



Musculoskeletal Imaging and Intervention Section Procedures Lumbar Epidural Steroid Injection – Midline Approach

INDICATIONS

- Multilevel spine disease, especially acquired spinal or foraminal stenosis
- Herniated disk with nerve root irritation offering a greater potential therapeutic benefit compared to a focal nerve block

RISKS

- Pain • Bleeding / Hematoma • Allergic reaction • Infection • Transient weakness • Intrathecal injection

PREREQUISITES

- Patient accompanied by someone to drive home.
- Prior cross sectional imaging study to select the best approach; assure posterior epidural fat present at targeted level.
- Obtain signed consent.

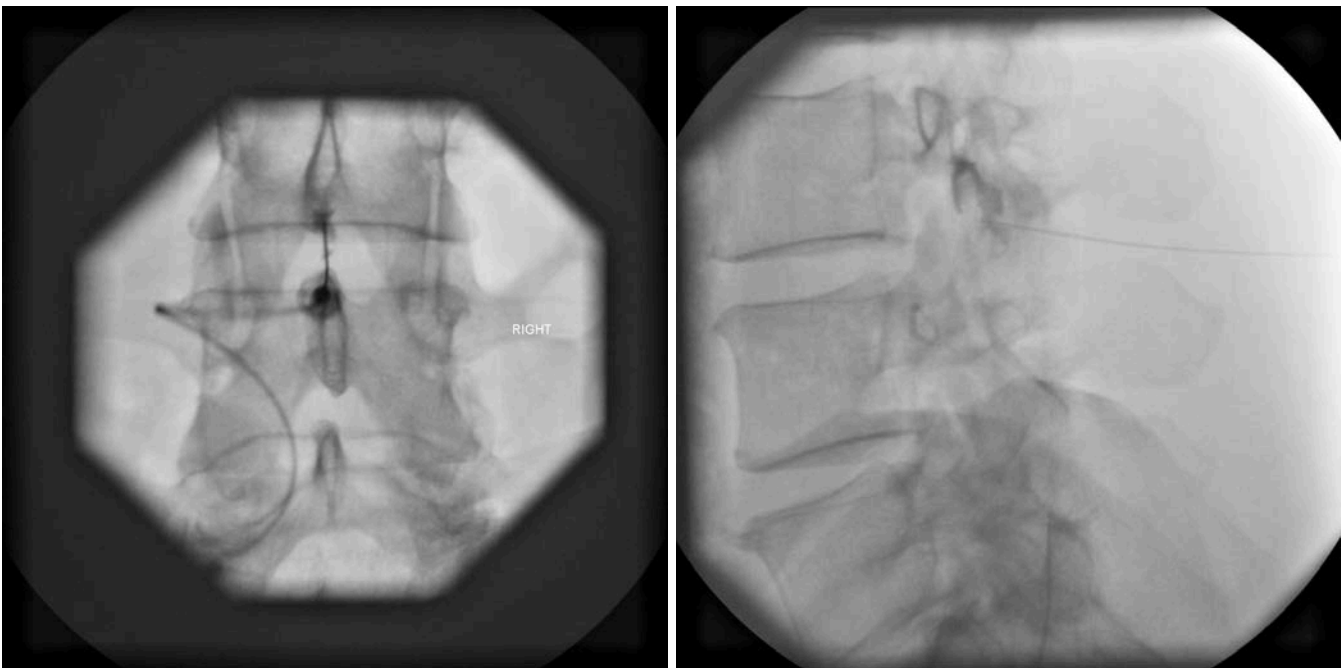
MATERIALS

- 3 cc syringe (Medallion-type—very slick)
- 25G 3.5" needle
- 1% lidocaine (for skin numbing); preferably buffered with sodium bicarbonate
- Omnipaque 300
- 0.5% preservative-free lidocaine without epinephrine (5 mL)
- Kenalog (triamcinolone) 80 mg (2 mL)

TECHNIQUE

1. Review imaging, check request, and discuss symptoms with patient to confirm or determine level. When evaluating the patient's MRI, always identify the location and amount of epidural fat at the targeted level.
2. Position the patient prone on the table as straight as possible so that there is no tilt to the left or right.
3. Place pillow or bolster under abdomen to open up the the space between the spinous processes.
4. Angle the tube caudally or cranially in order to profile the space between the spinous processes and target the portion of the epidural space with the most fat as seen on the patient's MRI.
5. Anesthetize skin and subcutaneous tissues.
6. Insert 25G 3.5" needle until the tip is ~2 mm past the posterior cortex of the inferior articular processes on the lateral view.

7. Attach 3 cc syringe and perform air test (plunge ~ 1 cc air and release, if the plunger bounces back, the tip is in the interspinous ligament; when reaches fat, plunger stays depressed).
8. Advance needle in 1-millimeter increments performing air test with each movement until the plunger does not bounce back. After every 4 advances, replace stylet to remove any possible tissue plugs before reattaching the syringe and testing further.
9. Once there is an air release, confirm that the needle tip is in the epidural space with a small injection of contrast. Capture AP and lateral images for PACS
10. Inject the 7 mL admixture of 2 mL Kenalog / 5 mL 0.5% lidocaine. At the beginning of the medication injection, one must view fluoro in the lateral projection: it is technically possible to advance the needle into the thecal sac while switching from contrast to medication; so, you have to watch as the last little bit of contrast in the tubing enters the patient to assure that the needle still is not intrathecal. Save one more lateral spot image for posterity.
11. Remove the needle.



POTENTIAL PITFALLS AND TIPS:

1. Intrathecal Needle Placement: Contrast injected into the intrathecal space will layer on the dependent ventral margin of the thecal sac immediately posterior to the vertebral bodies. If the thecal sac is entered, the injection is terminated at that site as injection would result in a spinal anesthetic block. A second attempt at another site can be made if the needle is 25- gauge, but reschedule the patient if it is 22-gauge needle
2. Partial Air Release: Occasionally, as the needle is advanced with the air-release technique, there is only a partial air release. This is also a sign of entry into the epidural space, and further advancement may result in entry into the thecal sac—assume it's in and proceed with contrast.
3. Early Air Release: If an air release occurs before expected, the position may be posterior to the ligamentum flavum, a space that can accept air insufflation. On contrast injection in this location, contrast will flow between the spinous processes posteriorly. Once contrast has been injected through a needle,

the air release technique is no longer reliable (because there is fluid in the needle) and further checks for entry into the epidural space should be performed with contrast injection with small incremental advances of the needle.

4. If the patient is too large for a 3.5" needle to reach the posterior epidural space, one must use a 6" needle. However, a 25G 6" needle is too floppy, so you will need to use a 22G needle.

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