



28th Annual Gabor Racz Advanced Interventional
Pain Conference and Workshop
Budapest, Hungary August 25-27, 2025

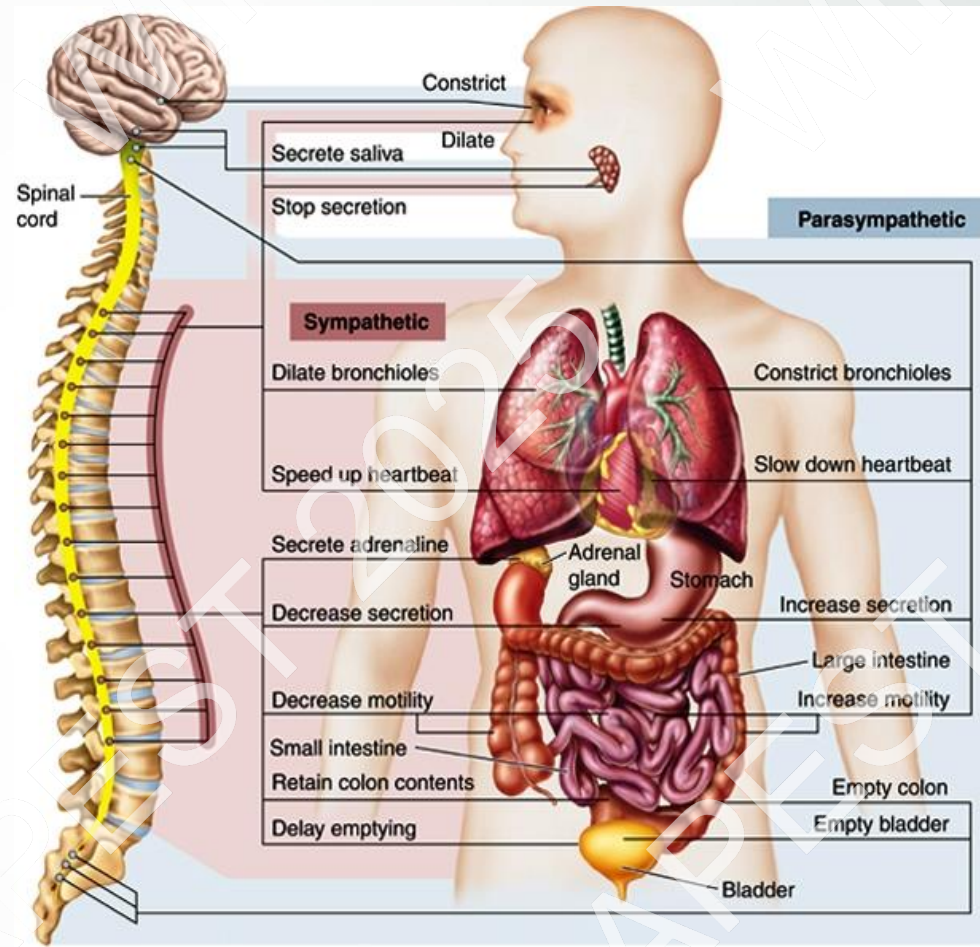


Lumbar Sympathetic & Superior Hypogastric Blocks

Bolkar E. Sahinler,

Overview & Objectives

- Understand anatomy of lumbar sympathetic chain and superior hypogastric plexus
- Review indications and contraindications
- Learn techniques for both blocks
- Discuss outcomes and complications





Overview of Sympathetic Nervous System

- **Function:** The SNS is part of the autonomic nervous system, controlling involuntary functions—vascular tone, sweating, and visceral organ activity.
- **Pathway:** Preganglionic fibers exit the spinal cord from **T10–L2** levels for the lower extremities and pelvis.
- **Ganglia & Plexuses:**
 - **Lumbar sympathetic chain:** Runs along anterolateral vertebral bodies (L2–L4), controlling vasoconstriction, sweating, and nociceptive modulation in the legs.
 - **Superior hypogastric plexus:** Located anterior to L5–S1, relays pain from pelvic viscera (bladder, uterus, prostate, rectum).



Lumbar Sympathetic Chain Anatomy

Location and structure

- **Position:** The lumbar sympathetic chain lies **anterolateral to the lumbar vertebral bodies**, within the retroperitoneal space.
- **Number of Ganglia:**
- Typically **2 to 4 lumbar ganglia** (most commonly at L2–L4 levels).
- Ganglia are small, fusiform swellings along the chain.
- **Relation to Vertebrae:**
- Lies on the **anterolateral aspect of vertebral bodies** and intervertebral discs.
- Covered anteriorly by the **psoas major muscle**.
- **Laterality:** Right and left chains run parallel to the aorta (left) and inferior vena cava (right).

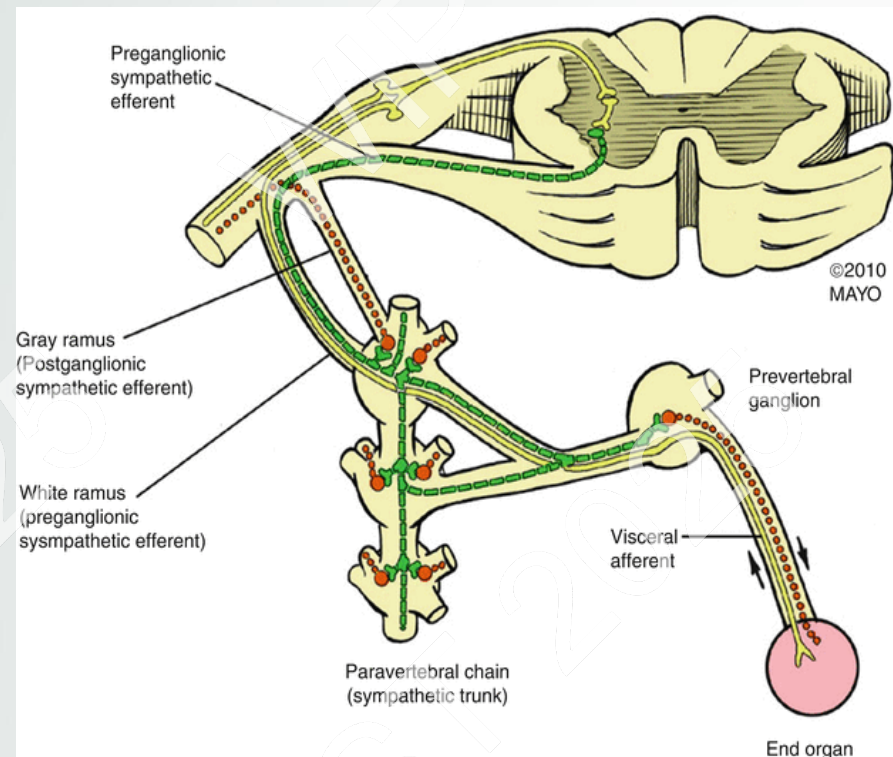
Connections

- **Preganglionic fibers:** Originate from intermediolateral cell columns in **T10–L2** spinal cord segments → exit via white rami communicantes.
- **Postganglionic fibers:** Travel to lower extremities, pelvic viscera, and blood vessels.
- **Rami communicantes:**
- **White rami:** Preganglionic input from spinal nerves.
- **Gray rami:** Postganglionic fibers back to spinal nerves.

Surrounding Structures

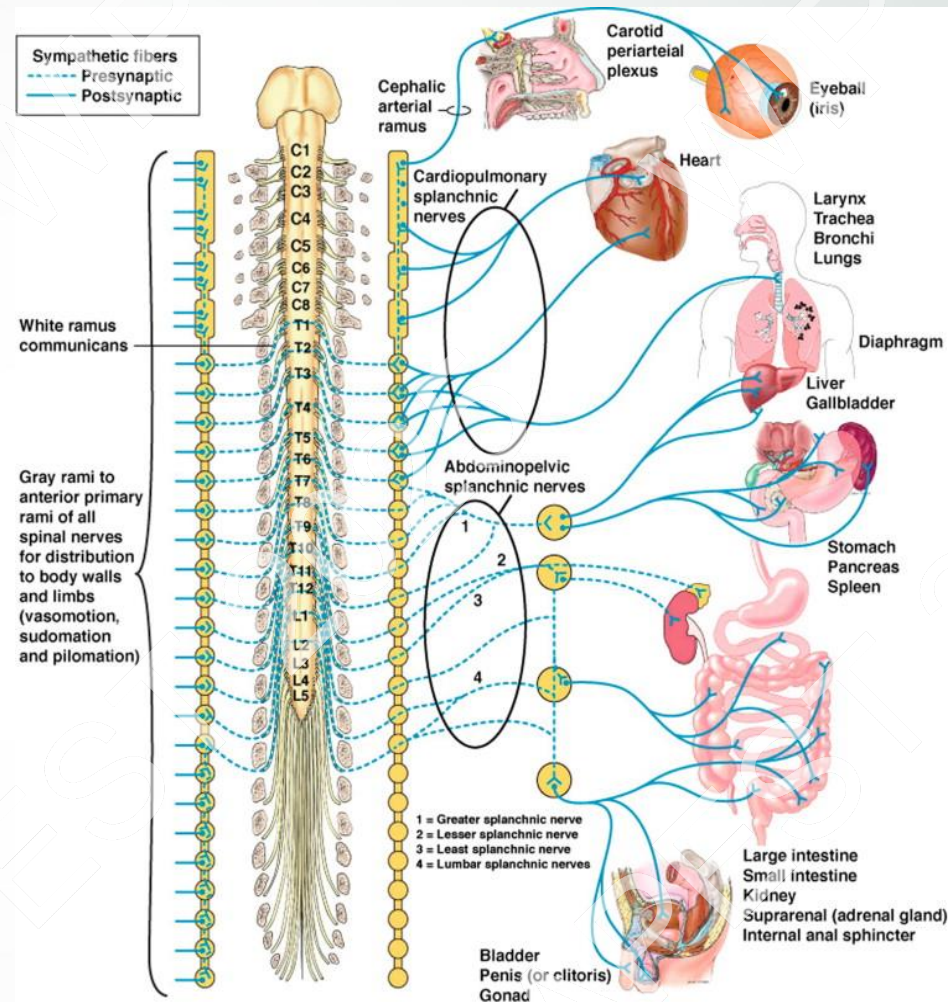
- **Anterior:** Psoas muscle, retroperitoneal fat, ureter (laterally).
- **Medial:** Aorta (left), IVC (right).
- **Posterior:** Vertebral bodies, discs.
- **Superior limit:** Continuation of thoracic sympathetic chain at T12–L1 junction.
- **Inferior limit:** Merges with sacral sympathetic chain at L5–S1.

Anatomy

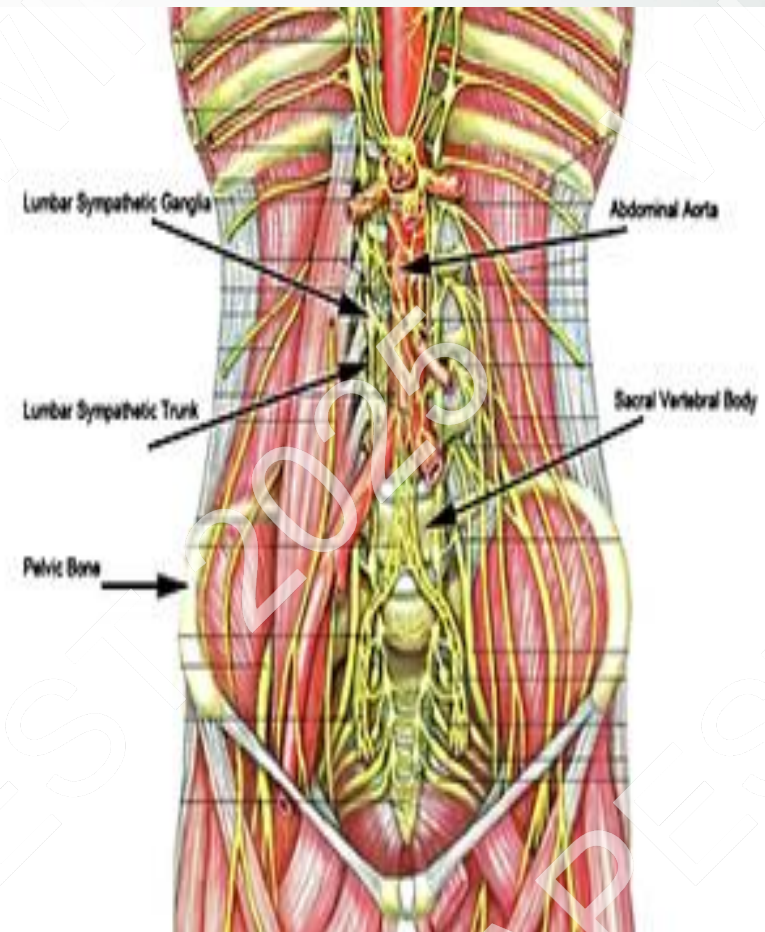
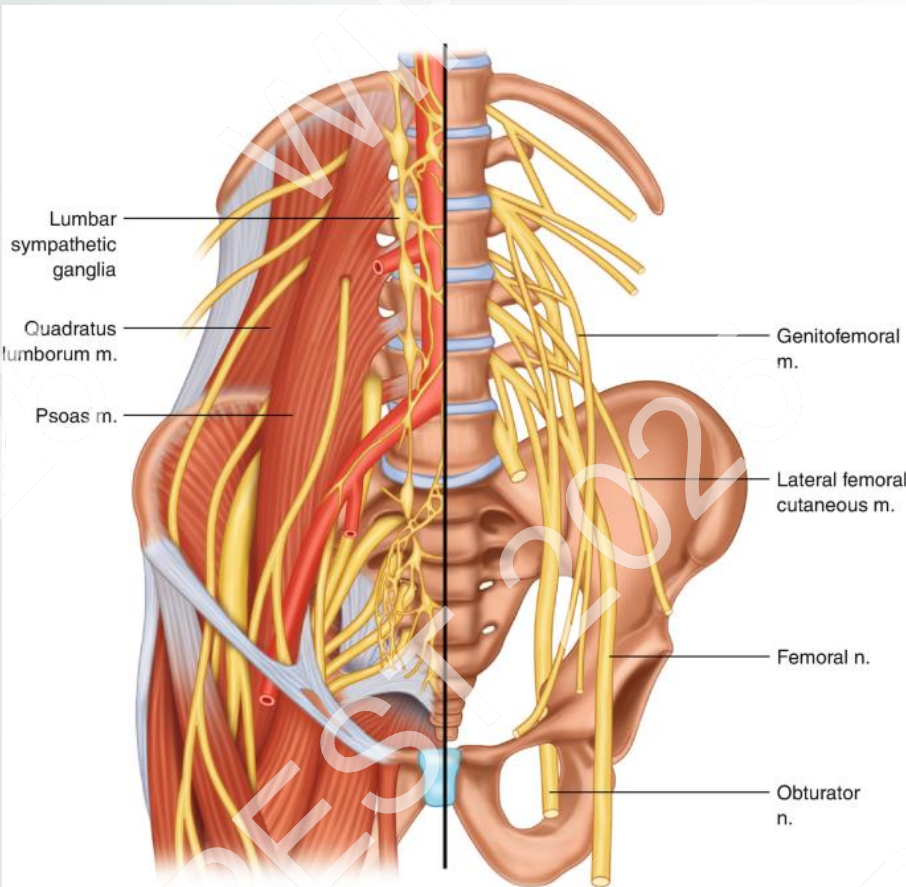


Key

- Preganglionic sympathetic neurons
- Postganglionic sympathetic neurons
- Afferent sensory neurons (visceral or somatic)

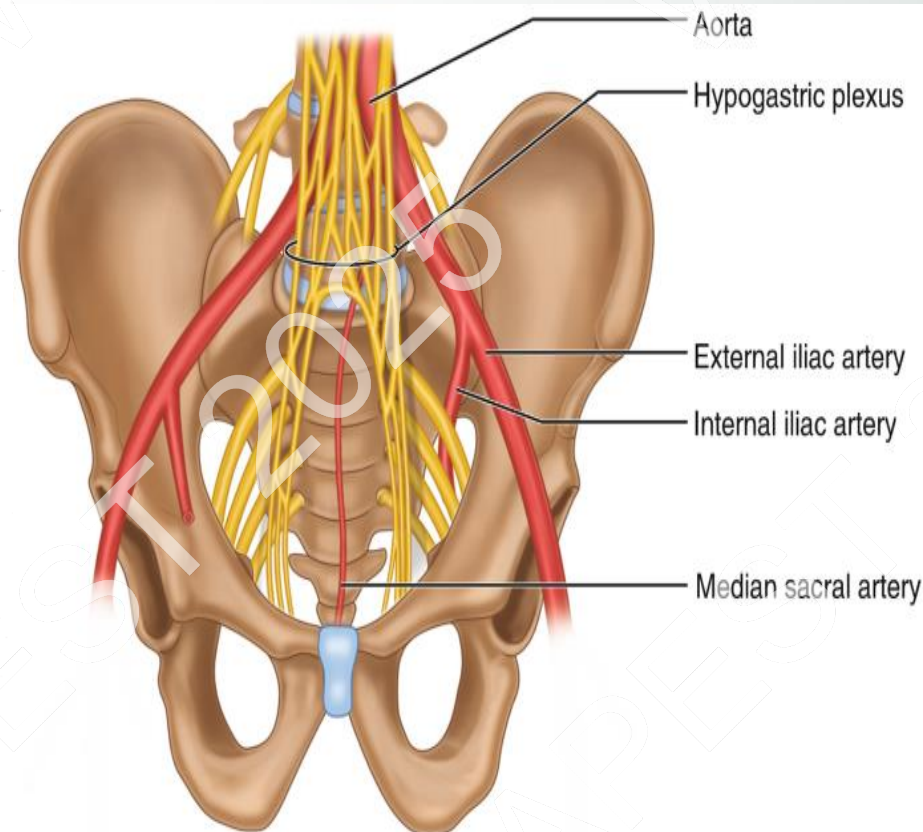
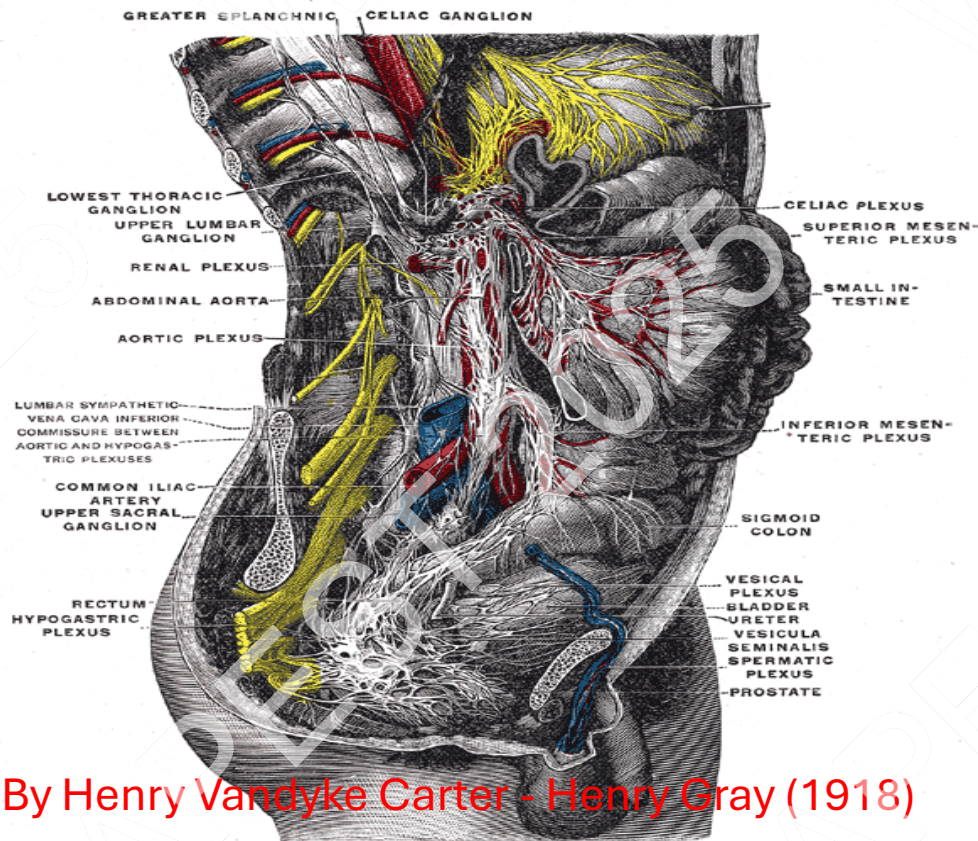


Anatomy



Superior Hypogastric Plexus Anatomy

- Located at L5-S1 vertebral level, anterior to sacral promontory, relaying visceral pelvic pain signals.





Lumbar Sympathetic Block Indications

- CRPS lower limb
- Ischemic limb pain, PVD
- Cancer-related lower limb pain
- Diabetic neuropathy





Superior Hypogastric Block Indications

- Pelvic cancer pain
- Radiation injury
- Endometriosis
- Chronic pelvic pain syndromes
- Pelvic Inflammatory Disease
- Interstitial Cystitis
- Pelvic adhesions
- Testicular or prostatic pain
- SMP of pelvis





Patient Selection & Contraindications

- Active infections in the needle trajectory and skin entrance
- Uncontrolled diabetes
- Uncontrolled heart disease
- Pregnancy
- Unstopped blood thinners
- Bleeding disorders
- Anatomical or post-surgical abnormalities that make the procedure unsafe
- Allergies to medications used
- Patient cooperation and consent issues





Patient Preparation

- Appropriate indications have been determined
- Evaluation and treatment of bleeding diathesis, contrast, or medication allergy
- Physical examination should identify previous low back or abdominal surgery, infection at the site of needle insertion
- A detailed informed consent including the potential benefits and risks as well as realistic expectations of sympathetic blockade
- We use ECG, pulse oximetry, O2 supplement, BP monitoring, and IV access during the procedure.
- Sterile environment and a facility that can handle complications
- Fasting 6–8 hours
- Informed consent
- Medication review and adjustment

Imaging Guidance Options

- Fluoroscopy (gold standard)
- CT guidance
- Ultrasound in select cases





Equipment & Medications

- Needles: 22G or 25G spinal, Blunt tip nerve block needles, Day needles
- Contrast: non-ionic contrast such as Omnipaque 240
- Local anesthetic: bupivacaine and/or lidocaine
- Steroids: Dexamethasone, Methylprednisolone
- Neurolytic agents: alcohol, phenol
- Standard OR monitors (Pulse Oximeter, BP, ECG, O2 supplementation)
- Resuscitative equipment
- Adequate assisting personnel
- Imaging equipment
- IV Fluids

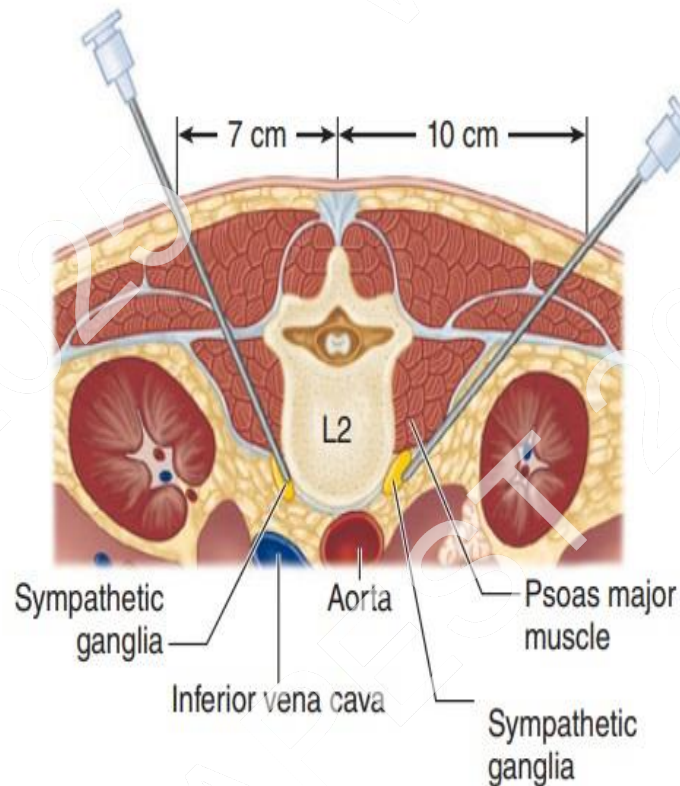
Patient Positioning

- Prone with pillow under abdomen to reduce lumbar lordosis.
- Lateral decubitus position



Needle Approach – LSB

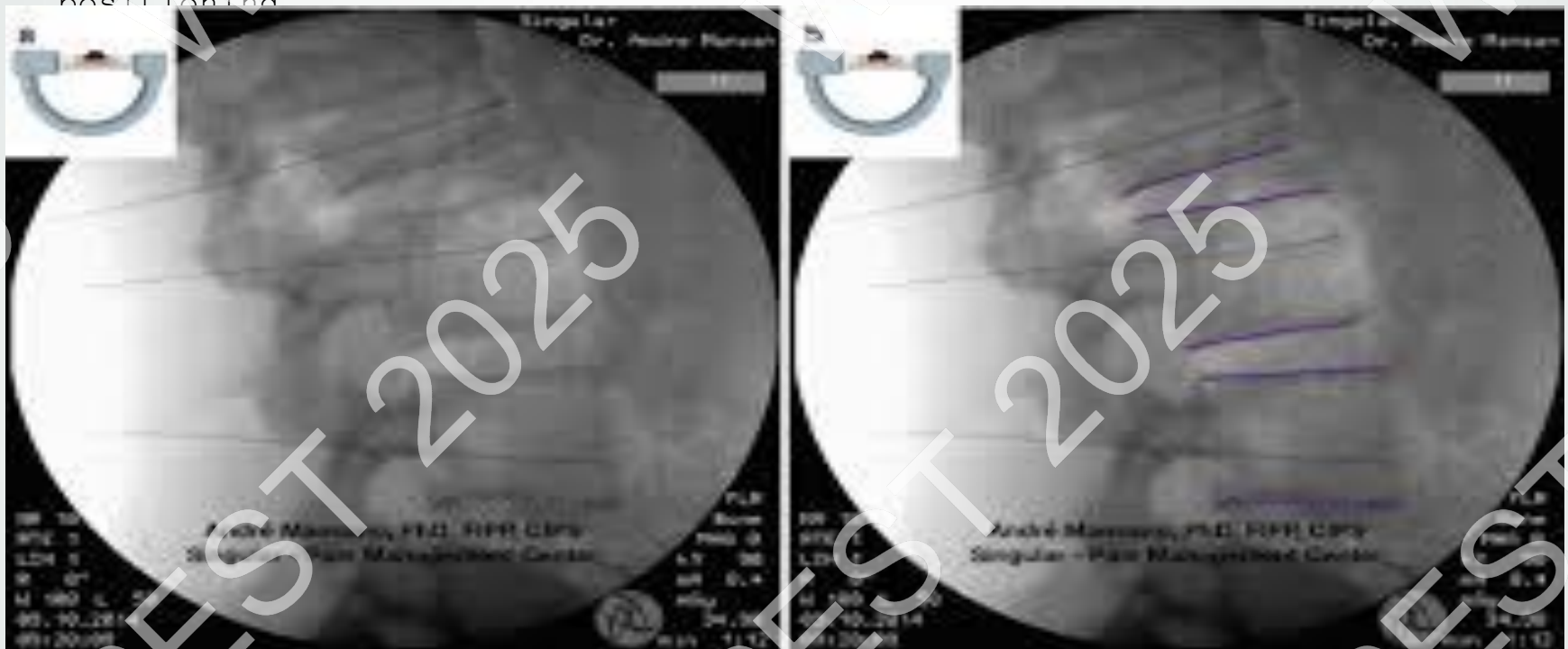
- Paravertebral approach targeting anterolateral aspect of vertebral body at L2-L4.





Fluoroscopic Imaging Views - LSB

- AP and lateral views to confirm correct depth and medial-lateral positioning



Dr. André M. Mansano, FIPP, CIPS



Lumbar Sympathetic RFTC

- Same needle placement as LS Block
- Lower 1/3 of L2, Upper 1/3 of L4 and lower part of L4 vertebral body on the lateral view
- RFTC at 80°C for 90 sec after contrast and local anesthetic injection
- Needle withdrawn 0.5-1 cm and lesion is repeated



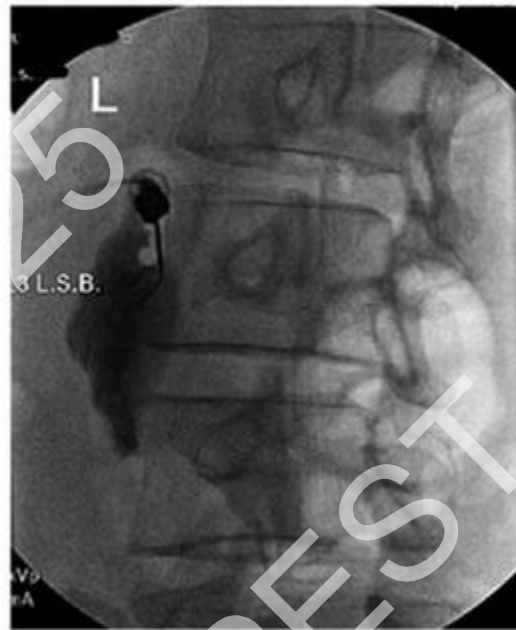
Contrast Injection & Confirmation – LSB

- Contrast outlines sympathetic chain in retroperitoneal space.

LSB



AP



Oblique



Lateral



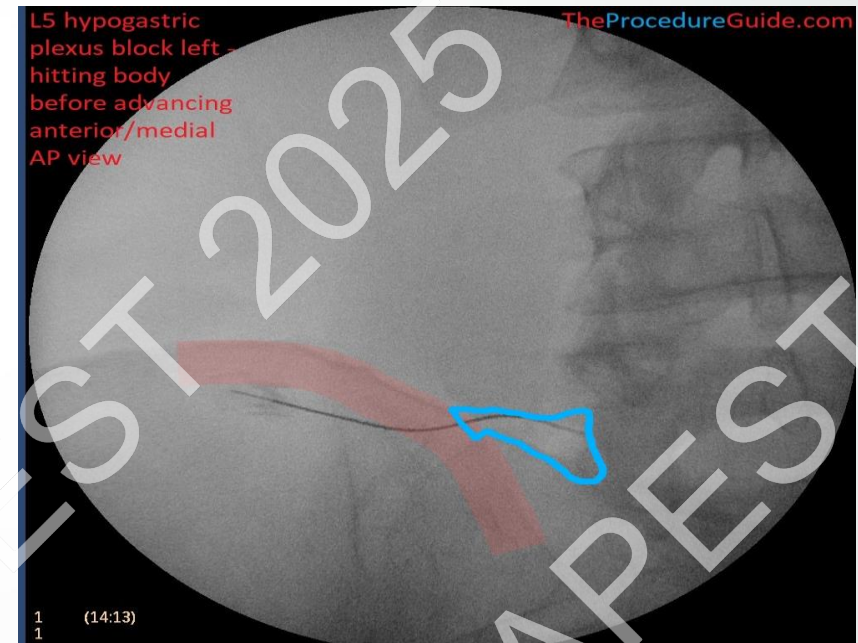
Injection Technique – LSB

- Local anesthetic for diagnostic blocks; 1%Lidocaine, 0.25-50%%Bupivacaine, 0.2%Ropivacaine
- Alcohol or phenol for neurolysis. Alcohol at 2-3cc 50-100% with higher rate of neuritis at higher concentrations. 3cc Phenol at 10%
- Botulinum toxin
- RFTC for neurolysis



Needle Placement – SHB

- Bilateral or unilateral approach to reach plexus anterior to L5-S1 disc space.
- The difference between this procedure and a LSB is that the iliac crest gets in the way of the needle path. This often leaves a narrow path to the bottom of the vertebral body and sometimes means you don't use as oblique of a view as you might for a LSB (the more oblique the view the more the iliac crest closes off that path).



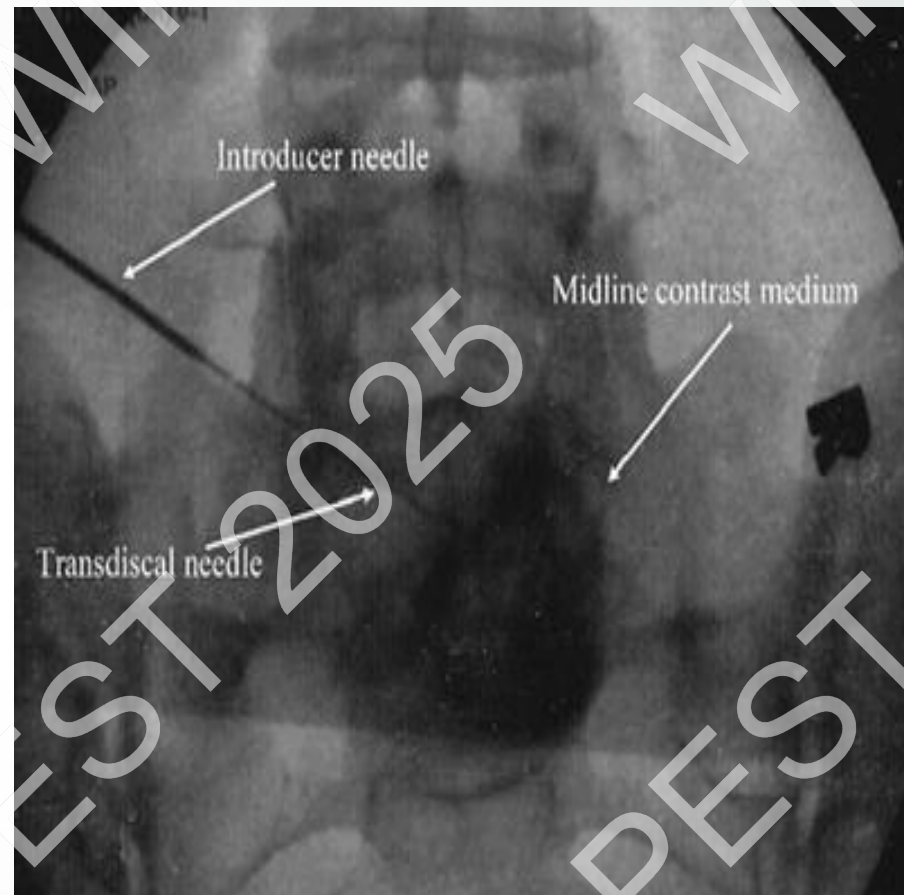
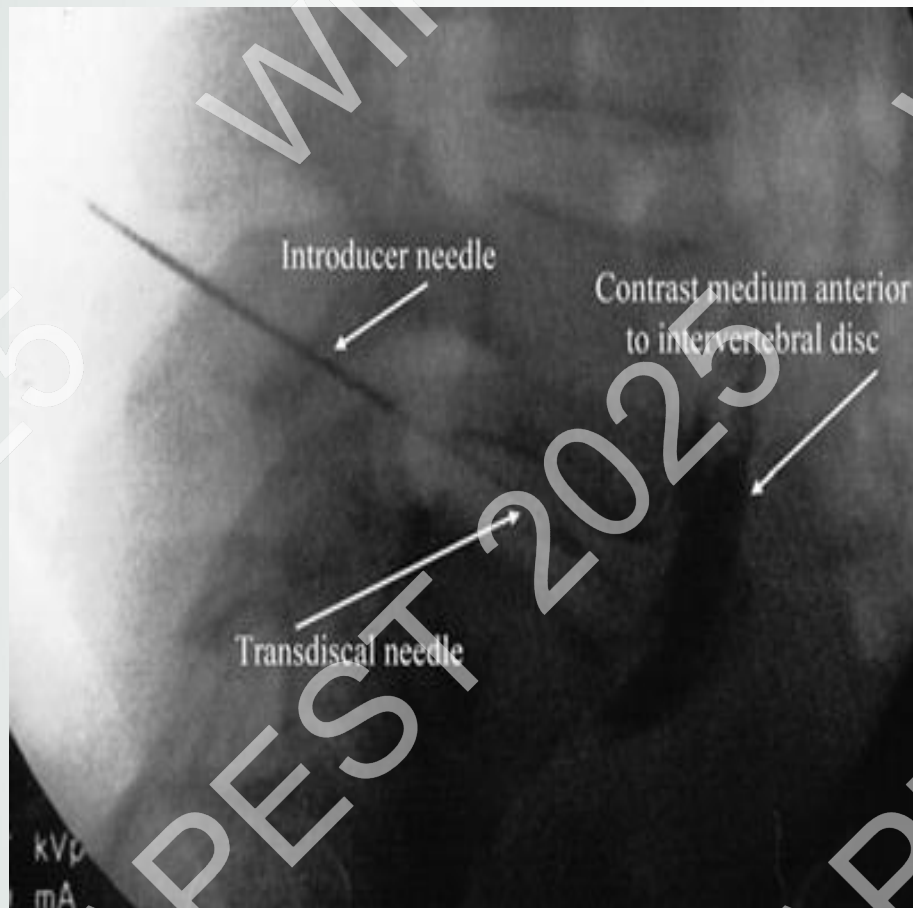


Transdiscal approach

- **SHB with** the 2 needle posterior approach with fluoroscopy guidance was first described by Dr. Plancarte et al in 1990. Dr. Erdine innovated the transdiscal approach in 2003.
- **Transdiscal Approach:**
 - Instead of the traditional posterolateral approach, the transdiscal method involves accessing the plexus through the intervertebral disc (usually between L5 and S1). This can be particularly useful when the traditional approach is challenging due to patient factors (like being unable to lie prone) or anatomical variations.
- **Advantages:**
 - The transdiscal approach may offer easier access, potentially fewer complications, and the ability to be performed in different patient positions.
- **Effectiveness:**
 - Studies suggest that the transdiscal approach can provide significant pain relief and improve quality of life in patients with pelvic cancer pain.
- **Safety:**
 - While generally considered safe, potential complications include nerve damage, discitis (inflammation of the disc), or disc herniation, though these are rare.



Transdiscal Needle Placement





Neurolytic Technique – SHB

- Neurolytic agents used for cancer pain with careful volume control.
- Ethanol at 50-100%
- Phenol at 5-15%
- RFTC

Different approaches to superior hypogastric neurolysis involve different alcohol volumes:

- One study injecting alcohol bilaterally used 6–8 mL of 75% alcohol.
- Another study using a single-needle, posterolateral transdiscal approach injected 3 mL of 75% ethanol.
- A different study using a single needle via an anterior approach used a solution of 10, 15, or 20 mL of alcohol (concentration not specified), 4 mL of bupivacaine HCl, and 2 mL of contrast medium. Best results were observed with the largest amounts of alcohol.
- A diagnostic block using 10 mL of 0.25% bupivacaine was followed by a neurolytic block using 10 mL of a solution containing 50% ethanol in 0.25% bupivacaine.
- A different study used 5 mL of absolute alcohol via a Chiba needle.

In summary, the volume of alcohol used for superior hypogastric neurolysis can vary, ranging from 3 mL to 20 mL, depending on the approach and other agents used.



Efficacy of Lumbar Sympathetic Block

- Studies show significant relief for CRPS and ischemic pain in selected patients.

Key indicators of a successful lumbar sympathetic block:

- **Increased skin temperature:**

- The most prominent sign is a noticeable increase in the temperature of the leg and foot on the side of the injection, often described as a warm sensation.

- **Flushing of the skin:**

- The skin may appear flushed or rosy due to increased blood flow to the area.

- **Pain relief:**

- Many individuals experience a reduction or even complete elimination of pain shortly after the procedure.

- **Numbness or weakness:**

- Temporary numbness or weakness in the leg can occur, but this is not a primary indicator of success and should subside when the anesthetic wears off.



Efficacy of Superior Hypogastric Block

- Superior hypogastric plexus block is an interventional technique; first described in 1990, it has been shown to provide long-lasting relief in 50-70% of patients who underwent the procedure.

A successful hypogastric plexus block is often indicated by a noticeable reduction in pelvic pain, which may be felt soon after the procedure or develop within a few days. Other potential symptoms of a successful block include a warm sensation in the pelvic area and temporary pain relief that may last for several hours or longer, depending on the medications used.



28th Annual Gabor Racz Advanced Interventional
Pain Conference and Workshop
Budapest, Hungary August 25-27, 2025



Duration of Pain Relief

- Local anesthetic: hours to days
- Neurolysis: weeks to months



LSB:

- Bleeding, bruising, swelling
- Dizziness, headache, transient numbness
- Weakness of the leg, hypotension

SHP Block

Bleeding, infection, nerve damage
Retroperitoneal hematoma
Allergic reactions, retrograde ejaculation

Common Complications

Lumbar sympathetic neurolysis:

All of the above but worse

SHP neurolysis

All of the above
Discitis for the transdiscal technique



Serious Complications

- Retroperitoneal hematoma
- Organ injury (kidney, ureter, bowel)
- Intravascular injection
- Anterior thigh pain from genitofemoral and LFC nerve damage
- Hypotension



28th Annual Gabor Racz Advanced Interventional
Pain Conference and Workshop
Budapest, Hungary **August 25-27, 2025**



Prevention Strategies

- Strict imaging guidance
- Incremental injection with aspiration
- Avoid deep sedation
- Know how



28th Annual Gabor Racz Advanced Interventional
Pain Conference and Workshop
Budapest, Hungary August 25-27, 2025



LSB in Ischemic Limb Pain

- Improves perfusion and pain; may delay or prevent amputation in severe cases.



28th Annual Gabor Racz Advanced Interventional Pain Conference and Workshop

Budapest, Hungary August 25-27, 2025



Summary

- • LSB and SHB are valuable tools for sympathetically mediated pain
- • Imaging guidance improves safety
- • Careful patient selection optimizes outcomes



28th Annual Gabor Racz Advanced Interventional
Pain Conference and Workshop
Budapest, Hungary August 25-27, 2025



Questions & Discussion

- Thank you for your attention. Questions are welcome.

