Treatment of Thoracic Interspinous Ligament Sprain with Thoracic Medial Branch Peripheral Nerve Stimulation: A Case Report

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Introduction

- Thoracic spine pain is an underrecognized source of chronic axial pain[1]
- Facet joints, intervertebral discs, and myofascial structures are commonly implicated
- The **interspinous ligament** represents a potential nociceptive pain generator[2,3]
- **Peripheral nerve stimulation (PNS)** targeting the medial branch nerves has demonstrated efficacy for chronic axial low back pain[4]
  - Not previously described for thoracic interspinous ligament injury
- We present a novel case of successful treatment using thoracic medial branch PNS

Case Presentation

History of Present Illness

- **79-year-old female** with history of osteoporosis, cerebrovascular accident, and complex inflammatory bowel disease
- **Seven months** of severe, disabling mid-thoracic axial pain following a **fall**
- Pain localized to the midline thoracic spine, approximately **T2 through T9**, with tenderness over the spinous processes
- Severe **10/10** pain
- Profound disability: **housebound**

Imaging

- CT of the thoracic spine to exclude a vertebral compression fracture: **no acute osseous abnormality**
- Thoracic MRI: mild degenerative disc disease, **patchy edema between multiple spinous processes,** most prominent at T5-6, T6-7, T8-9, and T9-10 (Figure 1)
  - Consistent with low-grade interspinous ligament strain

Imaging Findings

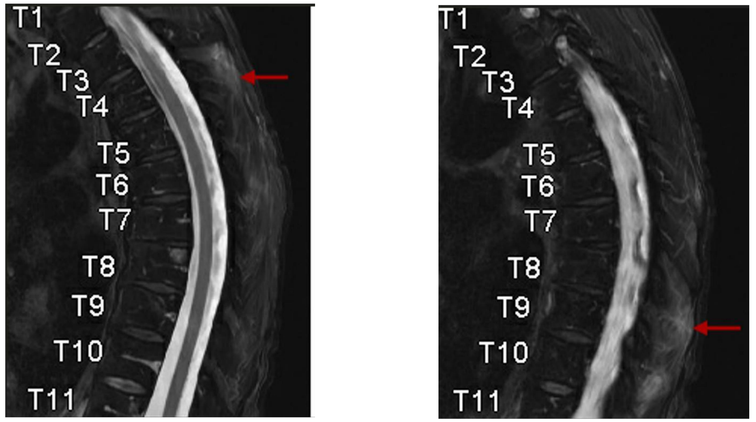


Figure 1. Sagittal T2 STIR MRI of the thoracic spine with vertebral levels labeled. Arrows mark posterior soft-tissue edema between spinous processes, consistent with interspinous ligament strain.

Treatment Course

Initial Treatment

- Interspinous ligament injections: **no improvement**
- Duloxetine 20 mg daily initiated
- Physical therapy discussed but deferred because of patient's ability to participate

Peripheral Nerve Stimulation

- Implantation of a **60-day percutaneous left thoracic medial branch nerve PNS**
- Lead was placed at the medial branch **nearest the region of maximal pain** (Figure 2)

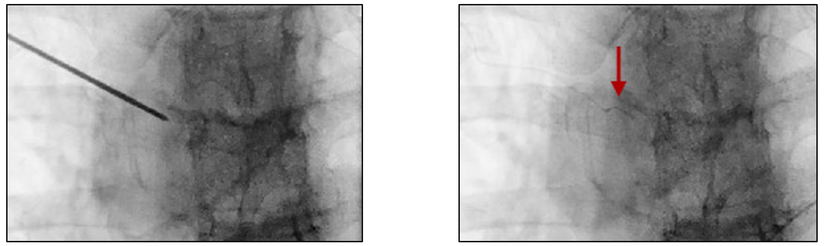


Figure 2. Fluoroscopic images of percutaneous placement of a peripheral nerve stimulation lead: introducer needle (left) and lead position (arrow, right).

Outcome

- **Immediate** improvement in pain and return to pre-injury activity (bowling, resumed all iADLs)
- 60-day follow-up and lead removal: **complete analgesia**; pain from severe baseline to **0/10**
- **Ongoing relief at 90 days**; no complications reported

Discussion

- This case demonstrates the potential utility of **thoracic medial branch PNS** for refractory pain associated with **traumatic interspinous ligament injury**
- The interspinous ligament may represent an **underrecognized contributor** to thoracic axial pain
- Current treatment options remain limited
- Thoracic medial branch PNS provided **significant analgesia** while allowing time for **ligamentous healing**
- Another demonstration of the power of neuromodulative therapies for severe chronic pain of rare etiology that cannot be studied with large clinical trials

Conclusion

Thoracic medial branch peripheral nerve stimulation may provide a treatment option for refractory axial pain associated with interspinous ligament injury.

References

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4. Gilmore CA, Desai MJ, Hopkins TJ, et al. Treatment of chronic axial back pain with 60-day percutaneous medial branch peripheral nerve stimulation: primary endpoint results from a prospective, multicenter study. Pain Pract. 2021;21(8):877-889.

Exempt from IRB review under UNMC HRPP Policy 1.8 (no patient-identifiable information); verbal informed consent obtained from patient and documented in the electronic health record.