

ULTRASOUND GUIDED FASCIA ILIACA COMPARTMENT BLOCK (FICB)

PEARLS and various techniques on how to perform FICB. Tips and important points.

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FASCIA ILIACA COMPARTMENTAL BLOCK (FICB)

In principle, FICB is an **extension of the femoral nerve block,** in which **the differentiating factor is the VOLUME** of local anaesthetic used, causing extension of block to the lateral femoral cutaneous nerve (LFCN)/lateral cutaneous nerve of the thigh (LCNT) and/or the obturator nerves. Previously described as 'the 3-in-1 block' in technique. Instead of 20 ml for block of the femoral nerve, **up to 40 ml of half maximum strength of local anaesthetic is used.** (*FICB is only performed as an analgesic modality*)

.... IMPORTANT POINT #1

Two approaches/Techniques for Ultrasound Guided FICB:

- A) Infra-inguinal Lateral to Medial Approach
- *B)* Supra-inguinal Caudo-Cephalad Approach
- A. *Infra-inguinal Lateral to Medial Approach* is the same as femoral nerve block in technique, with the difference being:
 - i) A larger volume is administered (40 ml) v 20 ml for femoral nerve block. (The classical '3in-1 block' description)

... AND ...

ii) **Need to ensure <u>LATERAL SPREAD</u>** along the anterior border of Iliacus muscle going posterior to the Sartorius muscle laterally. Needle position is adjusted to ensure this is achieved.

(Refer to Figures 1 to 4)

.... IMPORTANT POINT # 2

B. **Supra-inguinal Caudo-Cephalad Approach is** *essentially the ANATOMICAL LANDMARK TECHNIQUE* of performing FICB.

Two techniques can be utilized to identify this plane with ultrasound

- a) Dual-View Iliacus Plane Technique
- b) Direct Longitudinal Axis Technique

For Supra-inguinal technique, there is a need to *ensure that;* <u>PROXIMAL SPREAD</u> beneath Fascia Iliaca is achieved, LA spread goes beyond the anterior inferior iliac spine (AIIS) AND deep towards the retro-peritoneal structures. (Refer to Figure 5)

.... IMPORTANT POINT #3



Figure 1: Infra-inguinal Lateral to Medial FICB Approach;

View of the femoral nerve lateral to the artery. Same technique as femoral nerve block (see text). Here the femoral nerve is bathed in local anaesthetics. Note the thin layer of LA spreading laterally. (indicated by the arrow)



Figure 2: Infra-inguinal Lateral to Medial FICB Approach;

An alternative approach would be to 'pop' fascia iliaca (yellow arrows) at a more lateral point over the sartorius muscle. Local anaesthetic is then administered below the fascia and above the muscle, ensuring medial spread towards the femoral nerve.



Figure 3: Infra-inguinal Lateral to Medial FICB Approach;

Needle is re-directed with local anaesthetic delivery to dissect between fascia and muscle. Hypoechoic local anaesthetic is seen underneath the fascia (which is highlighted by the yellow arrows)



Figure 4: Infra-inguinal Lateral to Medial FICB Approach; Further spatial distension is highlighted within fascia iliaca compartment.



Figure 5: Supra-inguinal Caudo-Cephalad FICB Approach;

View of fascia iliaca illustrated along its caudo-cephalic axis (from left to right - as shown by the arrow). Local anaesthetics should be deposited below this fascia spreading proximally into the pelvis towards the retro-peritoneal structures.

IMPORTANT POINT #4;

- a) Dual-View Iliacus Plane technique
- A **femoral nerve block view is acquired at the 'snowman point'** This is where the femoral nerve is at its most superficial and accessible point along its course to be blocked.
- A high frequency linear transducer is then aligned laterally, away from the femoral nerve, until a point where the iliacus muscle is the superficial-most muscle, and is at the centre of the screen. (In some patients, the Sartorius muscle is seen above the Iliacus. If this is the case, move the transducer further proximal towards the inguinal ligament until the Sartorius muscle is not seen) ... (Refer to *Figure 6*)
- Mark this central point next to the transducer, as if an out-of-plane needle insertion technique is to be attempted (with your finger- as the needle marker) (Refer to Figure 7)
- With the out-of-plane needle marker (finger) still in place, the transducer is then rotated 90° with the cephalad end directed towards the spine in a slight superior-medial to inferior-lateral orientation, to visualize the iliacus muscle in its longitudinal axis. The needle marker now is IN-PLANE to the transducer and would be the point of needle insertion (and the direction of the block needle.) ... (Refer to *Figure 8*)

IMPORTANT POINT #5

- This technique is to confirm in dual view (- by making the iliacus muscle superficial-most) that the muscle identified IS the iliacus and its overlying fascia iliaca and <u>NOT</u> fascia of the Sartorius muscle, which is in close proximity. (These 2 muscles can be seen in close association if a 'Bow-tie sign' technique is used and fascia lata, which is above the Sartorius muscle, may be mistaken as fascia iliaca if the muscle planes are not clearly delineated. If a 'Bow-tie sign' technique is used, fascia iliaca is seen at its more lateral location and it should be in a plane deep to the Sartorius)
- A block needle is then introduced **IN-PLANE** to the transducer **(the finger point)** and 40ml of diluted local anaesthetic is administered as analgesia.



Figure 6: Dual-View Iliacus Plane technique for identifying iliacus muscle with its overlying fascia iliaca; With the patient supine (femoral block- Snowman point) position, align transducer proximally and laterally until iliacus is the superficial-most muscle at the centre of the screen.



Figure 7: Dual-View Iliacus Plane technique for identifying iliacus muscle with its overlying fascia iliaca; Mark this central point as if an out-of-needle plane needle insertion is attempted.



Figure 8: Dual-View Iliacus Plane technique for identifying iliacus muscle with its overlying fascia iliaca;
Rotate transducer 90⁰ while keeping 'needle marker' in-plane to the transducer to produce image in Figure 9.

IMPORTANT POINT #6

b) Direct Longitudinal Axis Technique

- Position the patient in a **femoral block technique position and identify the Anterior Superior Iliac Spine (ASIS) laterally.** ... (Refer to Figure 9)
- Place your index finger immediately medial to the ASIS and align a high frequency linear transducer immediately next to this finger, with the caudad end of the transducer just above the inguinal ligament. The alignment of the transducer should be superior-medial to inferior-lateral from cranial to caudal. ... (Refer to Figure 10 and Figure 11)
- Alignment of the transducer is adjusted along this plane to view the Anterior Inferior Iliac Spine (AIIS) forming a 'ridge' deep in the pelvis with the overlying iliacus muscle running caudally across this ridge into the thigh. At this point around the inguinal ligament, the iliacus muscle is (almost) at its most superficial. (At roughly at a distance between one finger-breadth medial to ASIS and lateral to the mid-point of the inguinal ligament- the 'safe area') ... (Figure 12)

If the needle entry point is 'too medial', the is a potential risk of arterial puncture and if the needle is 'not lateral enough', there is a risk of potential direct femoral nerve impalement.

... IMPORTANT POINT #7

- A block needle is then introduced (within this 'safe area') IN-PLANE to the transducer and 40ml of diluted local anaesthetic is administered as analgesia.



Figure 9: Direct Longitudinal Axis technique for identifying iliacus muscle with its overlying fascia iliaca; With the patient in femoral block position, identify the ASIS laterally.

Figure 10: Direct Longitudinal Axis technique for identifying iliacus muscle with its overlying fascia iliaca; Index finger is placed immediately medial to ASIS.

Figure 11: Direct Longitudinal Axis technique for identifying iliacus muscle and its overlying fascia iliaca; Placement and orientation of high frequency linear transducer one finger-breadth medial to the ASIS.







Figure 12 showing ideal sono-anatomical view for FICB.

Important landmarks identified i) **AIIS** - Anterior Inferior Iliac Spine; and ii) overlying Iliacus muscle and Fascia Iliaca iii) **DCIA** - Deep Circumflex Iliac Artery



Figure 13: Identification of Fascia Iliaca;

At times when identification of the fascia is difficult, look for differentiation in echo-textures between the borders of the muscle-to-soft tissue planes between iliacus muscle and the retroperitoneal connective tissues. (yellow arrow)



Figure 14: Note local anaesthetic (LA) spread proximal into pelvis as the needle is being advanced in caudo-cephalad direction. Note the expansion in spread after LA deposition proximally and behind reflected parietal peritoneum. (Blue arrow)

IMPORTANT POINT #8;

CONCENTRATION AND DOSES

Instead of 20 ml for block of the femoral nerve, **up to 40 ml of half maximum strength local anaesthetic (**0.375% ropivacaine or 0.25% levo-bupivacaine) is used. (FICB is performed as part of multi-modal analgesia and NOT anaesthesia)

Onset should be within 20 minutes with duration of action of up to 12-18 hours.

There may be some motor involvement of the femoral nerve due to close proximity of LA deposition. (Duration of action of a motor block with this strength of LA would be approximately less than 6-12 hours.)

SUMMARY

IMPORTANT POINT #1;

Two approaches/Techniques for Ultrasound Guided FICB:

- Infra-inguinal Lateral to Medial Approach;
- Supra-inguinal Caudo-Cephalad Approach.

IMPORTANT POINT #2

Infra-inguinal Lateral to Medial Approach is similar as a femoral nerve block in technique

IMPORTANT POINT #3

Supra-inguinal Caudo-Cephalad Approach is *essentially* the ANATOMICAL LANDMARK TECHNIQUE of performing FICB.

Two techniques can be utilized to identify this plane with ultrasound;

- Dual-View Iliacus Plane Technique;
- Direct Longitudinal Axis Technique

IMPORTANT POINT #4

Dual-View Iliacus Plane uses SNOWMAN POINT as landmark

IMPORTANT POINT #5

Highlight the difference between **Dual-View Iliacus Plane** technique v 'Bow-tie sign'

IMPORTANT POINT #6

Direct longitudinal Axis Technique uses ASIS as landmark

IMPORTANT POINT #7

Point of injection must be in 'safe area'- medial to ASIS and lateral to mid inguinal point

IMPORTANT POINT #8

FICB is for analgesia with usual volume of 30-40 ml