



Musculoskeletal Imaging and Intervention Section Procedures Fluoroscopic T1-2 Transforaminal Epidural Steroid Injection

INDICATIONS

- To relieve radicular symptoms with or without neck pain from T1 nerve root irritation
- Goal: Deliver injectate to epidural space in region of the nerve root and neural foramen

RISKS

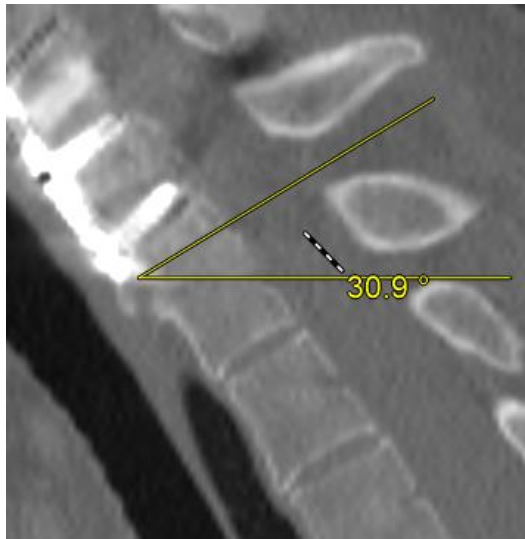
- Hematoma
- Pain
- Infection
- Injury to adjacent structures
- Pneumothorax

MATERIALS

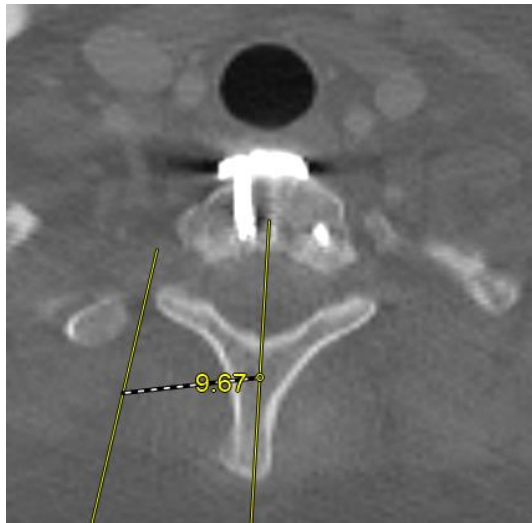
- 22G 3.5" or 6" needle
- 1% lidocaine (for skin numbing); preferably buffered with sodium bicarbonate
- Omnipaque 300
- 1% preservative-free lidocaine without epinephrine
- Dexamethasone 10mg/mL

TECHNIQUE

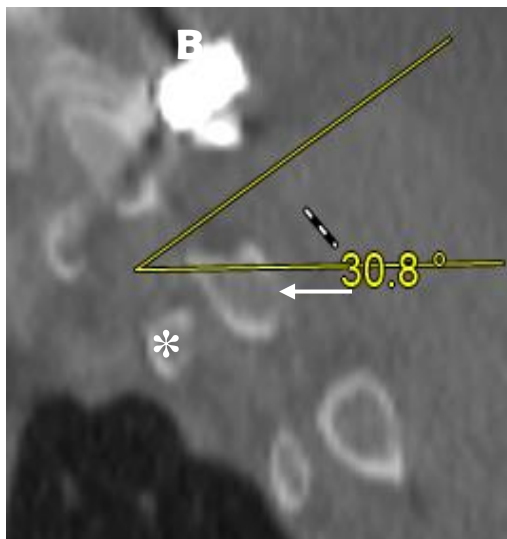
1. Review imaging.
 - a. Determine CC angle to profile T1 endplate (note this number may change slightly when patient is prone). Note: the T1-2 disc space was profiled in this case due to fusion at C7-T1.



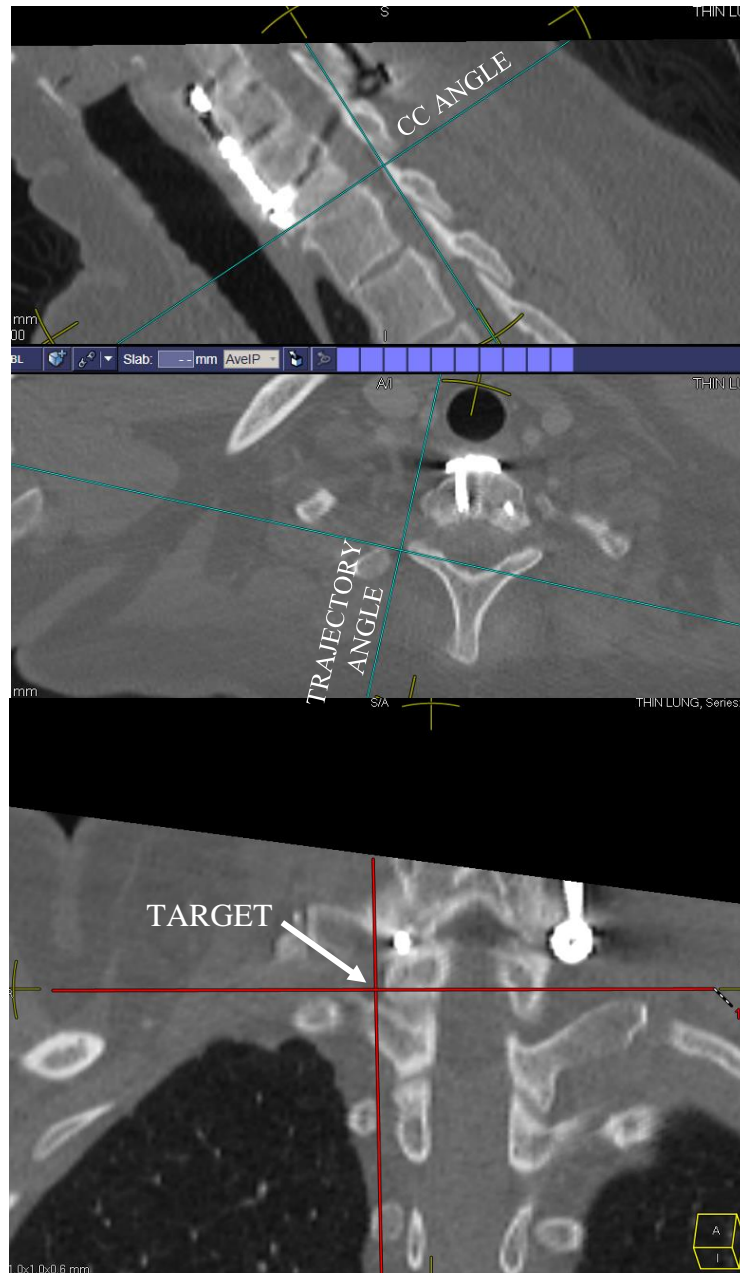
- b. Identify path unobstructed by bone that is lateral to the facet and superomedial to transverse process. This will be your needle trajectory. Measure the angle between the needle trajectory and the spinous process – this will be the ipsilateral oblique angle to set up your trajectory view (once you establish a true AP view)



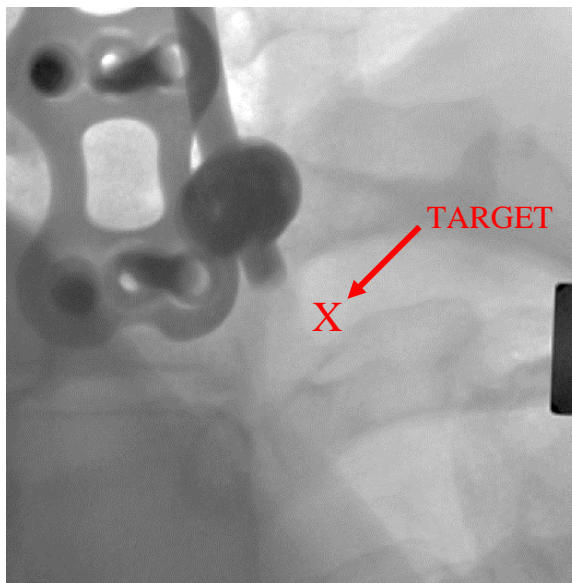
- c. Ensure your CC angle will allow your needle to clear the posterior rib (*) and transverse process (arrow) on sagittal view



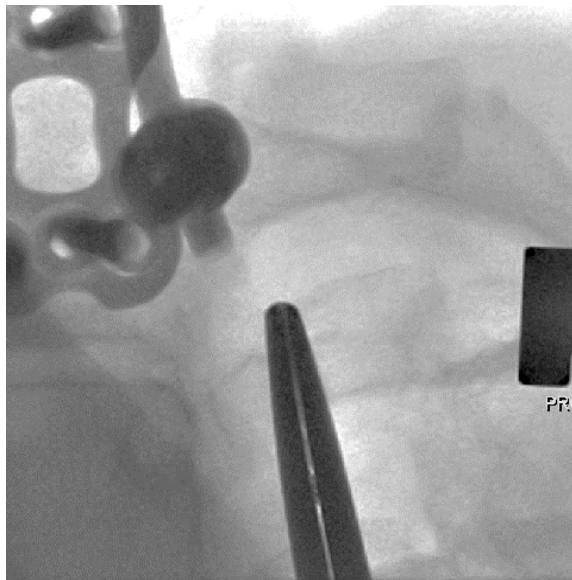
- d. With these angles measured, using the “3D/MPR Layout” function you can estimate the appearance of your target on fluoroscopy



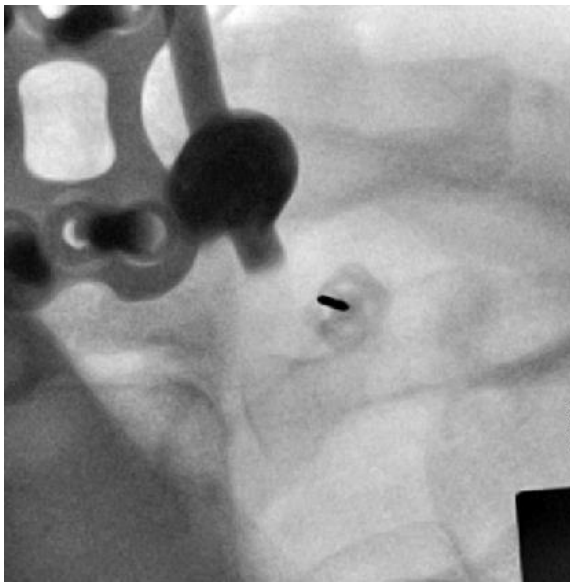
2. Place patient prone on the fluoroscopy table towel under forehead, neck in neutral position.
3. Obtain true AP view – level T1 superior endplate and center spinous process between pedicles.
4. Obtain trajectory view based on angles measured during planning. Note: images are flipped because patient is prone.



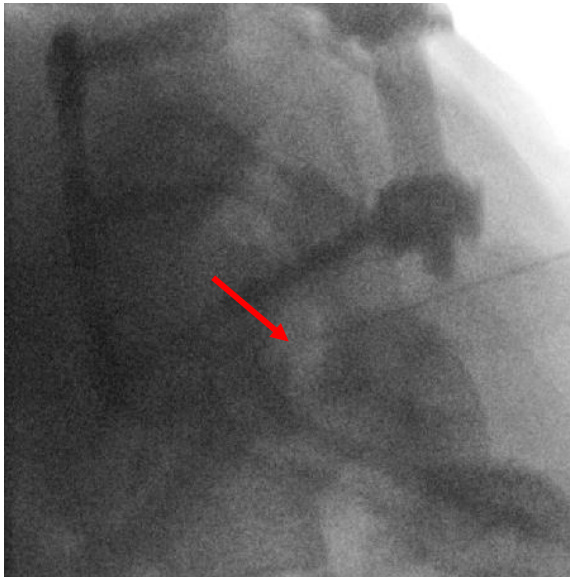
5. Mark the target between the lateral aspect of the facet and the superomedial aspect of the transverse process.



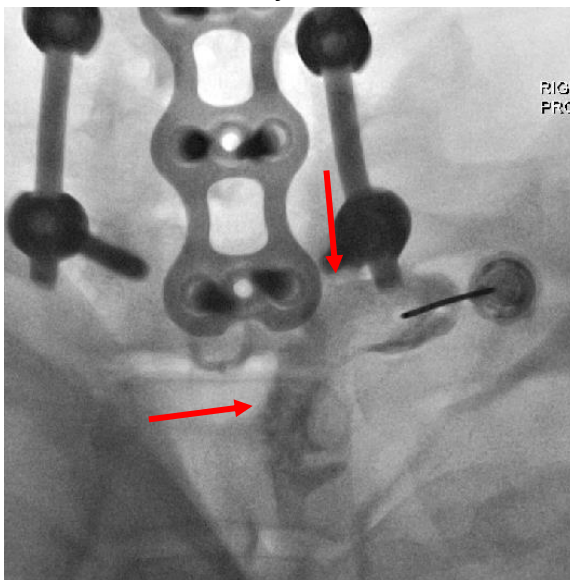
6. Prep and drape the skin. Draw up medications.
7. Inject local anesthetic.
8. Advance needle on trajectory view. Intermittently check lateral to determine depth in relation to neural foramen as well as posterior rib and transverse process.



9. Endpoints: radicular pain or needle tip at the anterior portion of the neural foramen on lateral view.



10. Inject contrast in AP and lateral views to evaluate for vascular opacification; reposition if encountered. If no blood vessels identified, medication can be injected.



POTENTIAL PITFALLS

- When planning your trajectory angle, ensure the path does not traverse the pleura. Your trajectory view will look like your needle is aiming directly for the lung. It will not get there if you plan appropriately.
- Check lateral view after marking the skin (exerting pressure on the skin with the clamp at the skin entry site) to determine whether your path will clear the posterior rib and transverse process prior to prepping.
- No epidural flow: pull back needle and advance your tip medially until you contact the lateral aspect of the facet. The bevel can then be flipped 180 degrees (notch medial) to pass just next to the bone and increase your chance of epidural contrast flow. This will also point your bevel towards the epidural space/spinal canal.
- Prominent vessels may be encountered in the anterior aspect of the foramen. With needle tip in the posterior half of the foramen, inject contrast. If epidural flow is noted, medication can be injected. If not, the needle can be advanced anterior within the foramen.

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January 21, 2021