



Non-CME Webinar Series
designed with the trainee in mind

first Tuesday of the month



Approaches to Neuromodulation Dorsal Root Ganglion Stimulation

Tuesday, January 4, 2022

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No Disclosures



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Objectives

- Discuss the indications for DRG therapy
- Discuss outcomes for DRG therapy
- Discuss the approach for DRG therapy



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Outline

- How is DRG different from SCS
- Indications for DRGS
- Outcomes for DRGS
- Dermatome Mapping
- Materials and Patient Positioning
- Approach T10-L3
- Approach for L4 and L5
- Approach for S1
- Retrograde Approach



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What is Dorsal Root Ganglion (DRG) Therapy?

- Therapy designed to manage difficult to treat chronic pain in specific areas

How is this different from SCS?

- Form of neurostimulation where the mild electrical signals target specific structures on the spinal column (Dorsal Root Ganglia) that are involved in a person's localized pain (1)

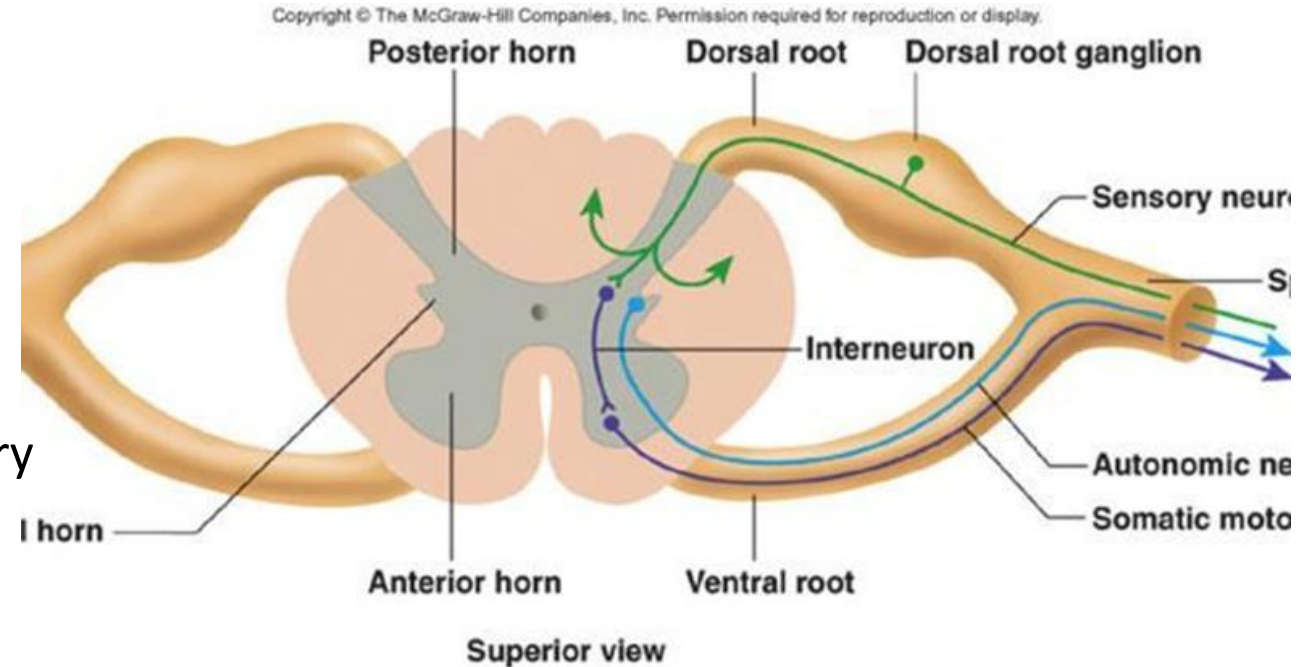


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- Dorsal Root Ganglion
 - Houses the cell bodies of the AFFERANT sensory neurons
 - Afferant (AFFECTS you)
 - Efferent (causes an EFFECT – motor)
- Ideal target for therapy, only place on nerve root which is purely sensory.





Indications

- Complex Regional Pain Syndromes Types I and II
 - Foot, Ankle, Knee, Hip, Groin, Pelvis
- Potential for other non CRPS focal pain syndromes
 - Phantom Limb Pain, Perineal Pain, Inguinal Neuralgia, Failed Back Surgical Syndromes, Distal upper extremity, osteoarthritis



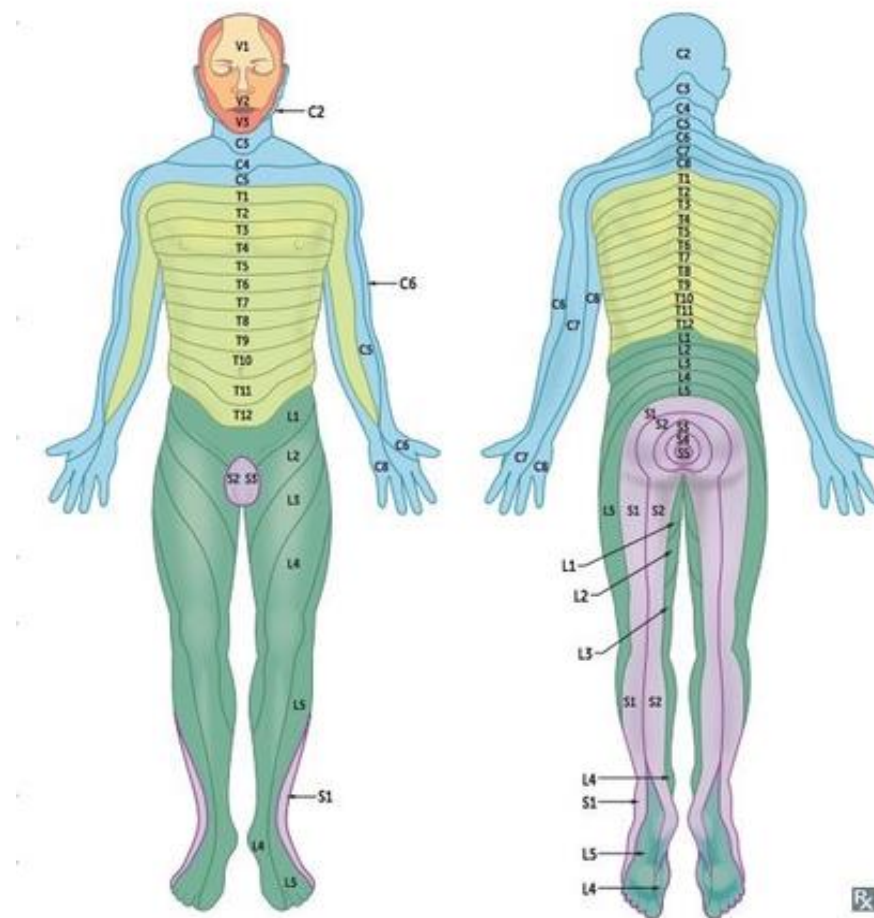
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Dermatome Map

- Foot – S1, L5, L4
- Ankle – L5, L4
- Knee – L3, L4
- Hip – L2, L3
- Groin – T11-L2





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OUTCOMES



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Accurate Study

- Accurate Study by Deer et al (2016) – Prospective, multi center, Randomized Controlled Trial that compared DRGS to SCS for intractable lower extremity pain
- Primary End Point: Treatment success rates for the DRG subjects compared to the SCS subjects
- 320 patients consented – 152 randomized – 55 made it to 12 mo follow up in the DRG arm, 50 made it to 12 mo follow up in SCS arm



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FIGURE 1. ANALYSIS OF MITT POPULATION AT 3 MONTHS AND 12 MONTHS

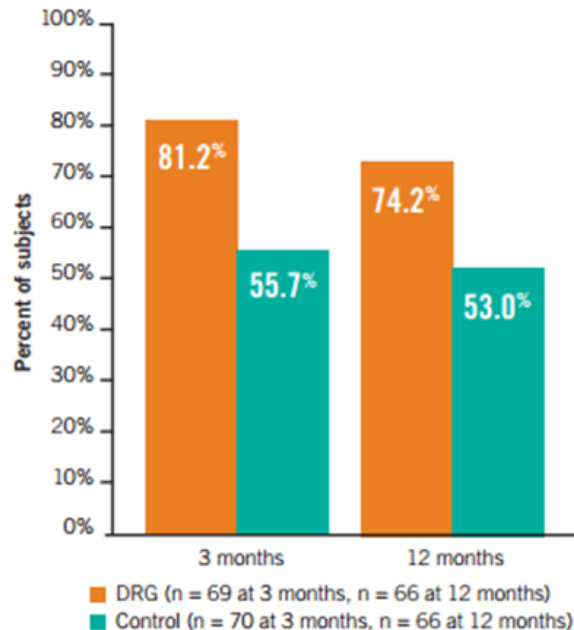
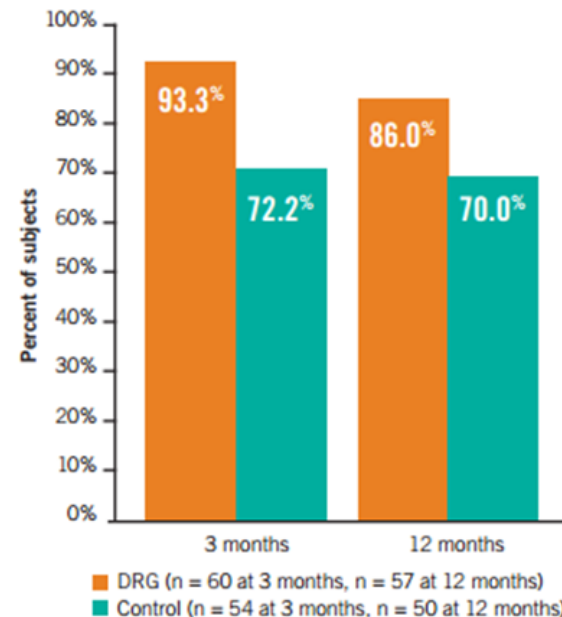


FIGURE 2. ANALYSIS OF IMPLANT ONLY POPULATION AT 3 MONTHS AND 12 MONTHS



- At three months, in the IO population, 93.3% of patients receiving DRG stimulation achieved the primary endpoint versus 72.2% of patients receiving traditional SCS (Non-inferiority $p < 0.0001$; Superiority $p = 0.0011$) (Figure 2).

Finally, subjects using DRG stimulation reported less postural variation in paresthesia ($P < 0.001$) and reduced extraneous stimulation in nonpainful areas ($P = 0.014$), indicating DRG stimulation provided more targeted therapy to painful parts of the lower extremities



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What about other focal pain states:

Back Pain - Kallewaard, J. W., Edelbroek, C., Terheggen, M., Raza, A., & Geurts, J. W. (2019). A prospective study of dorsal root ganglion stimulation for non-operated discogenic low back pain

Pelvic Pain - Hunter, C. W., & Yang, A. (2018). Dorsal root ganglion stimulation for chronic pelvic pain: A case series and technical report on a novel lead configuration.

Phantom Limb Pain - Eldabe S, Burger K, Moser H, et al. (2015) Dorsal Root Ganglion (DRG) Stimulation in the Treatment of Phantom Limb Pain (PLP).

Inguinal Neuralgia - Liem, L., & Mekhail, N. (2016). Management of postherniorrhaphy chronic neuropathic groin pain: A role for dorsal root ganglion stimulation.

Osteoarthritis - Yu, G., Segel, I., Zhang, Z., Hogan, Q. H., & Pan, B. (2020). Dorsal root ganglion stimulation alleviates pain-related behaviors in rats with nerve injury and osteoarthritis.



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APPROACH



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Materials Included in the DRG Kit

Touhy

Sheath – Big Curve and Little Curve

Lead

Stylet

Guidewire



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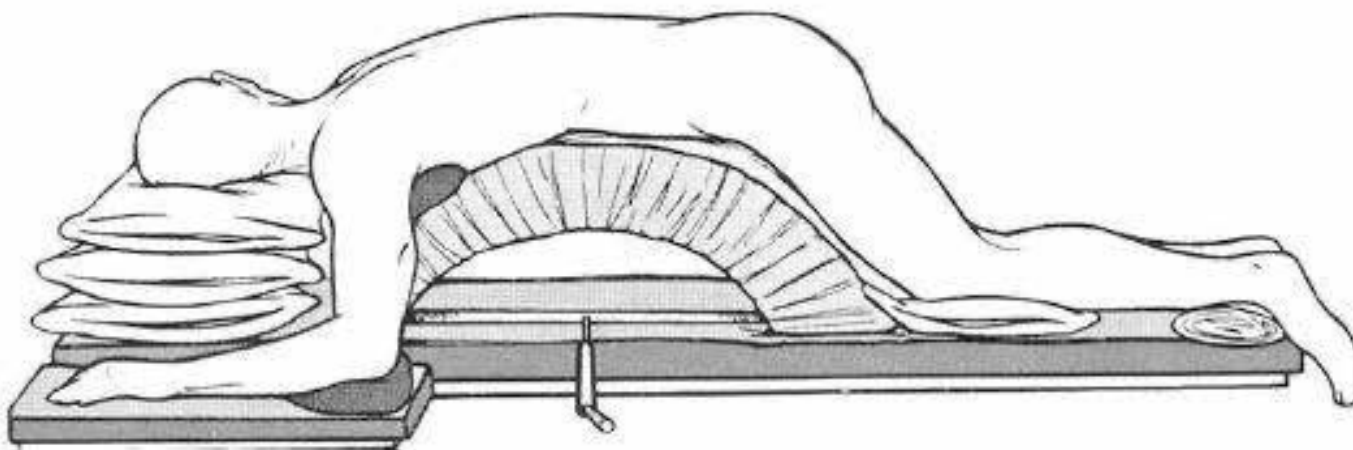
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Patient Positioning

Prone with support to
decrease the amount of
lumbar lordosis

Good C-Arm position is vital
to success





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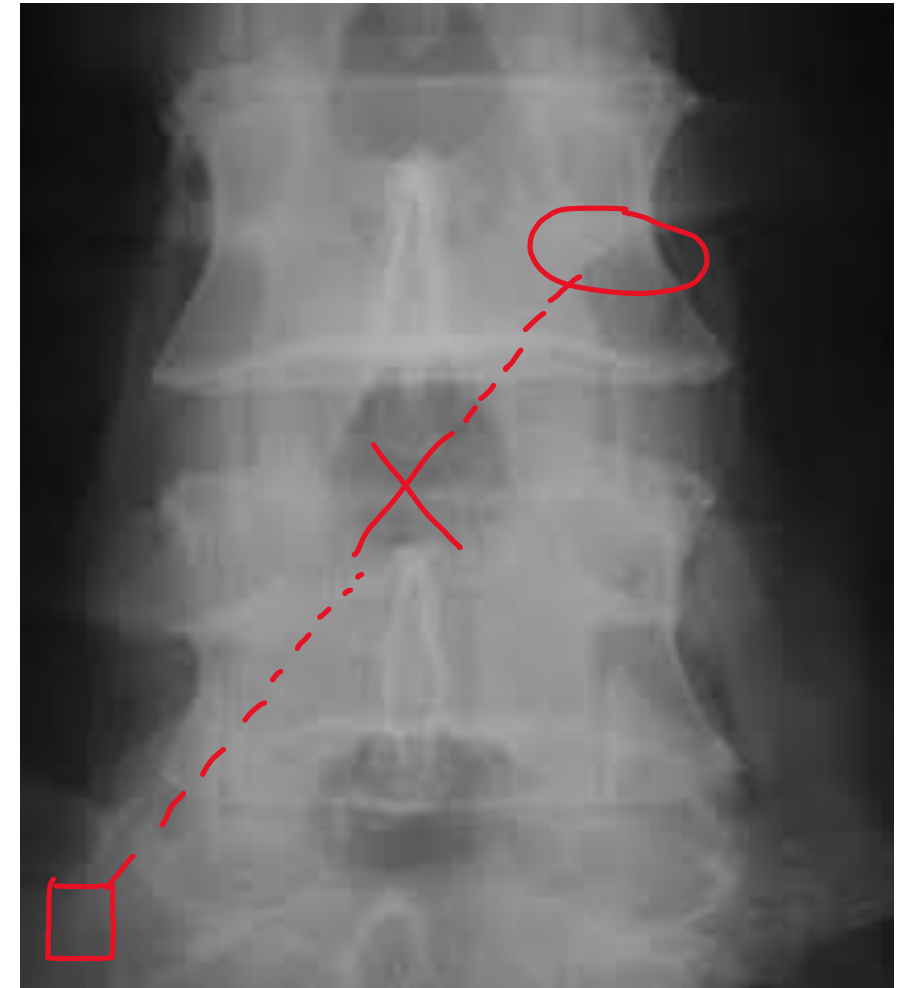
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The DRG is in consistent in its 6 o'clock position inferior to the pedicle

Good idea to have your vertebral body end plates squared and spinous processes looking directly at you





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Approach T10-L3

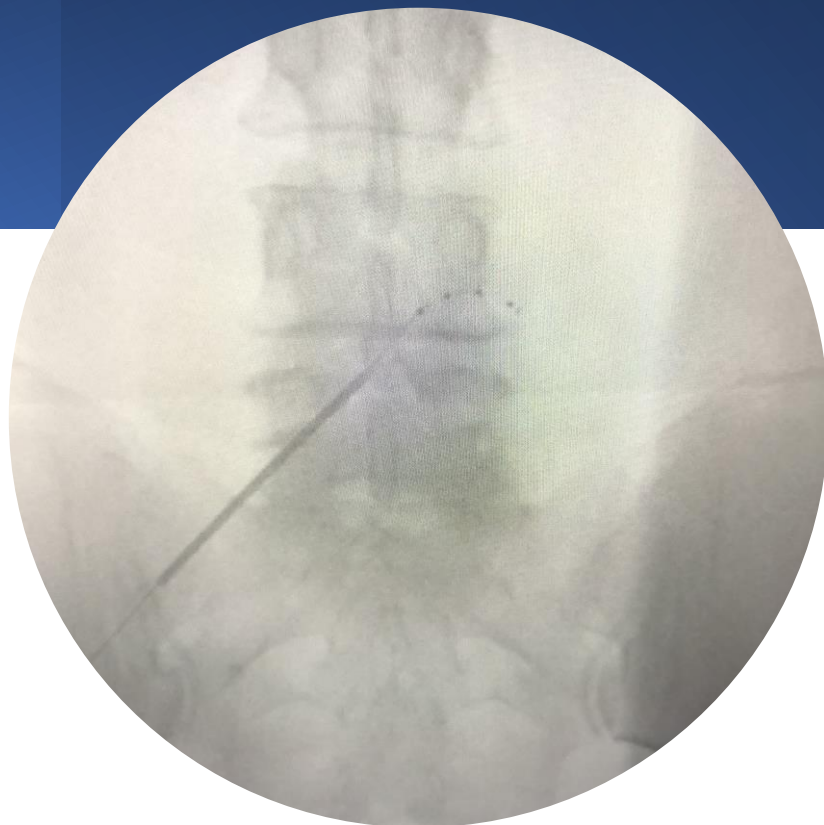
- Start two pedicles beneath target



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Approach to L4 and L5

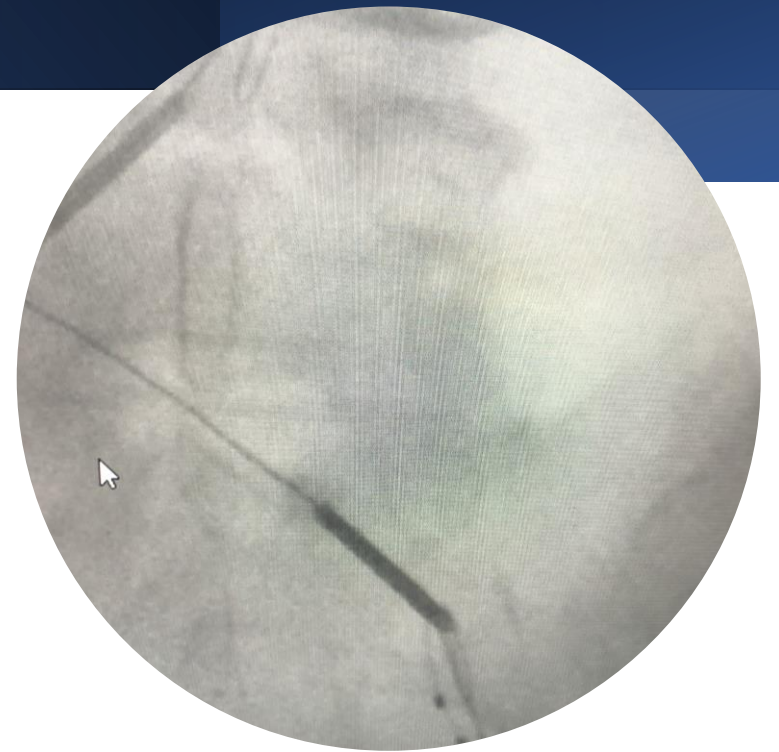
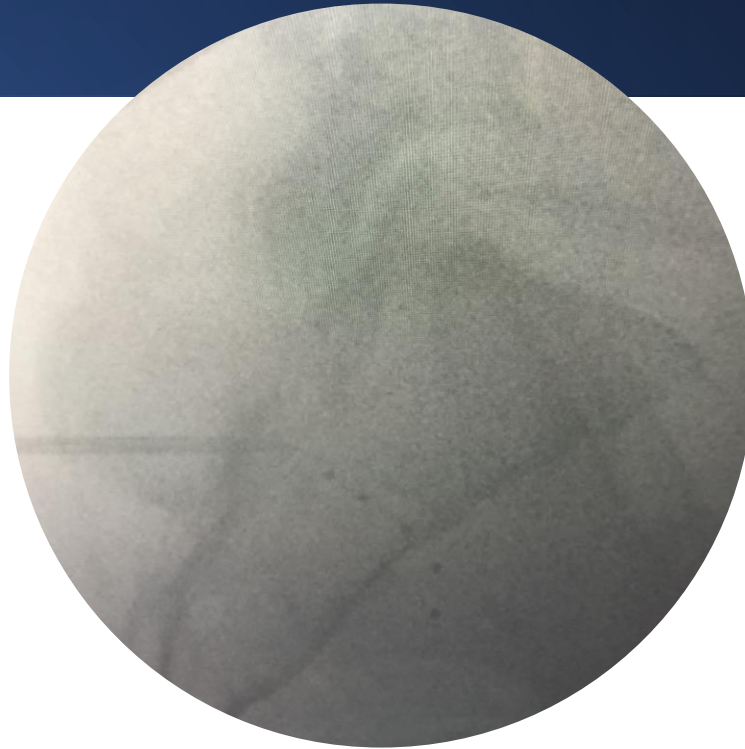
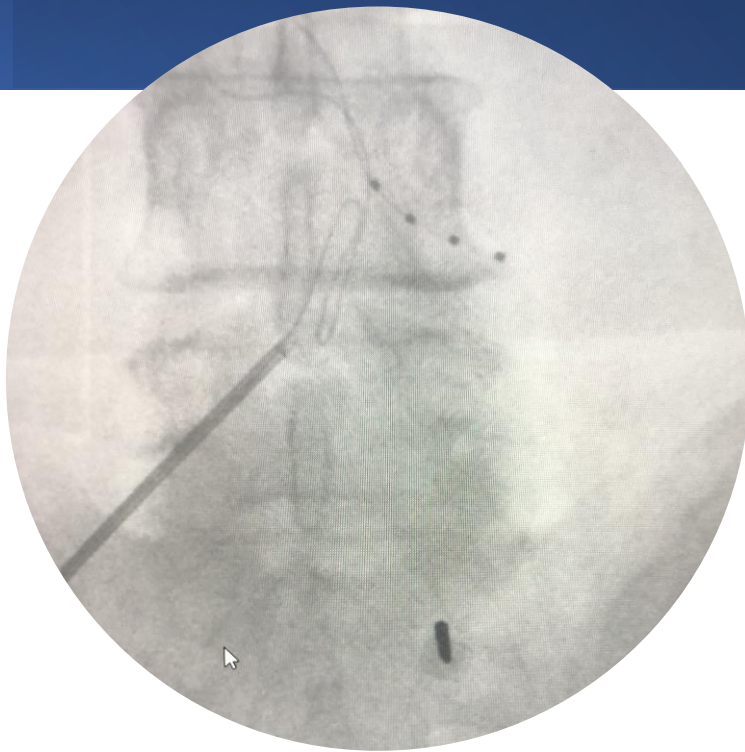
- Start around S1 or S2



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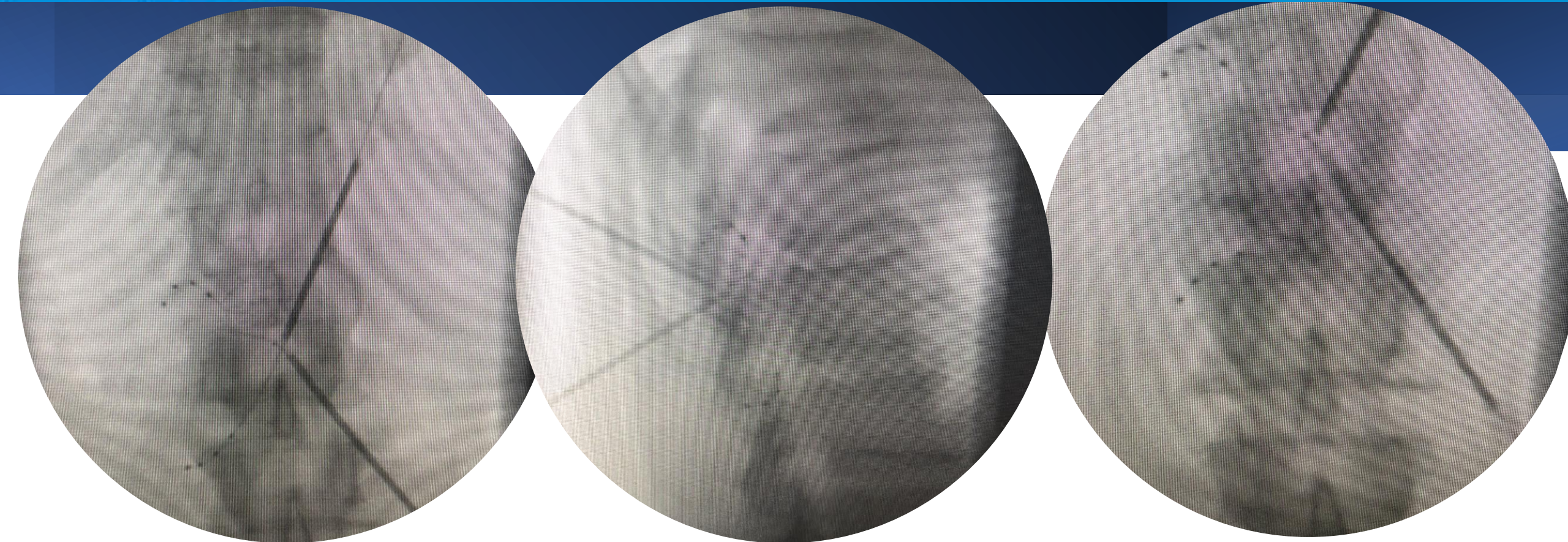
- Approach to S1
- Approach at 90 degrees to the foramen



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- Retrograde approach



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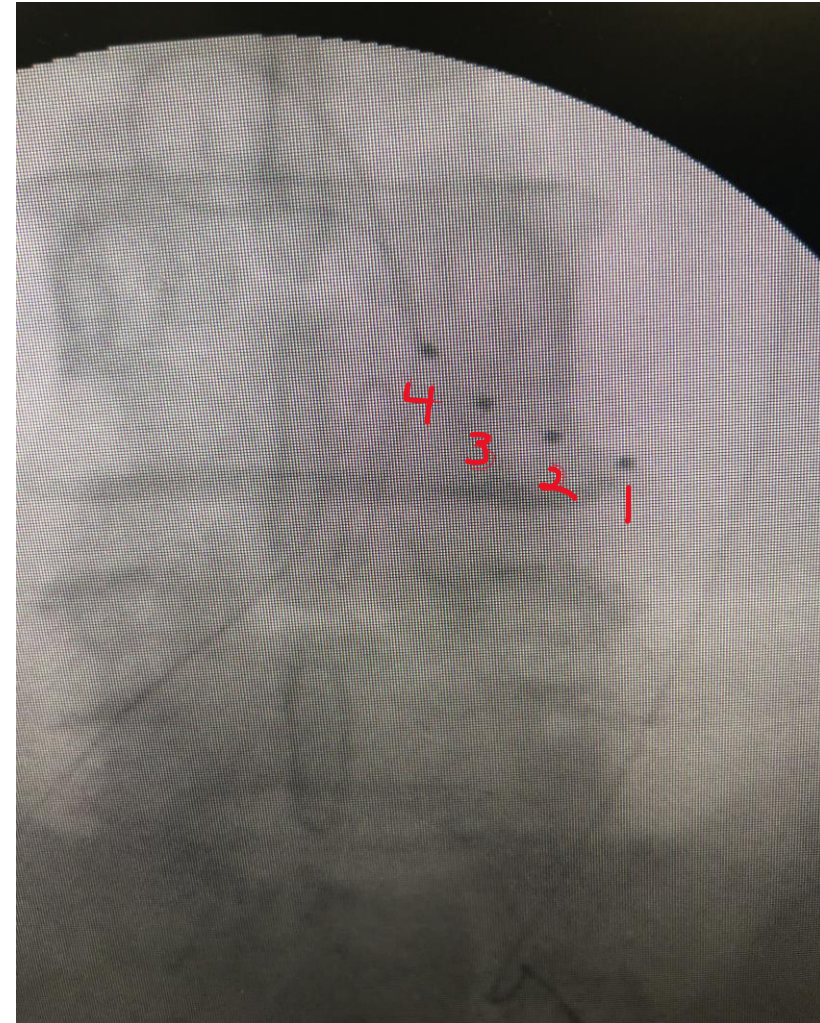
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Final Position

- Contact 3 under midline of pedicle
- Superior or cranial in the foramen
- Dorsal position in lateral view





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