



## **Musculoskeletal Imaging and Intervention Section Imaging Procedures**

### **Cervical Epidural**

#### **INDICATIONS**

- Multilevel spine disease, especially acquired spinal or foraminal stenosis
- Herniated disk with nerve root irritation as an alternative to a focal nerve block

#### **RISKS**

- Pain
- Hematoma
- Allergic reaction
- Epidural abscess
- Transient hypotension (only with anesthesia injection)
- Intrathecal injection (arachnoiditis, meningitis)

#### **CONTRAINDICATIONS**

- Local skin infection
- Concurrent illness (e.g. cold, flu)

#### **PREPROCEDURE COUNSELLING**

- Discuss patient's symptoms and results of prior injections
- Take brief past medical and surgical history including allergies
- Explain the procedure in detail
- Explain the expectations of the procedure
  - Can expect some immediate relief for a few hours due to lidocaine 0.25% with return of pain later in the day
  - Should expect some result within 1 – 2 day
  - Can likely expect 6 – 8 weeks of pain improvement and/or relief. There is a broad range of potential results from resolution of pain to no change in symptoms.
- Explain activity limitations post procedure
- Take it easy the remainder of the day, can return to routine activity the following day

#### **PREREQUISITES**

- Directed history is taken including symptoms, previous surgery, prior injections, allergy history, and other medical conditions including cardiac disease and diabetes
- Patient accompanied by someone to drive home.

- Prior to the procedure, it is critical to review the patient's cross sectional imaging study to select the best approach. Neither the interlaminar or interspinous approach has been shown to be more efficacious. At our institution, the interlaminar approach is preferred.
- AP and lateral C-spine plain films in last month to exclude infection, tumor, etc. as cause of back pain.
- Obtain signed consent.

## MATERIALS

- Fluoroscopic unit
- Betadine
- 18G 1 ½" needle (3)
- 25G 1 ½" needle
- 22G 3 ½" needle, 10 curve
- 4x4s
- Steridrape
- Sterile towels
- 9 cc lidocaine 1%, preservative free, buffered with 1cc Sodium Bicarbonate Syringes: 10 cc (1), 5 cc (1), 3 c (2)
- IV Heplock Connecting tubing, short
- Omnipaque 300
- Kenalog Steroids (2 cc [80 mg])
- 3 cc lidocaine 0.25% (mix equal volumes 0.5% lidocaine, preservative free, with sterile saline)



Fig 1: Cervical epidural injection meds.



Fig 2: Cervical epidural syringes and needles.

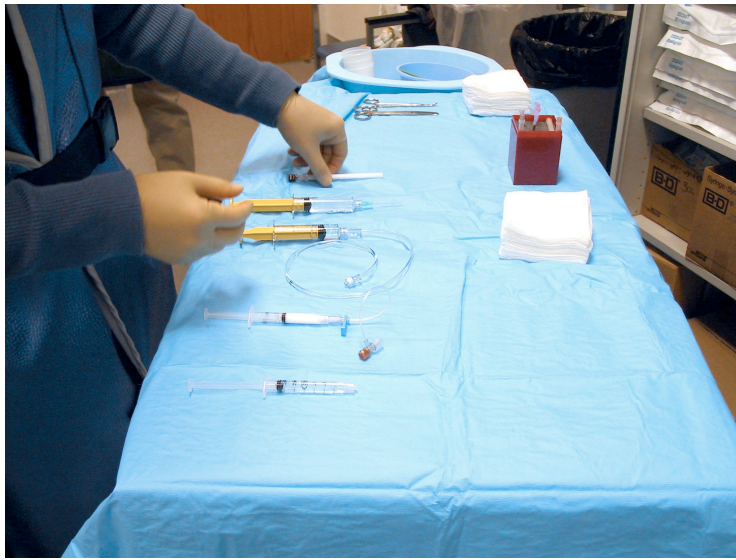


Fig 3: Cervical epidural injection table setup.

### **TECHNIQUE – Cervical ESI**

1. Attention to detail in positioning of the patient is very important. The patient is placed in the prone position with a pillow under the neck and proper support for the head. Firm support pads should be placed under the patient's chest and forehead, elevating the face off the table. (Fig 4)



Fig 4: Cervical epidural injection patient position.

2. The initial target is at the mid portion of the lower of the two target vertebral bodies and midway between the pedicle and spinous process. (Fig 5)
3. Standard sterile preparation and drape are followed by anesthesia of the skin and subcutaneous tissues with 1% lidocaine buffered with sodium bicarbonate.
4. A 22-gauge Tuohy needle is the preferred needle because its blunt tip tends to push firm objects away, decreasing the risk of puncturing the dura. The Tuohy needle is inserted with cephalad angulation and advanced toward the interlaminar space with additional slight medial angulation.
5. The tube is rotated to the contralateral oblique projection, approximately 45 degrees opposite the side of the needle entrance, until the laminae take on a shingled appearance. (Fig 6). As the needle is advanced, its position should be checked in the AP projection periodically to verify that it is appropriately directed toward the midline.

The needle is stopped just posterior to the spinolaminar line. (Fig 7)



Fig 5:  
Epidural needle position, AP.

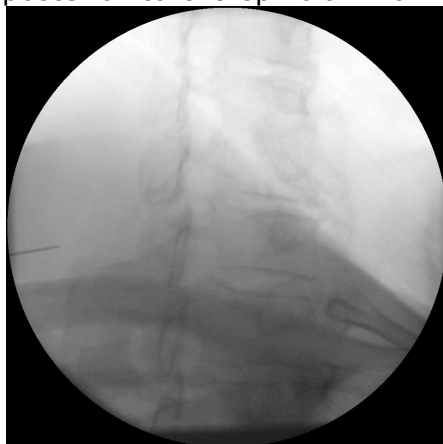


Fig 6:  
Epidural needle early, oblique.

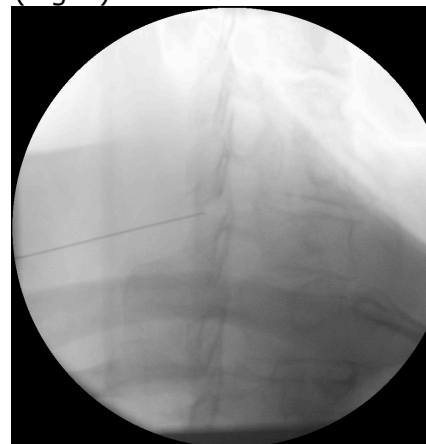


Fig 7:  
Epidural needle late, oblique

6. In this contralateral oblique projection, the remainder of the needle advancement is done with a slow advancement with intermittent fluoroscopy. Contrast "puffs" are performed once through the ligamentum flavum. Inject 1 cc Omnipaque 300 to confirm epidural position (Fig 8) in both the AP and oblique projections. Epidural contrast should flow freely from the needle and outline the dura and cervical nerve roots (Fig 9). If the contrast instead has a diluted appearance and wraps around the spinal cord, simulating a myelogram, intrathecal injection is likely. The procedure should be terminated and reattempted in about seven days. Rarely, the contrast conforms to a tubular or serpentine pattern and washes away, due to needle position in an epidural vein. Often a minute adjustment to the needle tip will extricate it from the vessel. If the needle adjustment is unsuccessful, injection at a different level should be attempted.



Figs 8 and 9: AP and lateral views following contrast injection.

7. 2 cc of Kenalog-40 (80 mg) is instilled for an average-sized adult. An additional 3 ml of 0.25% preservative-free lidocaine is added.
8. After the injection, the needle is removed, the overlying puncture site is cleansed with alcohol, and an adhesive bandage is placed. The post-procedure routine is the same as for lumbar injections.





Fig 10: Contrast injection postioning.

### **PITFALLS OF NEEDLE PLACEMENT IN CERVICAL ESI**

<b>Problem:</b>	<b>Solution:</b>
Intraosseous needle placement in osteoporotic patients	Reposition
Needle in epidural vein	Reposition
Needle in subarachnoid space	Remove needle and reschedule procedure for one week or more later