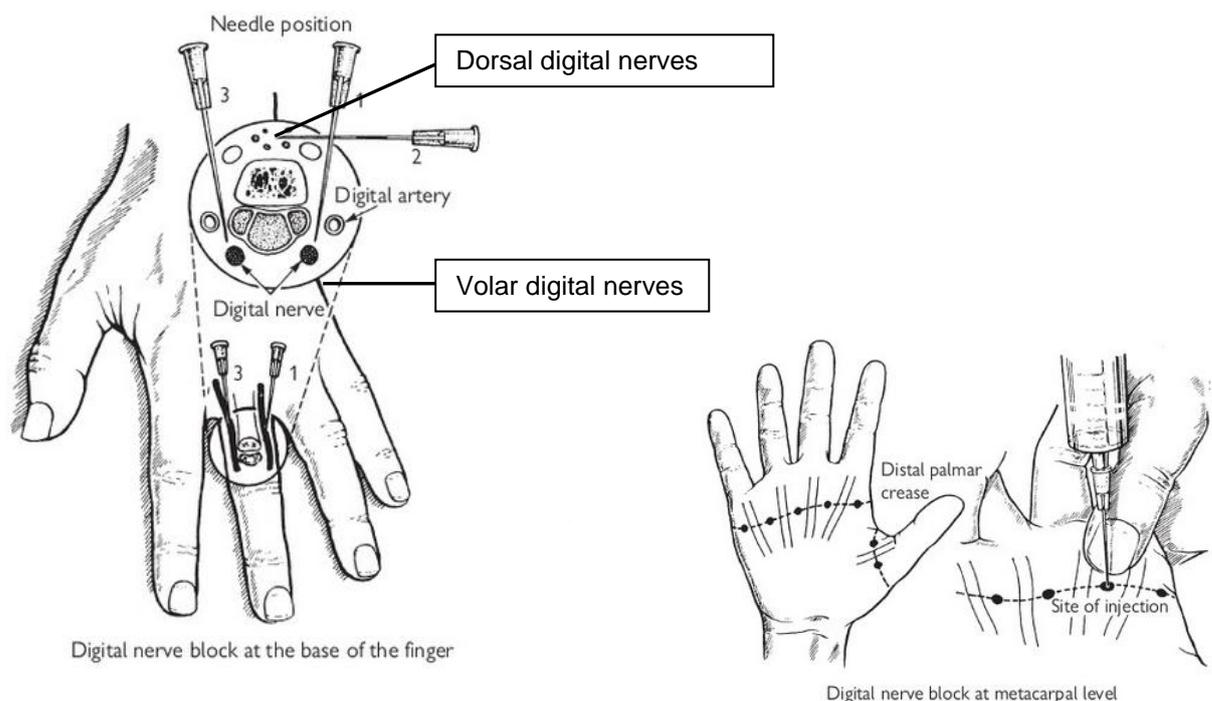
Use 1% lignocaine to a maximum dose of up to 5ml (less in younger child). Practically, a maximum of 1 – 2 ml can be instilled on either side of the digit (less in younger child).

Use a sterile technique. Consider use of Entonox for additional analgesia as digital nerve blocks are very painful.

1. Place child's hand palm down and clean the skin with chlorhexidine wash.
2. Use a blue (25G) needle with a 5 ml syringe containing lignocaine.
3. Insert into the dorsal aspect of the base of the digit, as proximally as possible, and close to the phalanx.
4. Angle inwards towards the midline of the digit, advancing the needle until just below the skin on the palmar side.
5. Aspirate to ensure you have not entered a vessel.
6. Slowly inject 0.5 – 1 ml and continue to inject as the needle is withdrawn.
7. Repeat on the opposite side of the digit.

If anaesthesia is needed for the nail bed of the big toe, or for anaesthesia of the dorsum of the digit proximal to the middle phalanx, give an additional injection subcutaneously across the dorsum of the base of the digit, to block the dorsal digital nerves.

Anaesthesia should develop after 5 minutes. The skin will feel dry and warm as autonomic fibres are blocked as well as the sensory fibres.



Nerve blocks can also be given at the metacarpal level, providing anaesthesia to more proximal parts of the digit such as the MCP joint.

The needle is inserted in the palm through the distal palmar crease, between the flexor tendons of adjacent fingers.

A dorsal approach is also possible between the MCP joints, but there is a greater risk of inadvertent venepuncture and a deep injection is needed to reach the digital nerves.

FEMORAL NERVE BLOCK

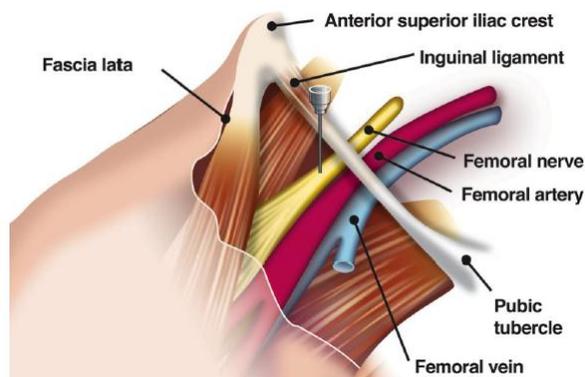
Provides analgesia for pain from a femoral fracture, whilst not a substitute for intravenous analgesia, it allows for more comfortable movement and application of traction.

Femoral nerve blocks should only be performed with ultrasound guidance. The blind technique is no longer recommended.

The aim of a femoral nerve block is to inject LA around the nerve, not into the nerve.

Assessment

- The femoral nerve passes under the inguinal ligament, where it lies 1-2 cm lateral to the femoral artery (mnemonic “NAVY” – nerve, artery, vein, Y-fronts).
- It supplies the hip and knee joints, the skin of the medial and anterior aspects of the thigh, and the muscles in the anterior compartment of the thigh.
- The nerve may not be visualised on ultrasound, but lies within a triangle formed medially by the artery, anteriorly by the fascia iliaca, and posteriorly by the iliopsoas muscle.

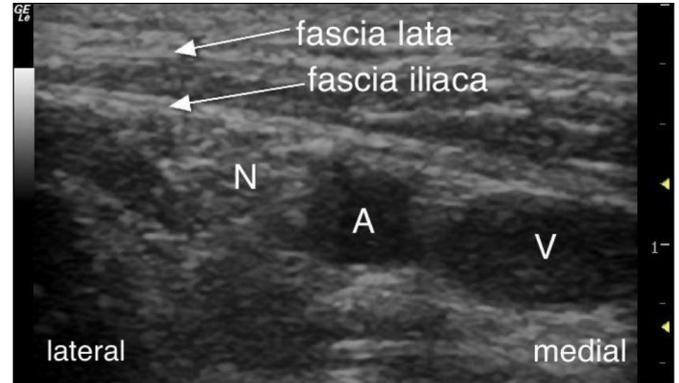
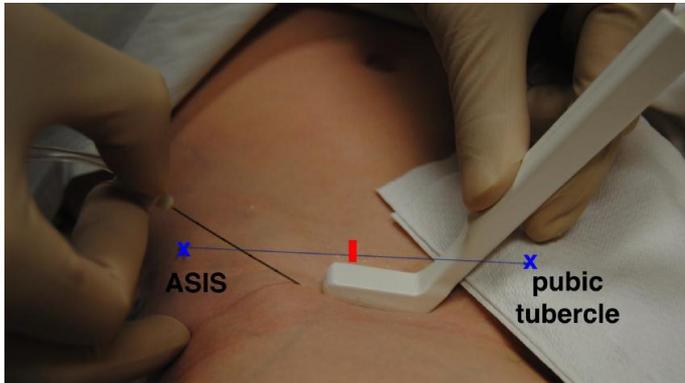


Management

Use 0.5% Bupivacaine (5mg/ml) without adrenaline. Maximum dose is 0.4 ml/kg. Use a sterile technique. In older children, consider use of Entonox for additional analgesia during procedure.

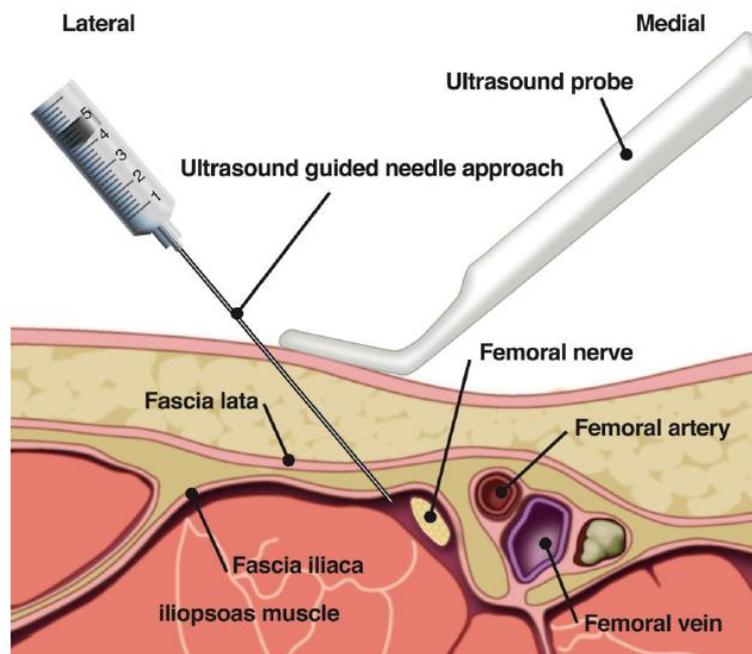
1. Place child in supine position, if possible with leg slightly externally rotated.
2. Clean area with chlorhexidine wash.

3. Use a linear ultrasound probe and ensure the probe has a sterile covering.
4. Place the ultrasound probe in the inguinal crease in a transverse position over the femoral artery (parallel to the inguinal ligament), with the indicator facing laterally.
5. Tilting the probe towards the head or the feet can help to show up the nerve.



6. Insert the needle with attached syringe containing bupivacaine at the lateral edge of the probe, aiming medially, and as shallow as possible.
7. Needle size will depend on size of child, but at least blue (25G).
8. Ensure you visualise the needle tip on ultrasound. Once through the fascia (you may feel a “pop”), aspirate to ensure you have not entered a vessel.
9. Correct needle tip placement is either above, below or lateral to the nerve. Slowly inject the required volume of bupivacaine into the space. You should see the nerve lift off the iliopsoas muscle.
10. If the patient complains of pain shooting down the leg, or resistance to injection is felt, withdraw needle to avoid injection into the nerve.

The block should take about 15-30 minutes to work.



References

1. http://www.sonoguide.com/femoral_nerve_block.html. Accessed 4 June 2015.
2. <http://www.nysora.com/techniques/3120-ultrasound-guided-femoral-nerve-block.html>. Accessed 4 June 2015.
3. <https://www.apls.org.au/sites/default/files/uploadedfiles/Peripheral%20Nerve%20Blocks%20-%20Elizabeth%20Prentice.pdf>. Accessed 4 June 2015.
4. Wyatt JP, Illingworth RN, Graham CA, Hogg K. 2012. *Oxford Handbook of Emergency Medicine*. 4th edition. Oxford: Oxford University Press.