Lumbar and Sacral Plexus Blocks

Dr Shiv Kumar Singh
Lumbar Plexus

Upper and lower divisions

L1

Ilioinguinal nerve

Iliohypogastric nerve

Genitofemoral nerve

Lat cut n. of thigh

L2

L3

L4

Femoral nerve
Lumbar Plexus

Upper and lower divisions

$L_1$
Iliohypogastric nerve

$L_2$
Genito-femoral nerve

$L_3$
Ilioinguinal nerve

$L_4$
Obturator nerve

Lat cut n. of thigh

Femoral nerve

Branch to lumbosacral trunk
Winnie’s approach

TUFFIER’S LINE

PSIS

SPINOUS PROCESSES
Winnie’s approach

TUFFIER’S LINE

PSIS

Spine

L3

L4

L5
Chayen’s approach

TUFFIER’S LINE

PSIS

Spine
L₃
L₄
L₅

4cms
Winnie’s and Chayen’s approach

- Winnie’s approach: Point of puncture overly lateral, > chances of missing the Lumbar Plexus, failure rates too high.

- Chayen’s paravertebral approach: Overly medial, excessive number of peridural anaesthesia
Capdevila’s approach
Anesth analg 2002;94:1606–13

Continuous Psoas Compartment Block for Postoperative Analgesia After Total Hip Arthroplasty: New Landmarks, Technical Guidelines, and Clinical Evaluation Xavier Capdevila, MD, PhD, Philippe Macaire, MD, Christophe Dadure, MD, Olivier Choquet, MD, Philippe Biboulet, MD, Yves Ryckwaert, MD, and Françoise d’Athis, MD
Capdevila’s approach

TUFFIER’S LINE

Spine

L3  L4  L5

1/3

PSIS

2/3

Hit the transverse process and walk off it by 18-20mm to stimulate roots of femoral nerve
Another approach

Spine

L₃ L₄ L₅

PSIS

1/3 2/3
Lumbar Plexus

Winnie’s approach, overly lateral

Lumbar Plexus
The Approach I use and teach!!!
Capdevila’s approach

TUFFIER’S LINE

PSIS

Spine

L₃  L₄  L₅

1/3

2/3

Hit the transverse process and walk off it by 18-20mm to stimulate roots of femoral nerve.
Lumbar Plexus Block

1. Patient on lateral side
2. Mark the spinous process and draw a line through them (Line 1)
3. Feel the PSIS and draw a line from it going cranially (Line 2), parallel to Line 1
4. Draw the Tuffier’s line (Line 3) cutting the line 1 and 2
5. Mark the point of transection, medial 2/3 and lateral 1/3 (between Line 1 and 2)
Lumbar plexus block

• Use 100mm Stimuplex Needle and insert it absolutely perpendicular to the skin.

• Insert it till it touches the transverse process of L₄. The tip of needle should lie on the cranial or caudal edge of the transverse process (not the centre). Usually 5-7 cms in most normal size patients.
Lumbar plexus block

• Distance from skin to transverse process differs depending on size of the patient but from there to nerve roots, it is 18-20mm

• Walk off the transverse cranially or caudally (do not angle the needle too much, you should glide off at angle of 10-15°) by approx 2.0cms, till you see twitching of quadriceps. Drop the current from 1.5mA to 0.5 mA
When do we fail to find the LPB

- Too lateral, revisit your landmarks

- Point of insertion not on the edge of the transverse process, walking off at a greater angle

- Wrong landmarks, some patient have very high iliac crest. Move the point caudally. Count your spine from caudal to cranial direction
Cranial

Caudal

Hitting the transverse process on the edge

Hitting the transverse process in the middle and walking off it misses the nerve root

Ant

Cranial

Post

Hitting the transverse process on the edge

Hitting the transverse process in the middle and walking off it misses the nerve root
Mansour’s approach
Mansour’s parasacral approach

1. Patient in lateral position
2. Mark the PSIS and the Ischeal Tuberosity
3. Draw a line joining these points
4. Mark a point 6 cms from the PSIS caudally, this is the point of needle insertion
5. It is also sometimes useful to mark other landmarks for sciatic nerve.
Real Sacral Plexus Block

• The point is at the junction of cranial 1/3 and caudal 2/3\(^{rd}\) Junction

• This has been tested on CT studies

• This is the point I use for my blocks
Approaches to the Sciatic nerve

Labat’s approach

Raj’s approach

GT

PSIS

Sacral Hiatus

IT

TIP OF COCCYX
Parasacral approach

• If the original point of insertion fails, point the needle towards the Raj’s approach to sciatic nerve at around 45-60° angle to the point of insertion.

• Completes the anaesthesia for the arthroplasties of the hip by blocking the sciatic nerve and the nerves to the gluteal muscles.
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