

**Single Stick Multilevel
Microcatheter
Directed Cervical
Epidural Steroid
Injections**

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Epidural History

1901: Sicard and Cathelin inject cocaine into the epidural space.

1921: Fidel Page's pioneers access to the lumbar epidural space for anesthetic injectates.

1933: Mario Diglottie perfects the "Peridural" anesthesia technique that targeted specific dermatomes.

1952: Robecchi: First recorded steroid injection into the epidural space.

1931: Eugene Aburel: Continuous epidural block utilizing a silk catheter.

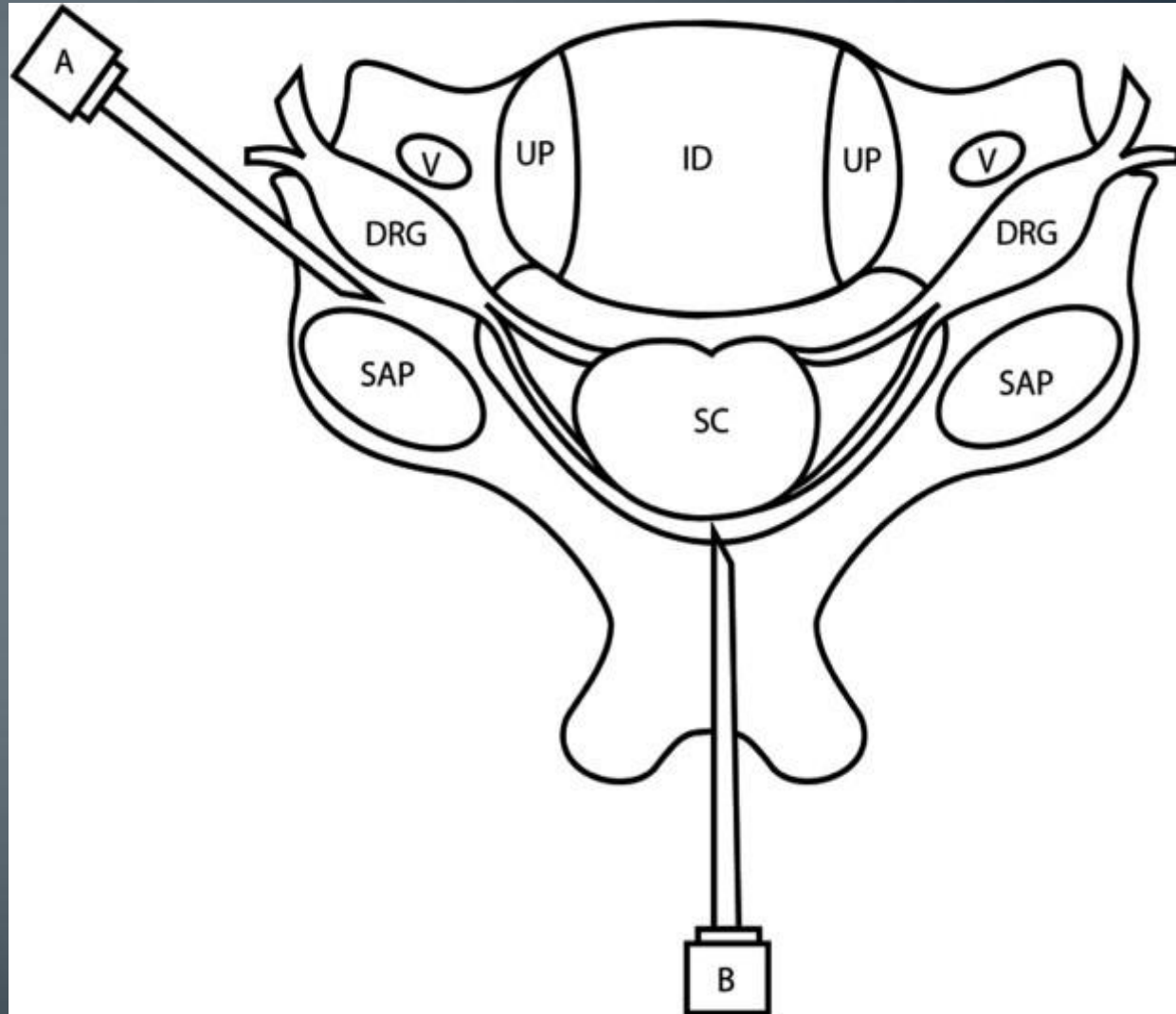
2015: Currently Cervical ESI are performed either via transforaminal or translaminar approach.

Currently there are only two options for performing epidural steroid injections in the cervical spine.

- ILESI – Interlaminar ESI (Translaminar)
- TFESI – Transforaminal ESI

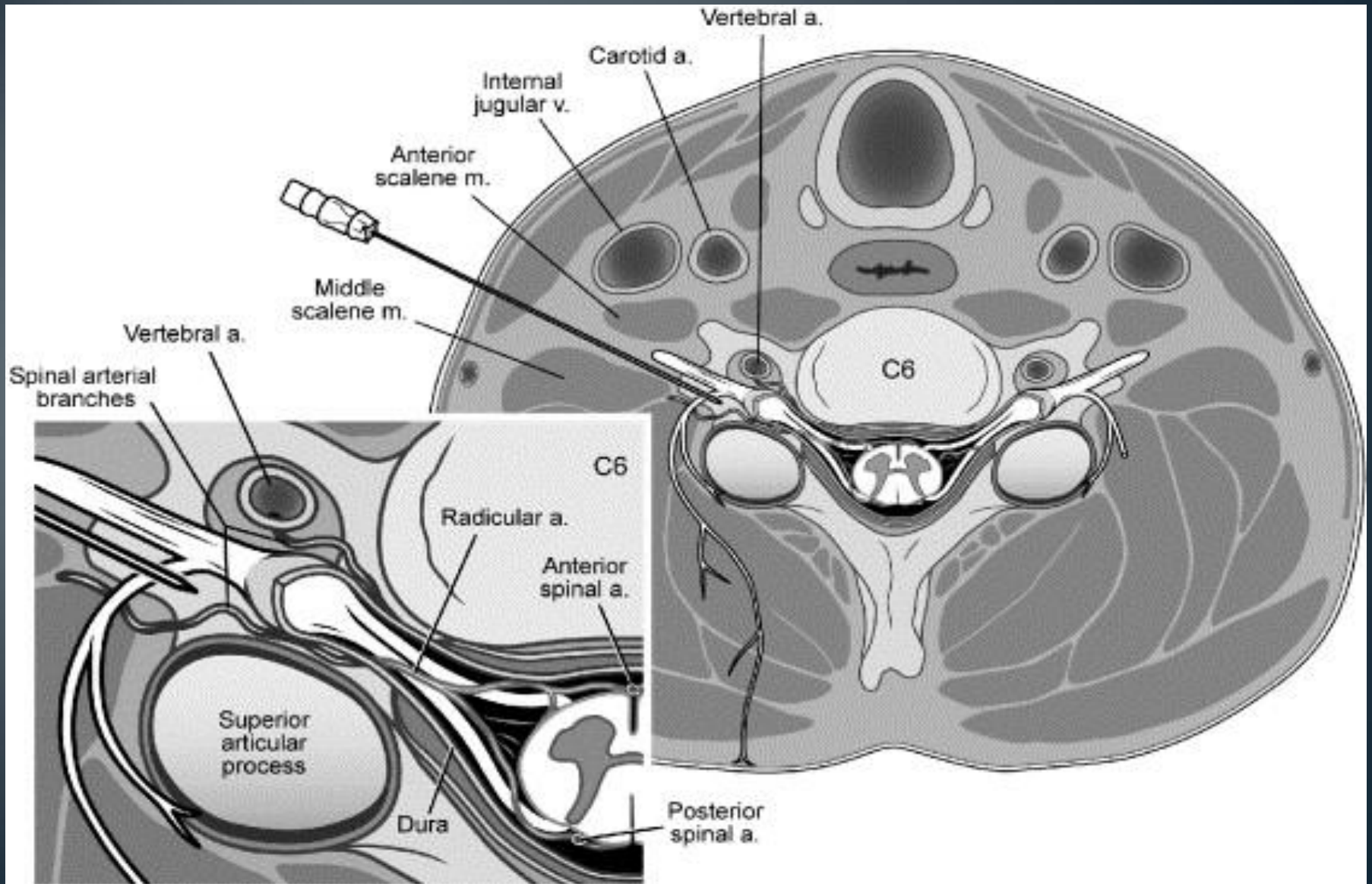
ESI in the cervical spine has been restricted to either single unilateral nerve injection (transforaminal) or broad based injection of corticosteroids at the level of C7-T1 or T1-T2 (interlaminar).

A. TFESI
Technique



B. ILESI
Technique

TFESI



We propose an alternative method which combines the accuracy of the transforaminal approach with the safety of the translaminar approach:

“Single Stick Multilevel Catheter Guided Cervical Epidural Steroid Injections.”

Potential advantages of the Single Stick Catheter Technique:

Patients with multilevel disease involving several dermatomal distributions can be treated via single stick access to the epidural space.

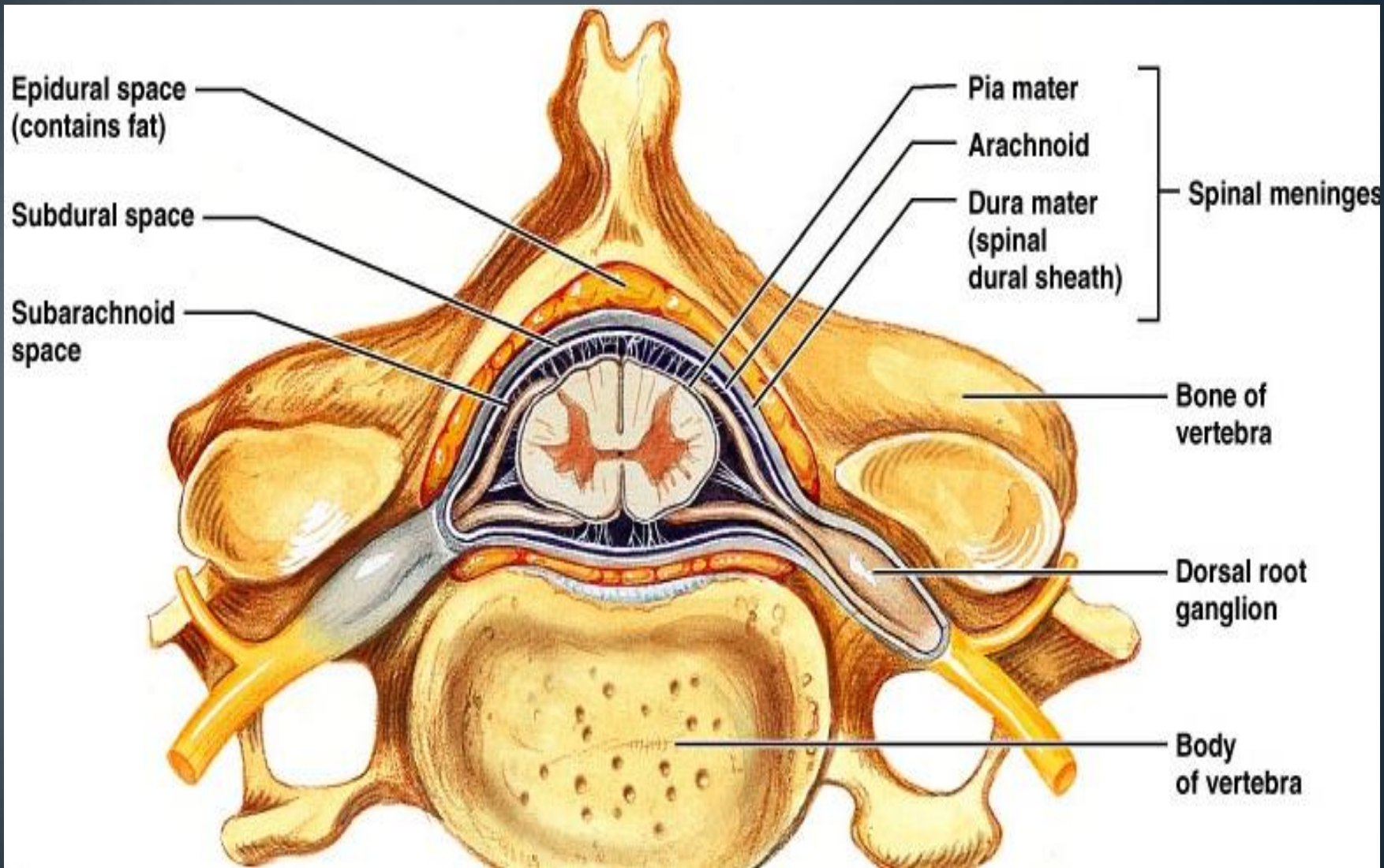
Ability to deposit steroid close to pain generator.

Decreased potential for vascular trespass compared to transforaminal approach.

Ability to access cephalad levels (C3-C4) not technically feasible with standard translaminar techniques.

Typical patient with multilevel spondylosis and symptoms corresponding to several dermatome levels.





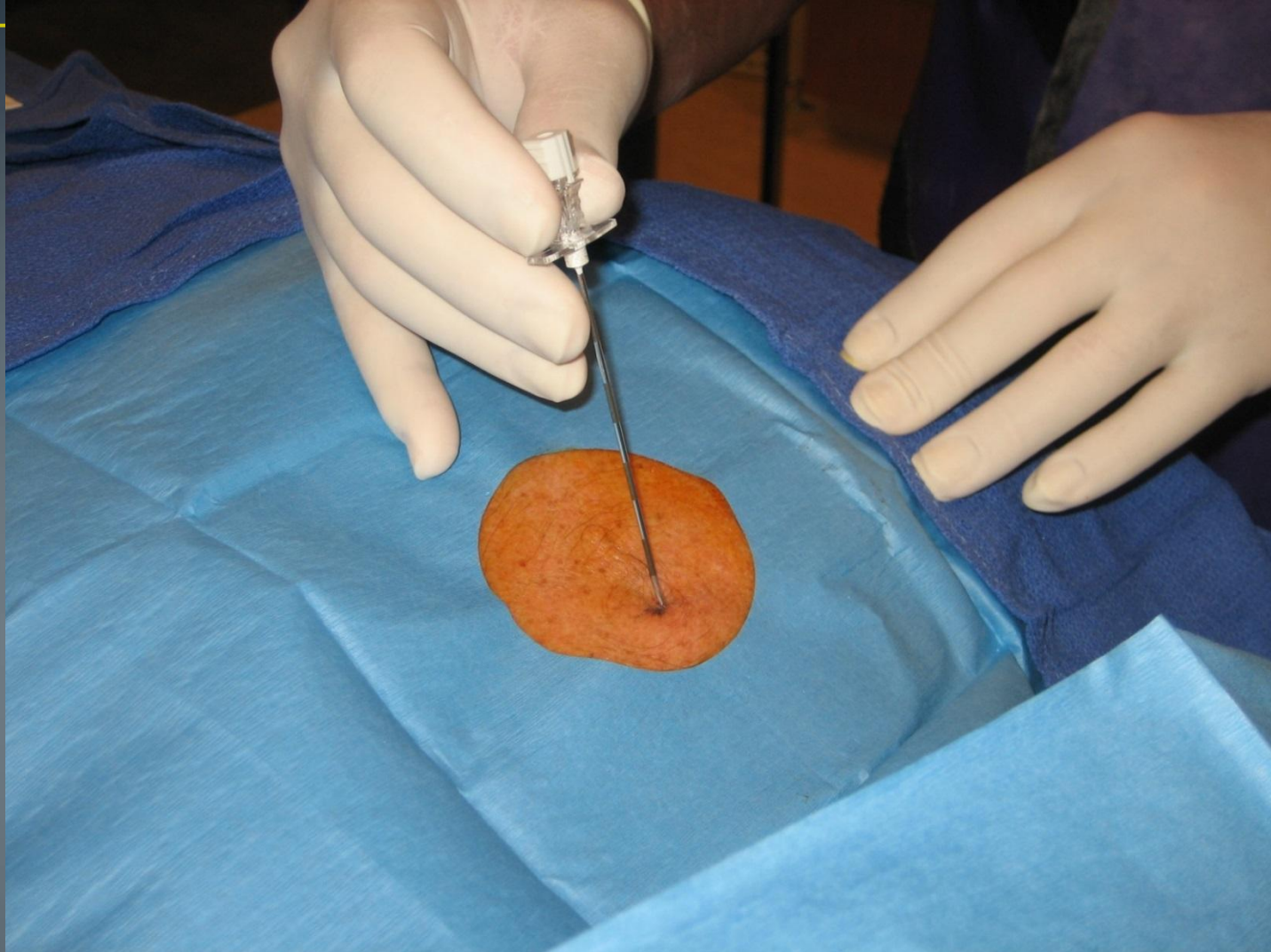
Technique:



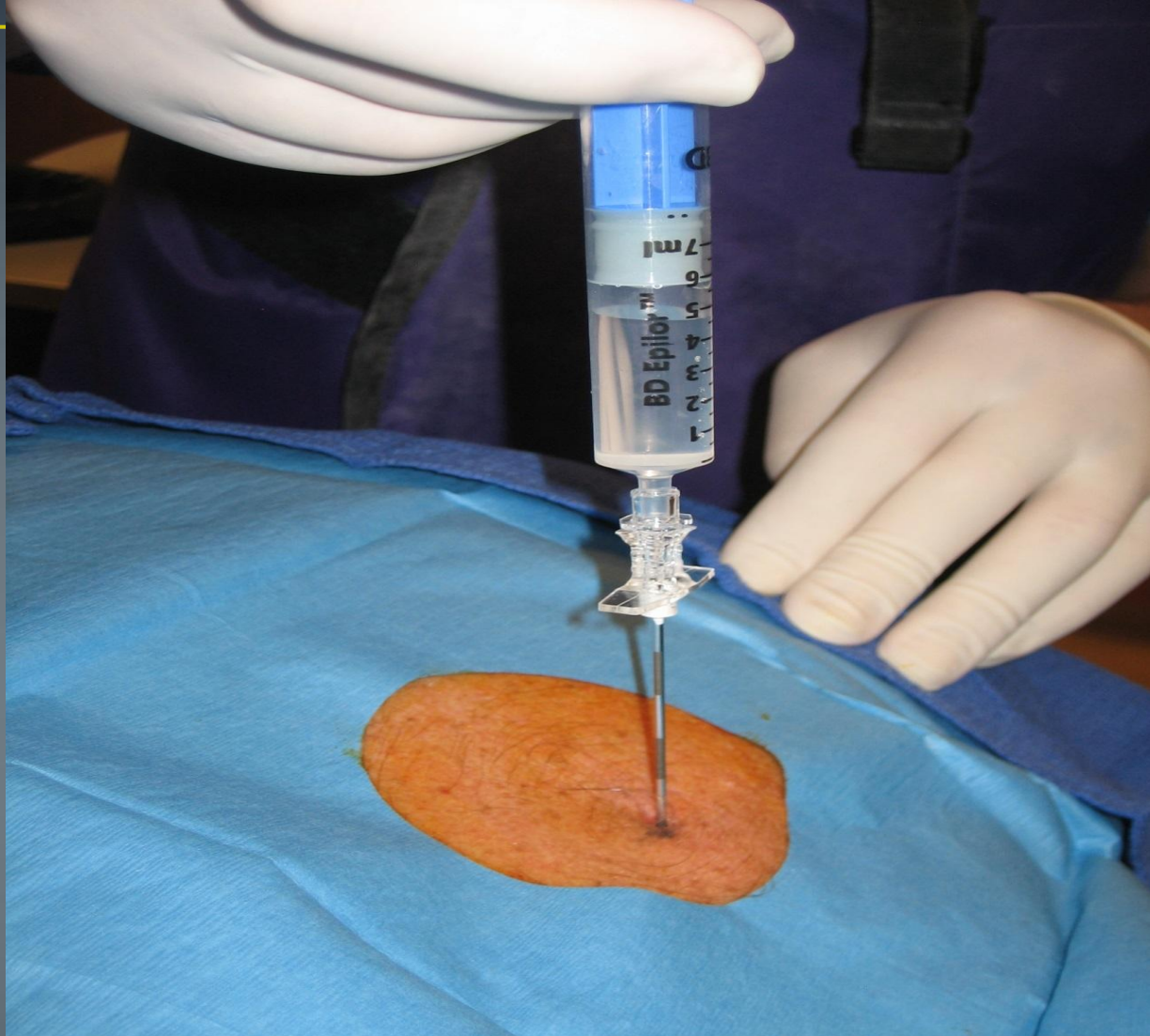
All procedures performed using sterile technique and fluoroscopic guidance.



T1-T2 Interspace is localized and marked prior to sterile prep and lidocaine anesthesia.



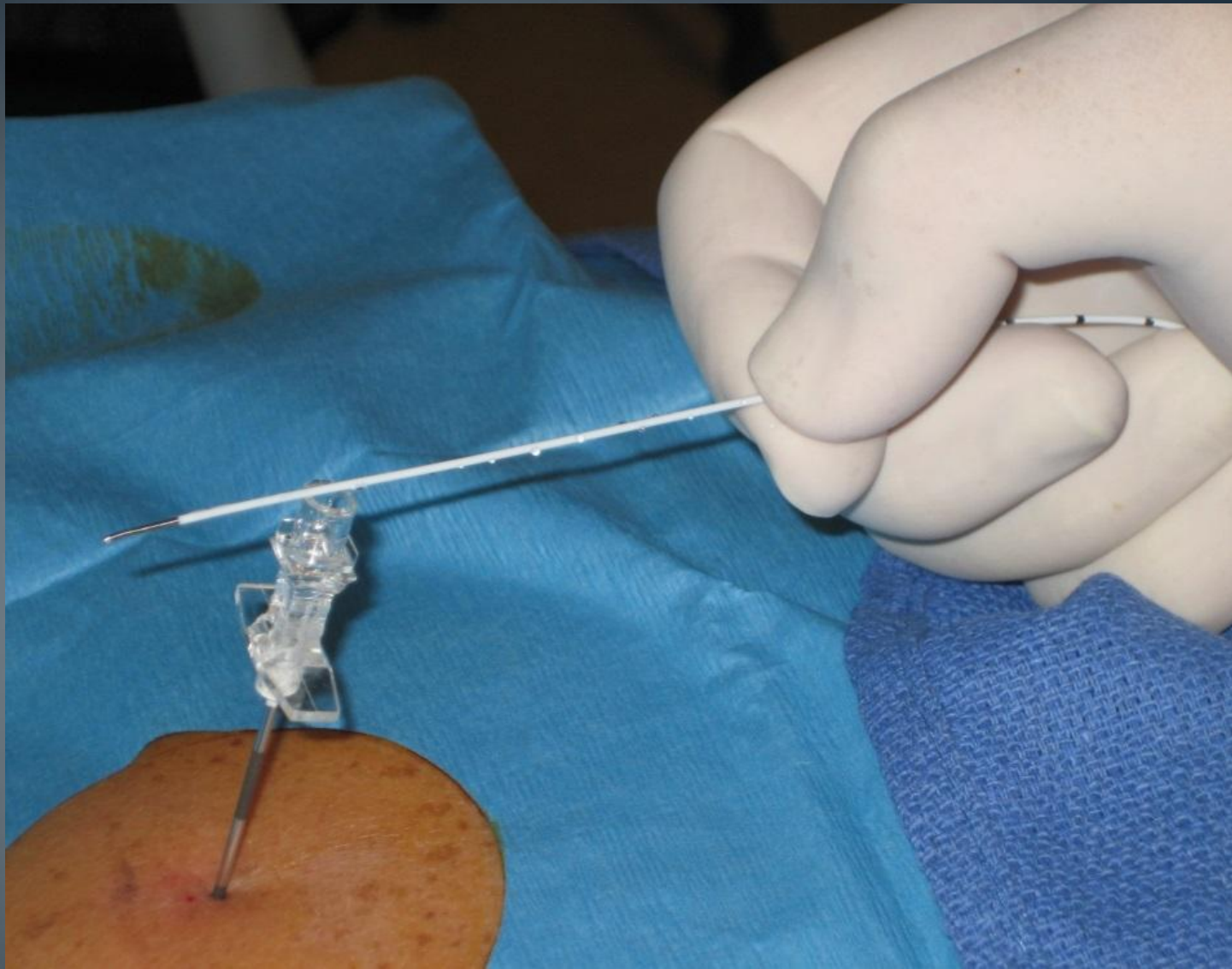
17 gauge Touhy needle is required to accept the epidural 3 French catheter. We believe the beveled, blunt tip Touhy has less potential for violation of the subdural space compared to a 22g or 25g spinal needle. There have been no dural punctures or epidural hematomas to date while utilizing the 17g needle in over 600 patients.



Loss of Resistance (LOR) Technique is utilized to advance needle under fluoroscopic guidance, while carefully keeping needle tip midline.



Position of needle in T1-T2 epidural space confirmed with 2-3 cc's Isovue-300M.



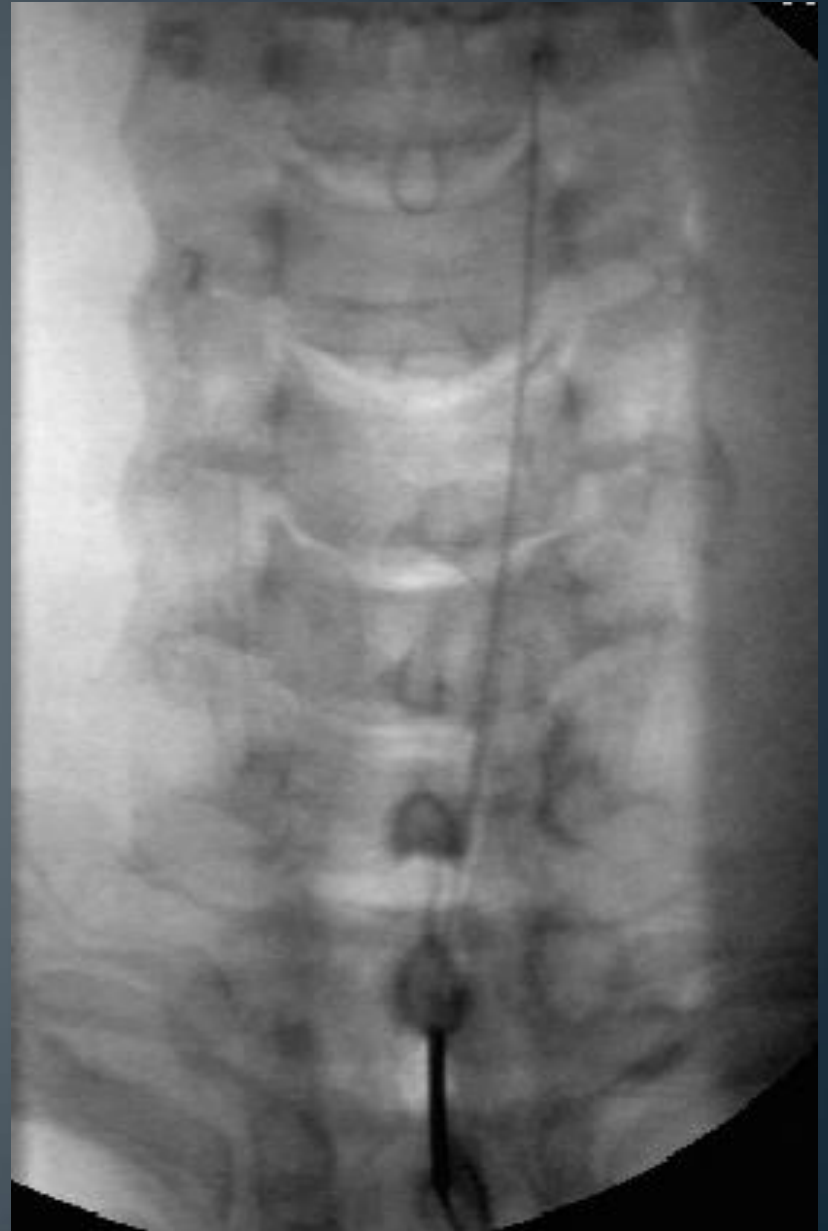
3 Fr. Epidural Microcatheter



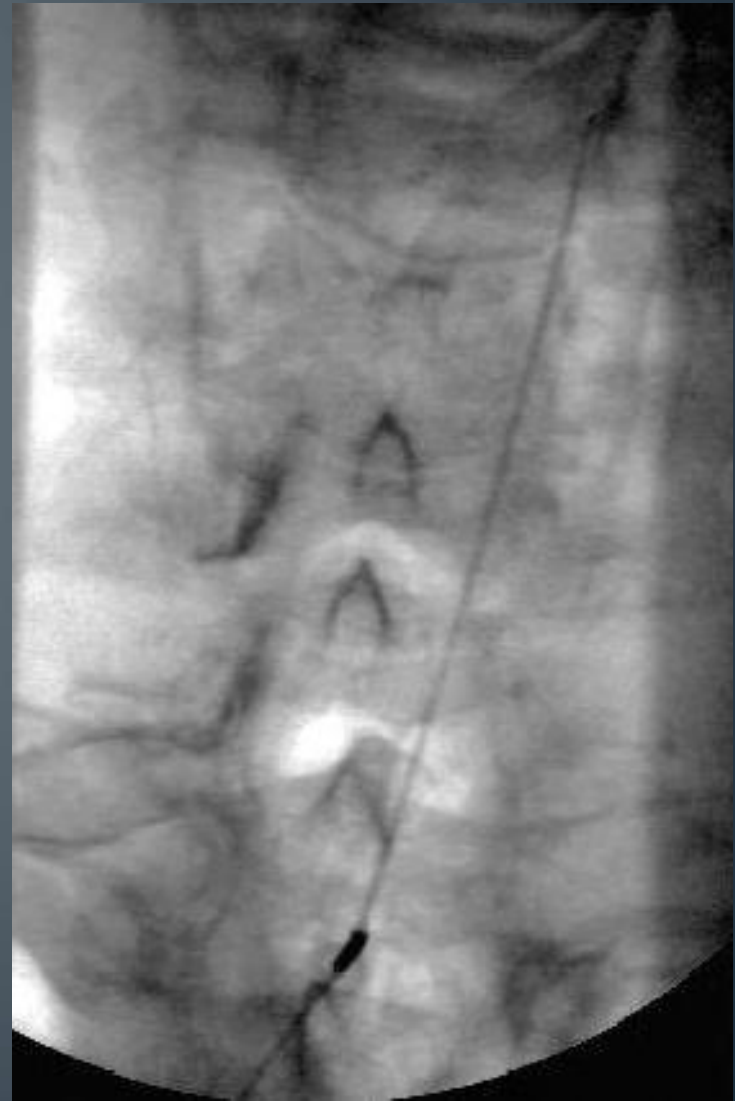
Catheter advanced into epidural space using intermittent fluoro, including lateral (swimmer's) projection, if necessary, to document position of catheter in epidural space.

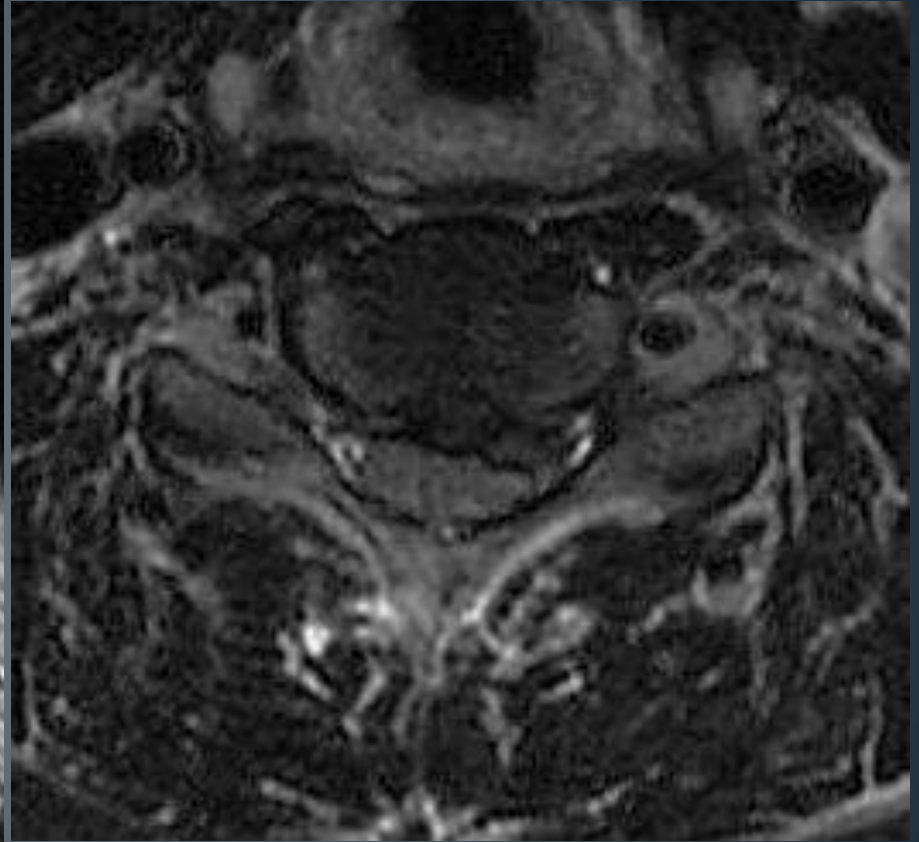
Catheter may be advanced to the C3-4 level, if necessary.

With careful manipulation, and increased experience, catheter can be “steered” right and/or left in most instances.

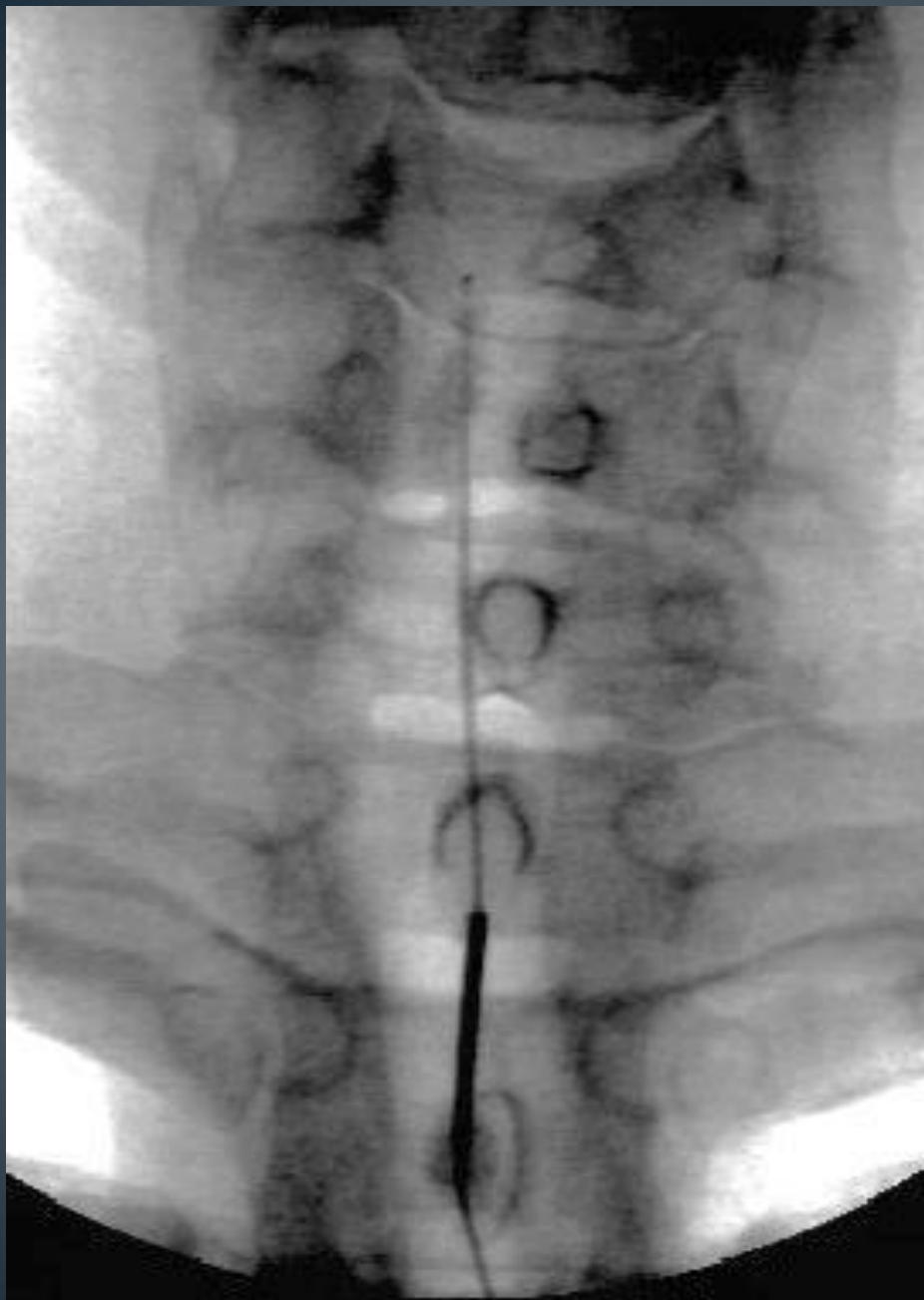


Catheter advanced left, then right, in patient with bilateral radiculopathy.





46 yr. old MRI tech with neck pain and LUE radiculopathy.



Catheter positioned at C5-C6 interspace left, close to exiting foramen prior to steroid injection.

Patient received virtually 100% relief from pain and radiculopathy; however was told by neurosurgeon that additional trauma could be devastating to cord, so fusion was performed.

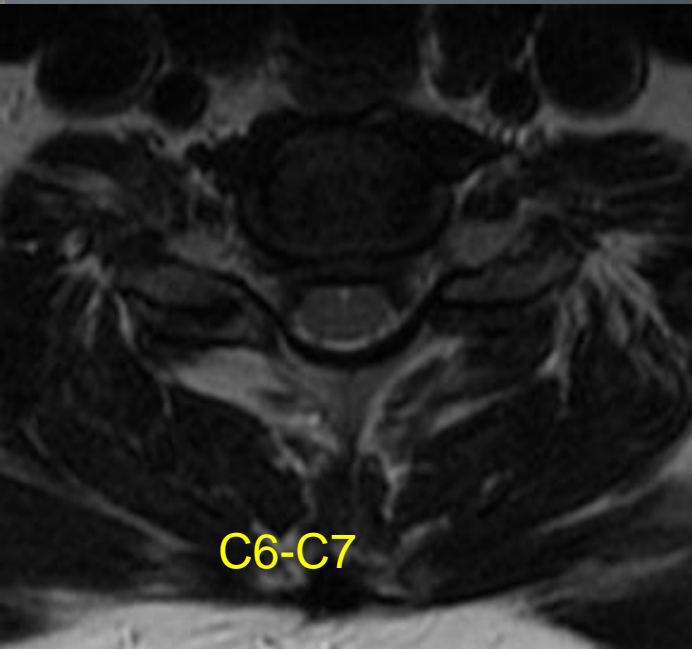
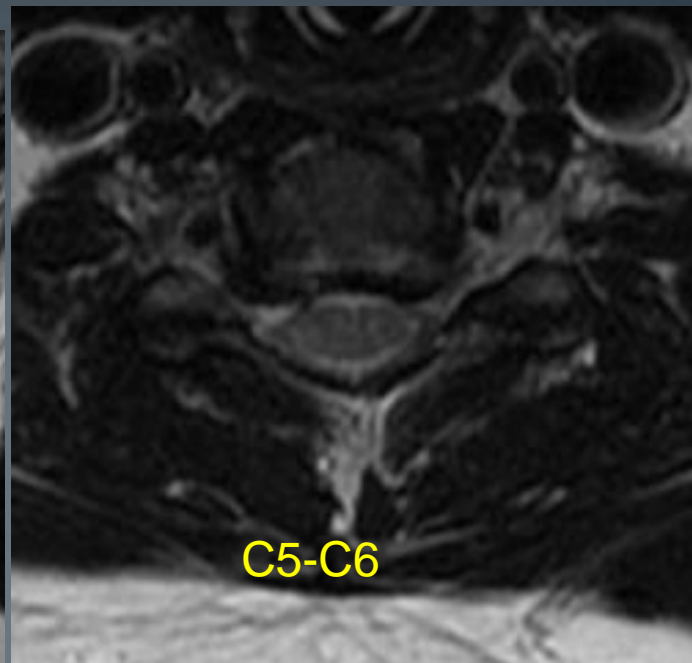
Opacification of C4-C5 exiting nerve root ? (epidural space typically ends at exiting foramen).



?



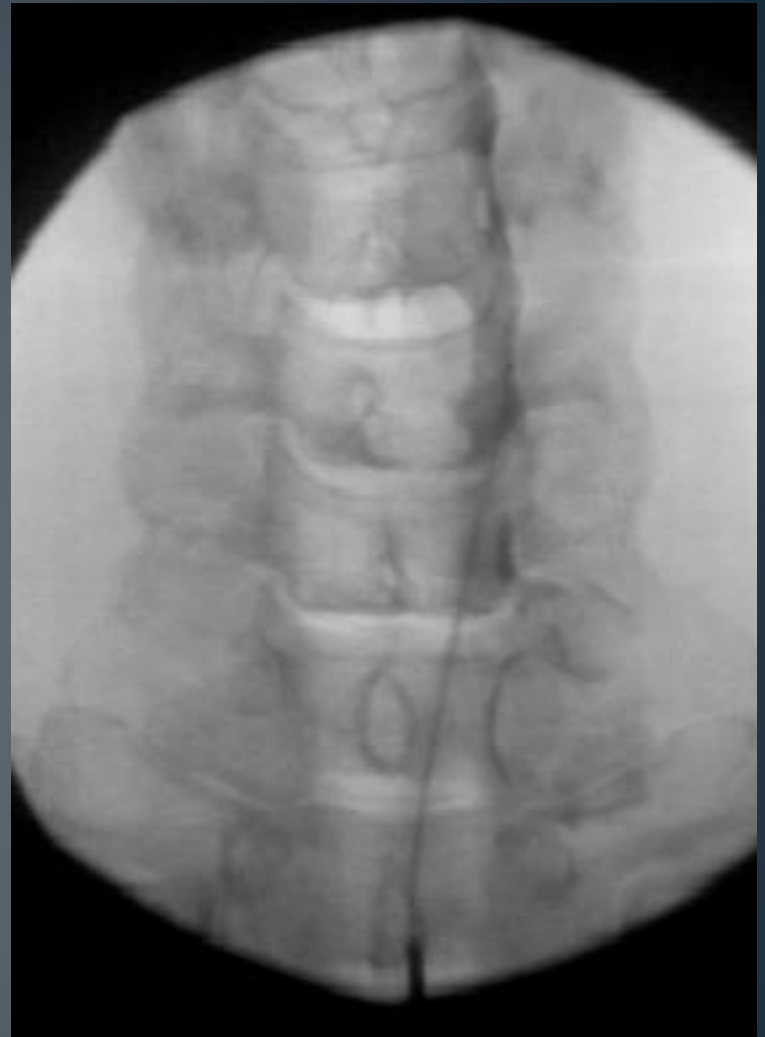
Image from literature illustrating opacification of C6-C7 nerve root via transforaminal approach.



50 year old female with neck pain and RUE radiculopathy.

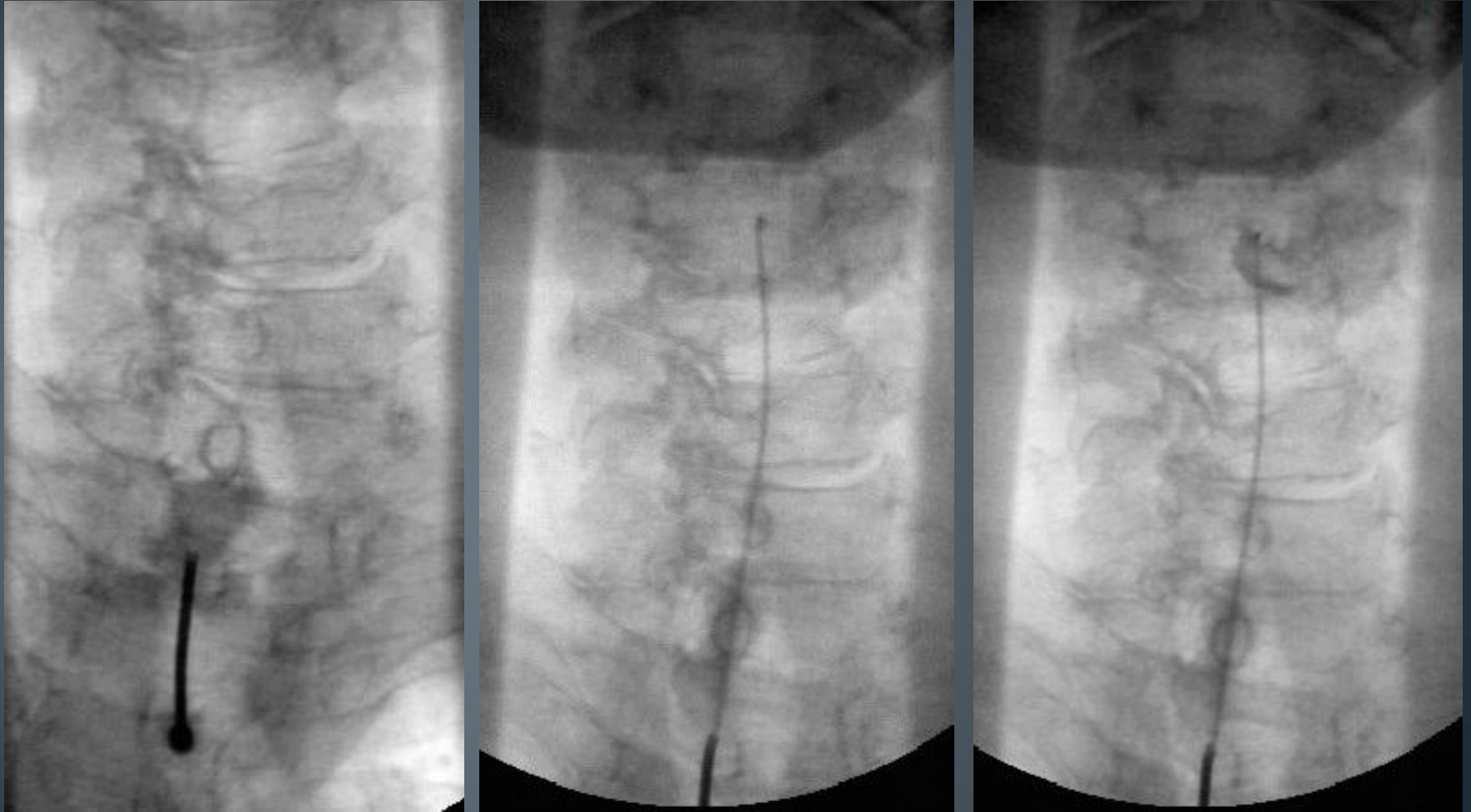


Catheter directed
above C5-C6 level,
Right.



Contrast filling right
epidural space just prior
to steroid injection.

Cervical Scoliosis ESI



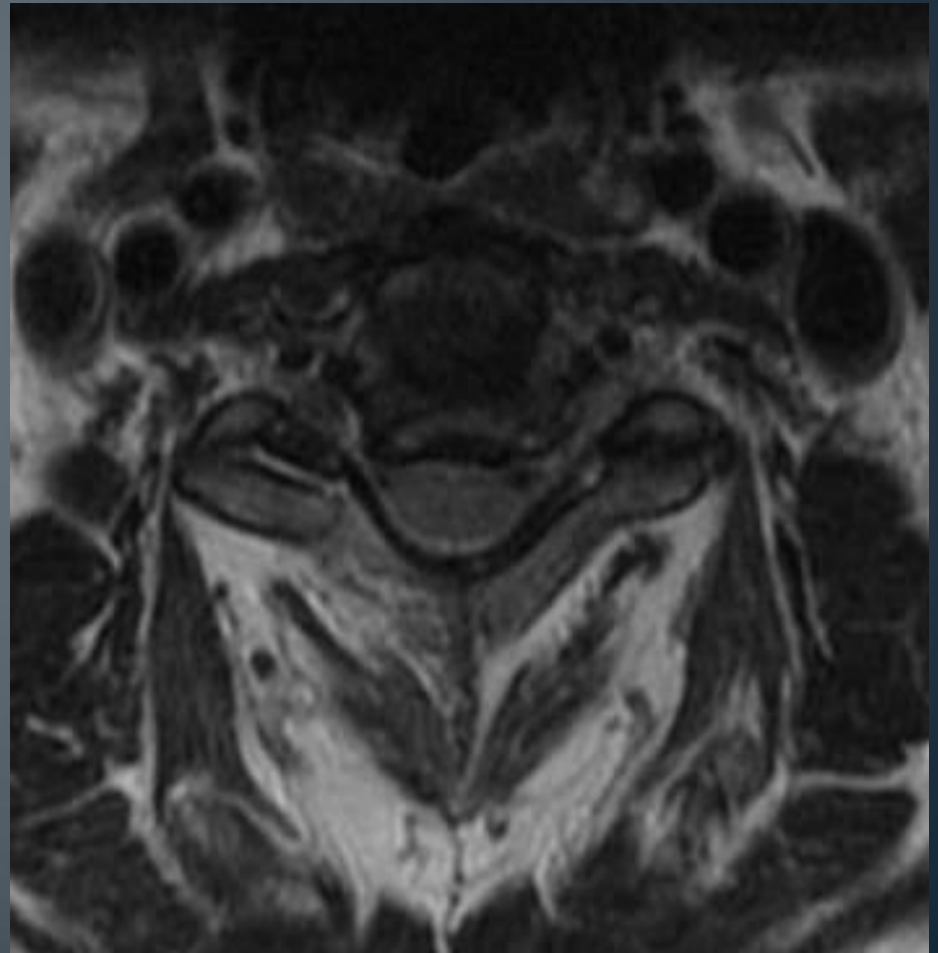
Note how catheter follows curvature of cervical spine in epidural space after entry at T1-T2.



6'4" 315 lb. rancher with neck pain and right upper extremity radicular symptoms.

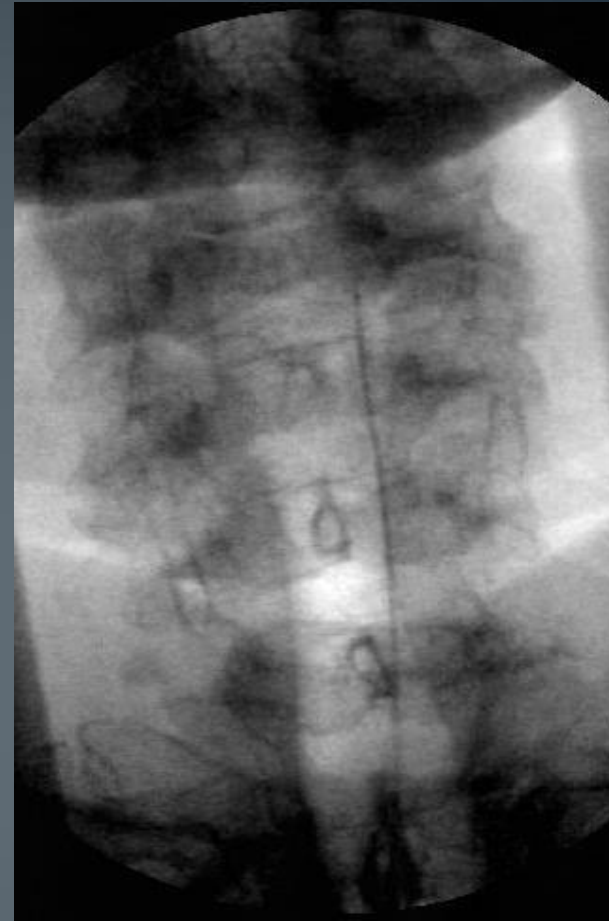


Outside MRI showing exiting foraminal stenosis at transitional C3-C4 level.



3.5 inch needle advanced to hub to reach epidural space.





Catheter advanced cephalad with contrast seen to extend toward C3-C4 right.

Patient received
80%+ relief at 10
day follow up.



Our protocol is to have the patient return at approximately 10 days post injection.

At that time, the patient is queried as to “percent relief” from prior injection.

If percentage of relief is less than 75% and/or if patient desires an additional injection, it is performed at this visit.

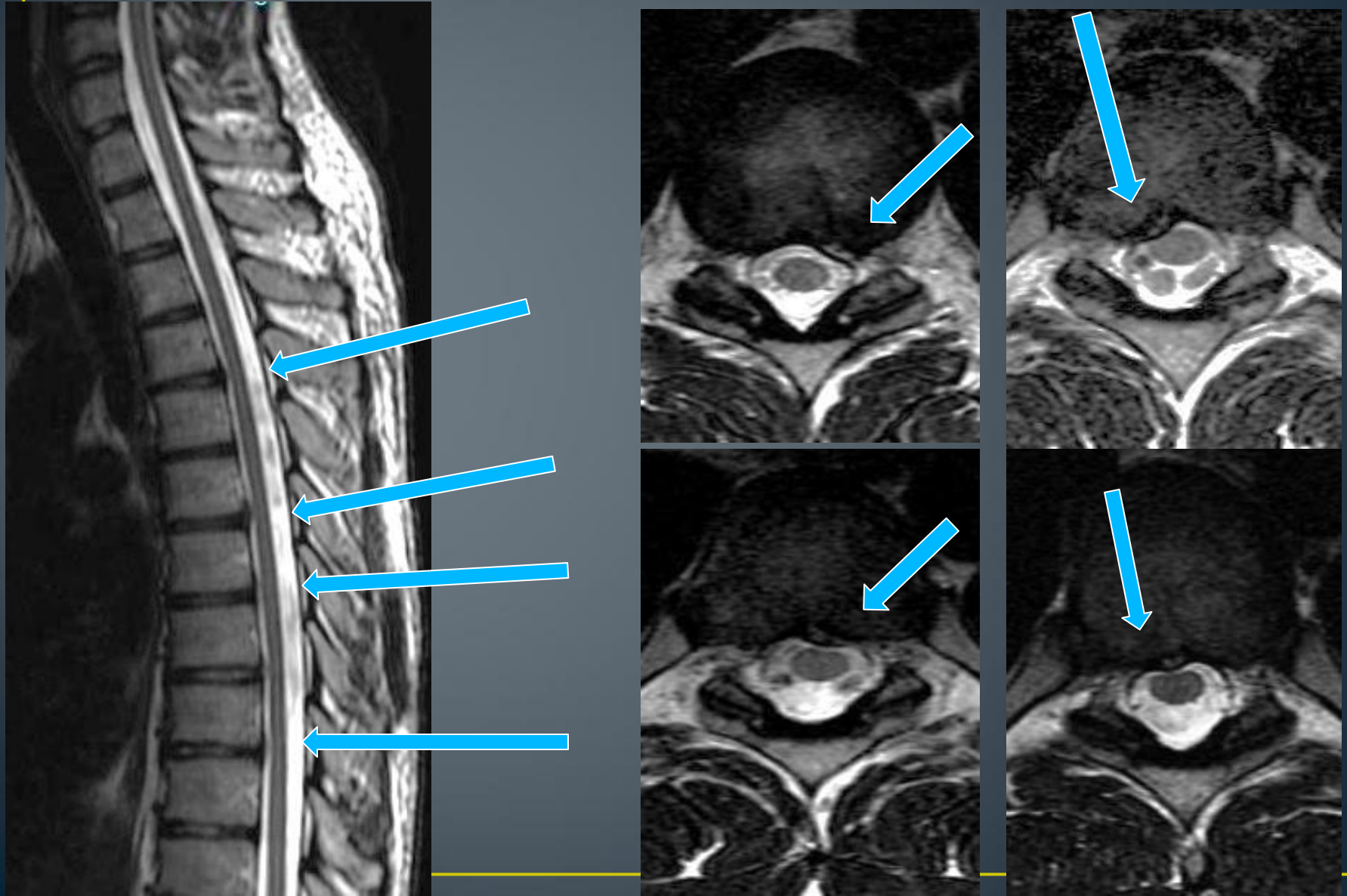
Exact statistics are pending, but generally, patients receive 75%+ relief after 1-3 injections.

Duration of relief is approximately 3-12 months.

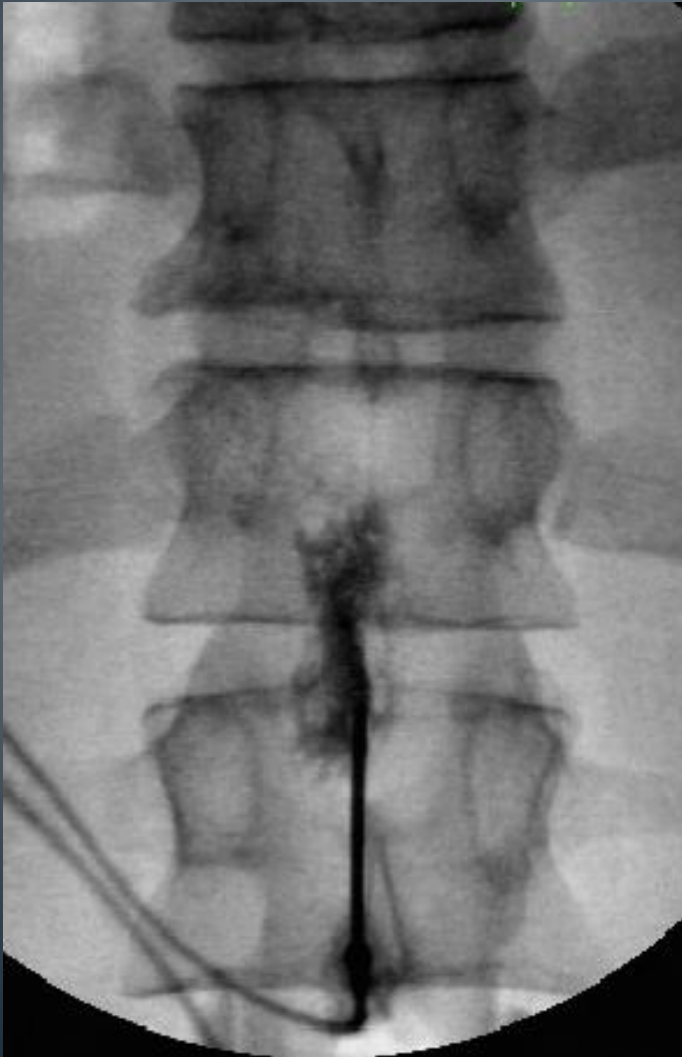
Thoracic Epidurals Injections

24 year old male post motorcycle accident approximately 4 years prior to imaging. Diffuse thoracic pain unresponsive to chiropractic manipulation, physical therapy, traction etc.

MRI showed disc protrusions at T5-T6, T7-T8, T8-T9 and T10-T11..



Contrast in epidural space at T12-L1 puncture site.

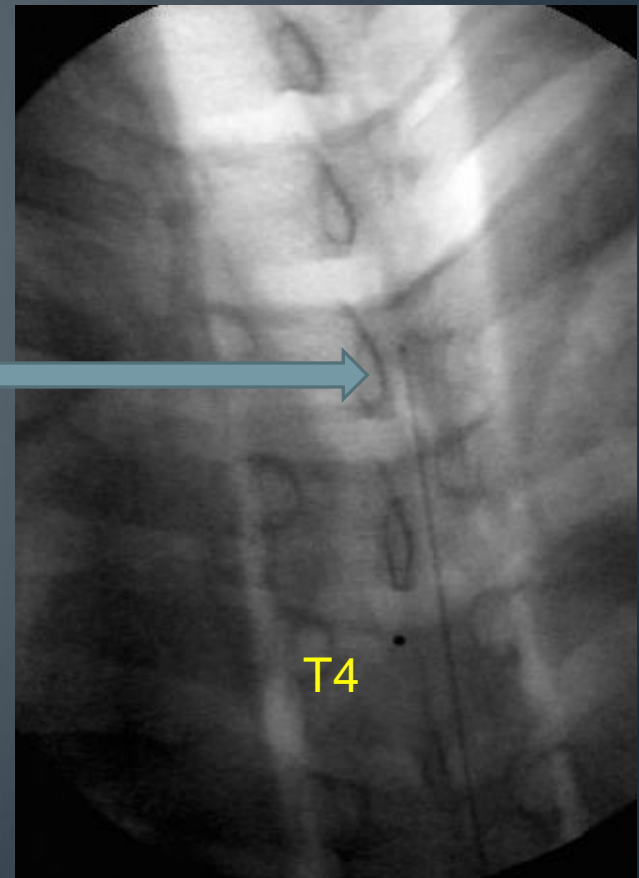
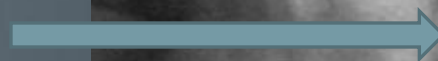


Catheter initially advanced to T2 prior to pull back for first injection at T5-T6. (BB marks top of T4).

200 mg Depo-Medrol® and 2 cc's lidocaine injected in divided doses at above levels.

At 10 days post injection, patient described 80%+ relief.

Catheter tip



T4

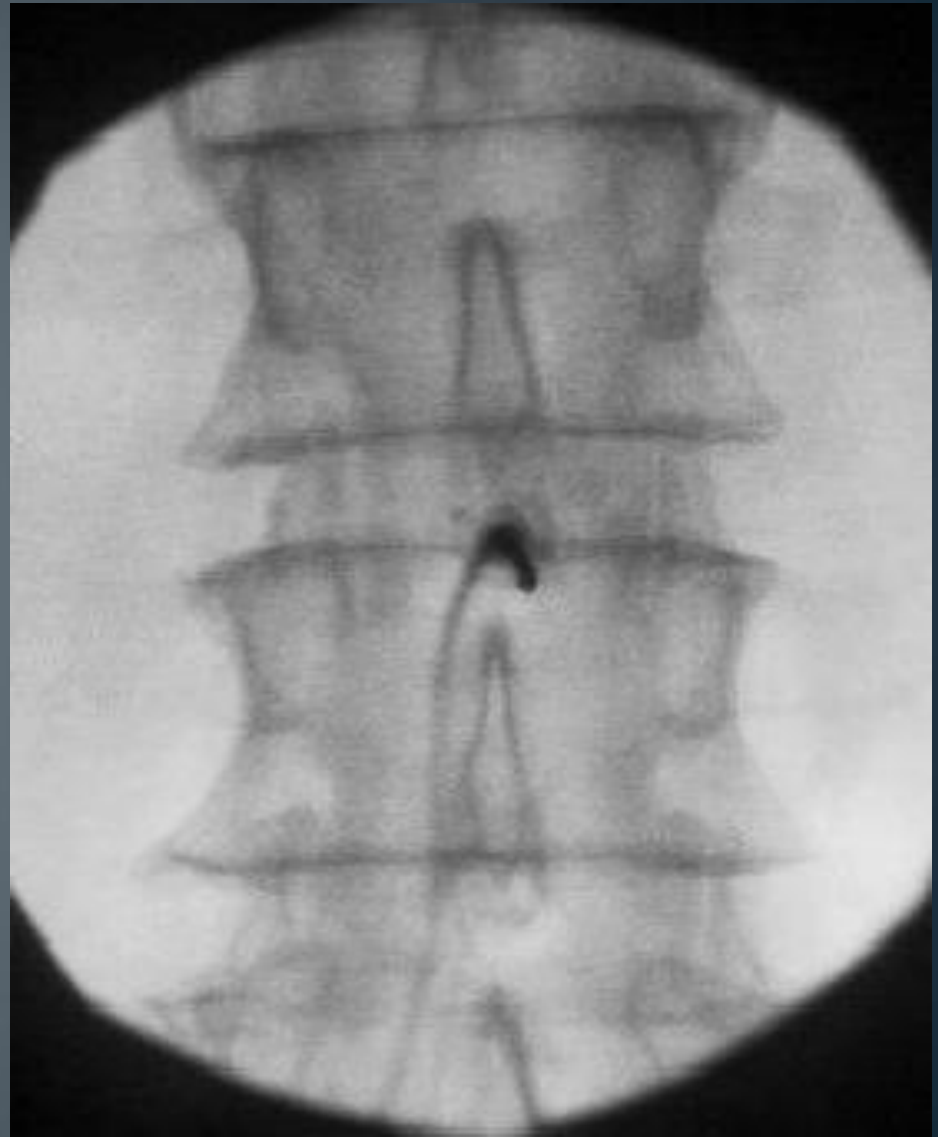
“Downhill” Lumbar Epidural Injections

Post op patient x 4 lumbar surgeries approx. 20 yrs previous, with intractable pain & radiculopathy.

Catheter directed “downhill” from L1-L2 puncture site.



Puncture site at L1-L2;
Needle bevel turned
inferiorly.



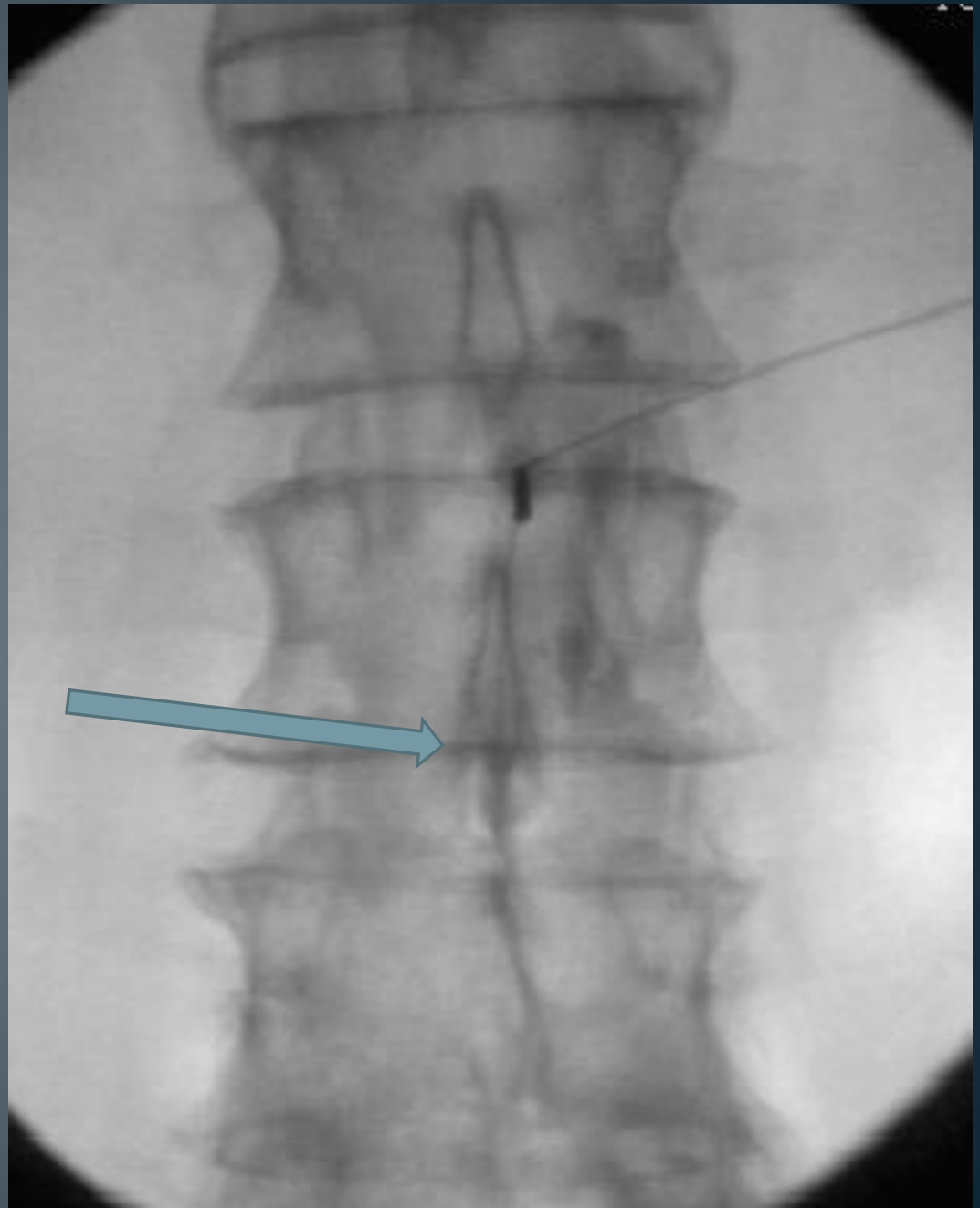
Lateral projection documents needle in epidural space.



Catheter inserted with needle bevel turned inferiorly and advanced toward L5-S1.

200 mg Depo-Medrol® injected as catheter is pulled back.

At 10 day follow up appointment, patient stated “first time pain free in 20 years”.



Can single stick microcatheter directed epidural injections potentially replace transforaminal injections, particularly in the cervical spine?

We would appreciate an opportunity to participate in a study comparing our technique to standard techniques.

Thank you for your interest!