

CERVICAL SPINAL CORD STIMULATION TRIAL FOR DEAFFERENTIATED TRIGEMINAL PAIN: A CASE SERIES AND ANATOMICAL CONSIDERATIONS

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Compassionate | Creative | Committed | Collaborative

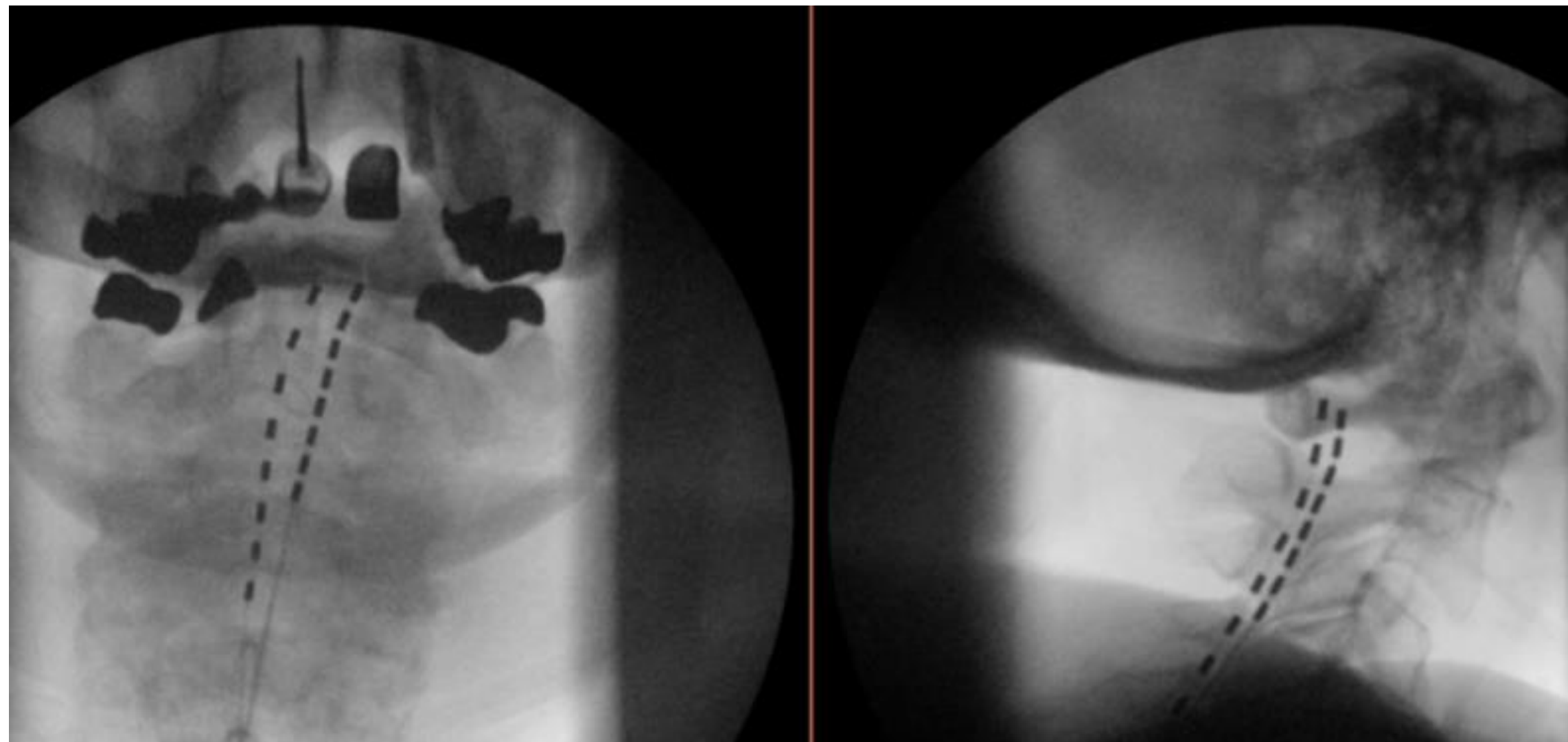
BACKGROUND

- Cervical spinal cord stimulation (cSCS) has been proposed as a treatment option for intractable trigeminal neuralgia and facial pain.¹
- There is scarce literature for the role of cSCS for facial pain with deafferentiated features or concern for complex regional pain syndrome (CRPS) of the face.
- Traditionally cSCS epidural leads are placed over the posterior column; however, the spinal trigeminal nucleus does not project to the posterior columns.
- Here we utilize a unique approach to cSCS lead placement in patients with prior therapeutic or destructive lesions who presented for intractable deafferentiated facial pain concerning for features of CRPS.

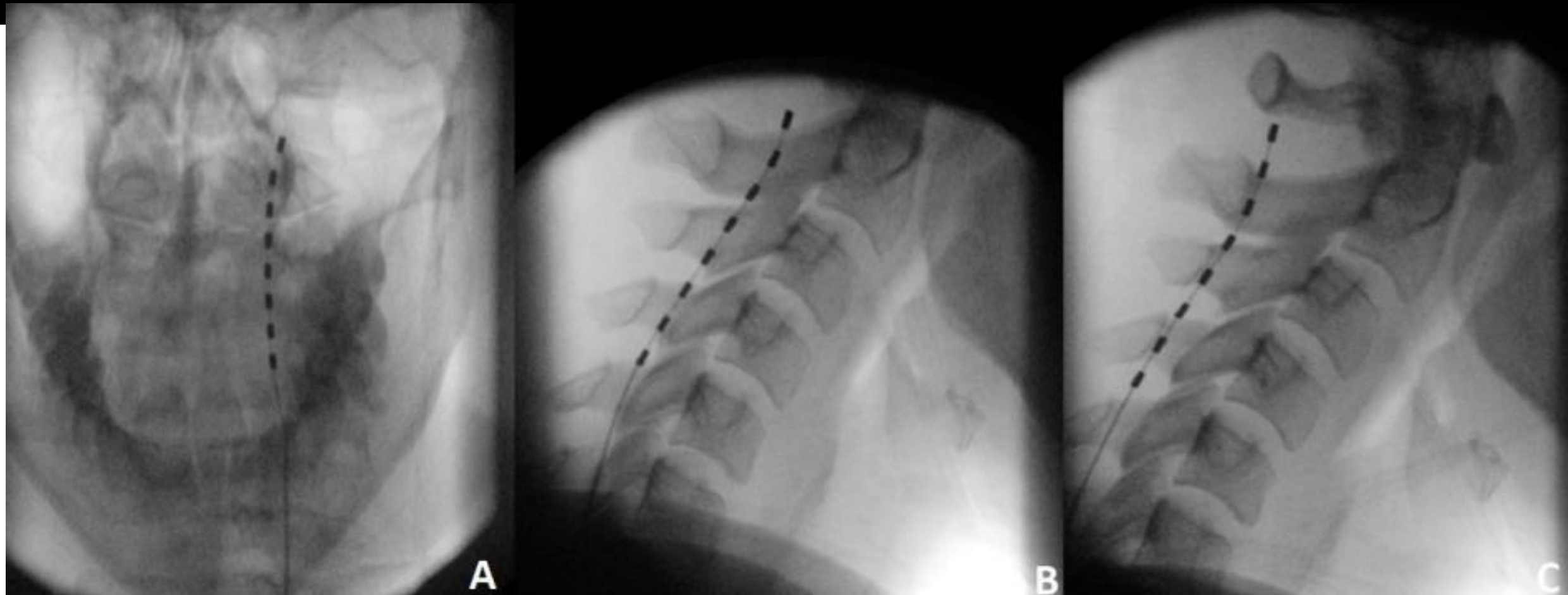
METHODS

- 11 patients with prior microvascular decompression, stereotactic radiosurgery, or destructive lesioning of the trigeminal nerve with intractable deafferentiated facial pain with features of CRPS were selected to undergo cervical SCS trial.
- Epidural access was obtained at the T1-T2 or T2-T3 interlaminar level, and leads were placed laterally on the ipsilateral side on A-P view at the C1-C2 junction near the posterior arch of C1 and 2/3 of the distance toward the midpoint of the dorsal-ventral diameter of the spinal canal on lateral view

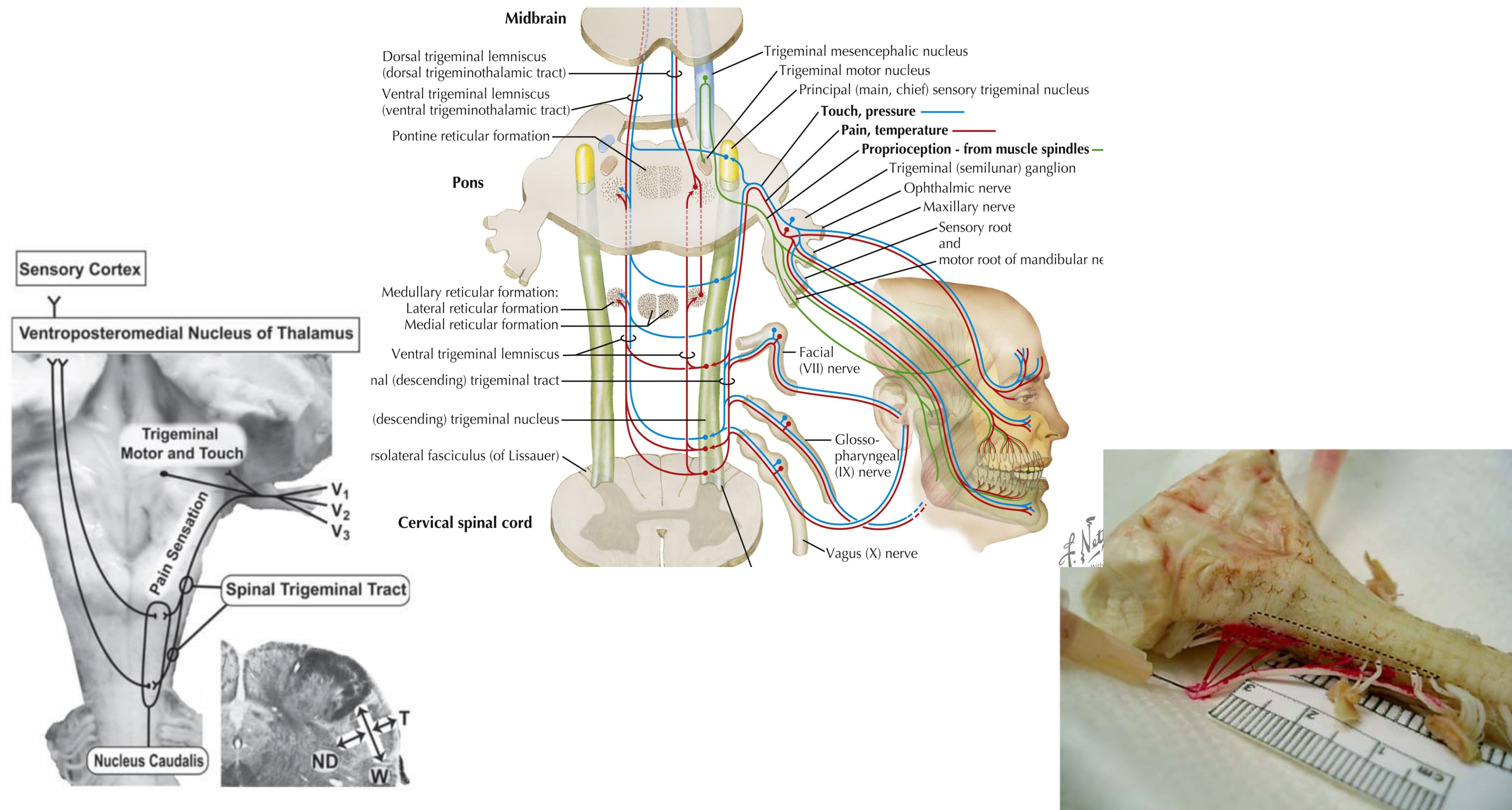
IMAGING AND ANATOMY



A: AP view on Fluoroscopic imaging of lateral lead placement
B: Lateral view on Fluoroscopic imaging of lateral lead placement



A: AP view of the proposed lead placement. B: Lateral view of proposed lead placement.
C: Lateral view of traditional lead placement over the posterior column which did not produce sensory mapping of the face.



RESULTS

- 9 of 11 patients had successful sensory mapping in the area of their pain.
- All 9 patients had >50% improvement in their pain during 7-day trial; mean improvement score = >80%, median improvement score = 85%.
- 6 patients have moved forward with permanent stimulator implant, further outcomes forthcoming.
- The three who have not yet had permanent implants had varying reasons, including: 1. fear of a surgical procedure, 2. newly diagnosed unrelated brain tumor, 3. a major eye infection requiring long term antimicrobial treatment.

DISCUSSION

- Here we demonstrate successful treatment of refractory deafferentiated trigeminal pain with unique cSCS placement.
- Traditionally, leads are placed over the posterior column, however the trigeminal nerve does not project to the posterior columns.
- Trigeminal sensory afferents conveying crude touch, pain, and temperature travel through the trigeminal nerve and descend via the spinal trigeminal tract to enter the spinal trigeminal nucleus (STN) which extends from the lateral pons to the upper cervical spine.¹
- Second order neurons cross the brain stem and ascend as the trigeminothalamic tract towards the contralateral thalamus.²
- The STN lies lateral to the dorsal columns, and medial to the dorsal spinocerebellar tract and is about 1.7mm deep and 1mm wide at the C2 nerve root level. At this level rootlets of the spinal accessory nerve exit just anterior to the C2 dorsal roots at the junction of the dorsal spinocerebellar tract and the spinal trigeminal tract³
- We found better sensory mapping and overall outcomes with the lead placed laterally as described, compared to the traditional dorsal midline lead placement.
- Moderate to severe cervical canal stenosis could be a limiting factor for a successful trial and outcomes.

REFERENCES

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