

Authors: Luis Miguel Escano Volquez MD, Roger Haddad MD

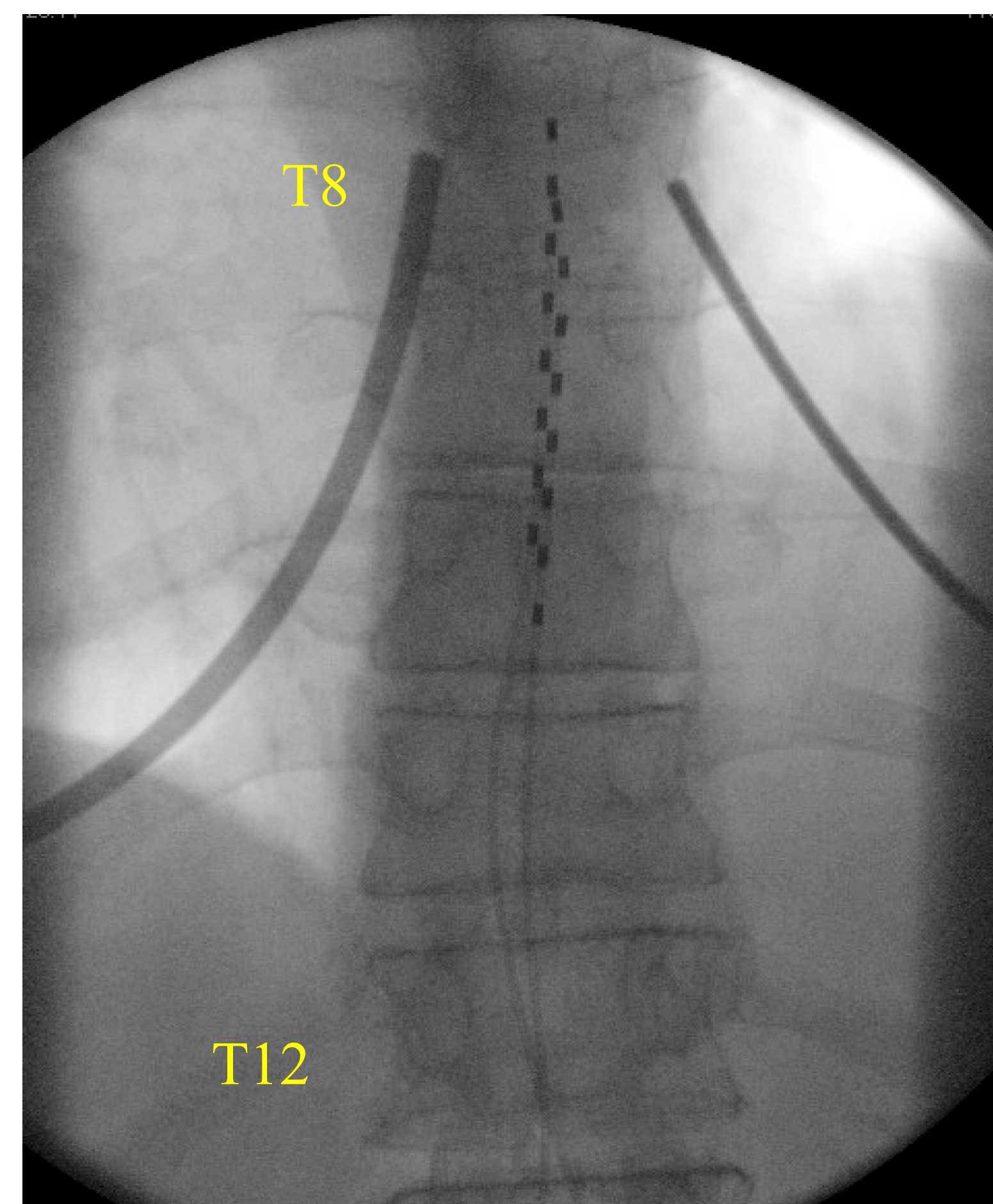
Henry Ford Health, Detroit, Michigan /Department of Anesthesiology, Pain Management & Perioperative Medicine

INTRODUCTION

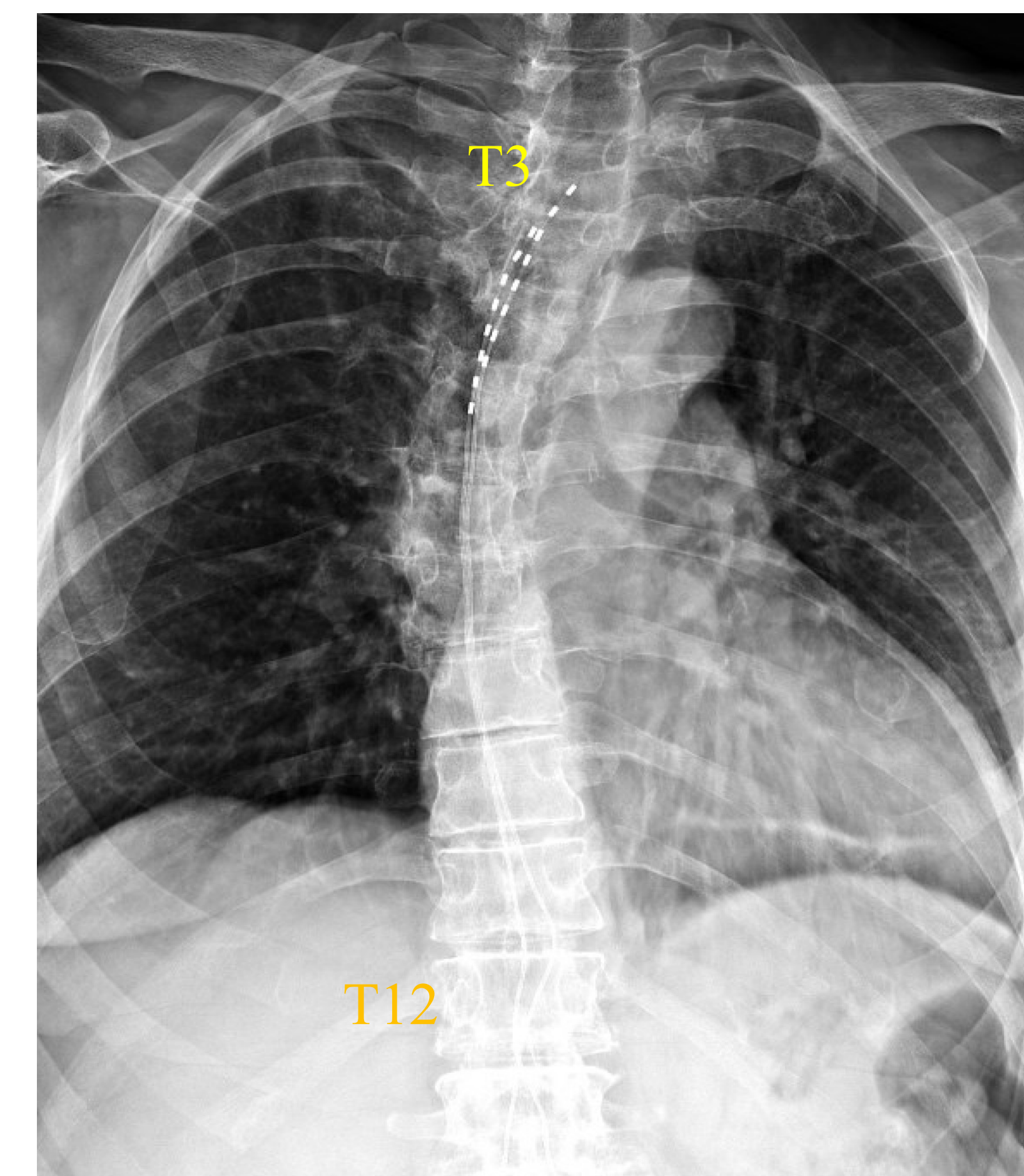
- Neuromodulation is an effective modality to treat multiple conditions.
- Complication rate can be up to 40% (**Lead migration remains the most common**)
- Mechanical stress is the primary culprit of migration.
- **Consequence:** loss of stimulation and failure of trial.
- Most of the published data document **permanent implants**
- Consequences of failed trial are detrimental to patient outcome

CASE PRESENTATION

- 69 years old female
- **PMH:** HTN, T2DM, A. Fib. Chronic low back pain, BMI:23.7
- **Allergies:** Severe allergy to adhesives
- August 2020 – Trial lead placement.
 - Access: T12-L1 x2
 - Lead placement: T8 and T9
- **Lead securing:** Tegaderm, tension relieving loops, paper tape applied over loops.
- **No firm adhesive tape (Stayfix)** used.
- **Trial day #2:** No relief reported. Patient advised to present to the clinic again for evaluation.
- Thoracic x-ray performed showing **lead migration to T3 level.**
- Lead was pulled back down to T8 level and four extra days of trial were offered.
- <10% relief at **trial day #7.**



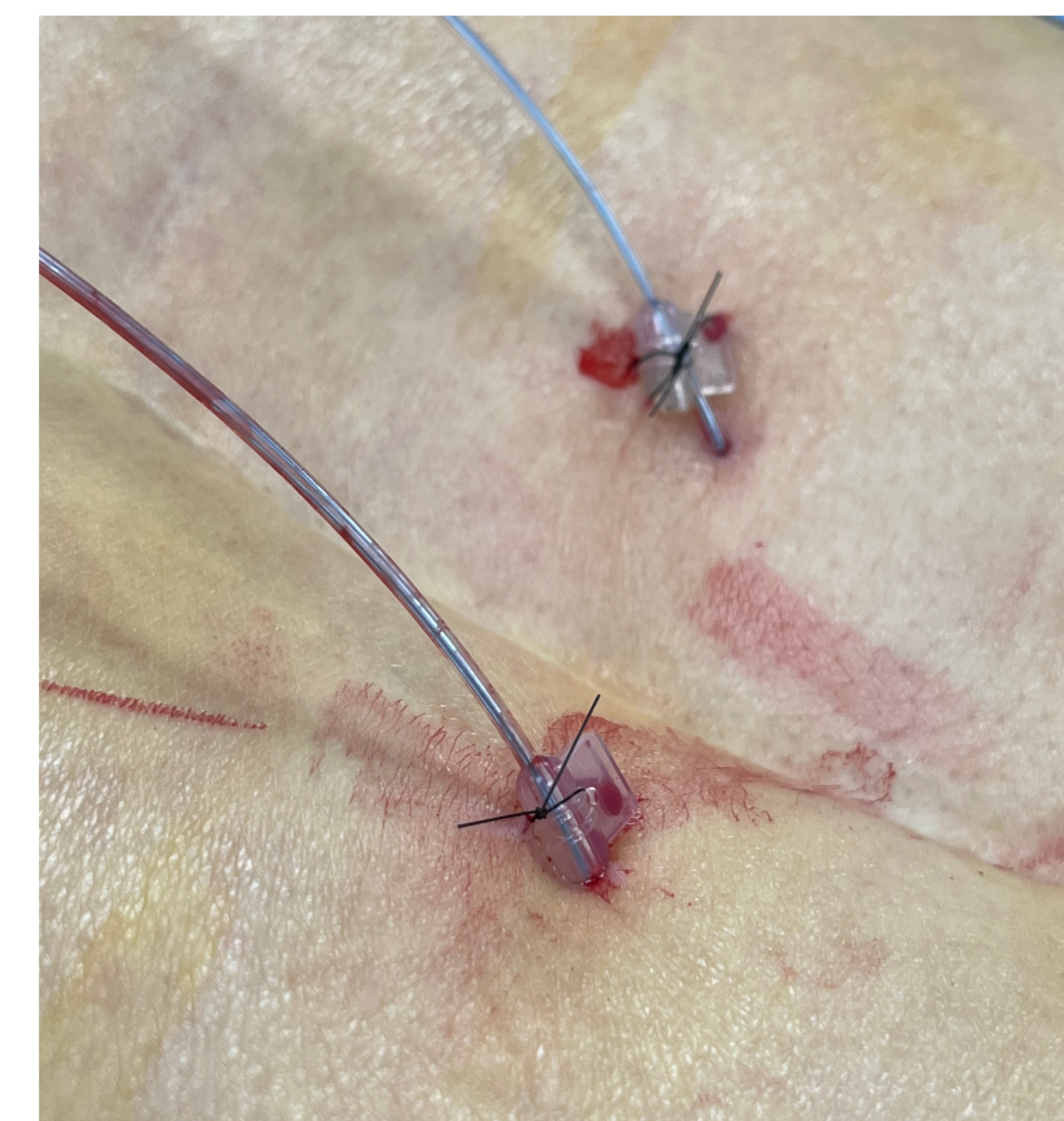
Picture #1. Initial placement of SCS trial leads with the superior lead at T8



Picture #2. X-ray obtained at trial day #3. Showing cephalad migration to T3



Picture #3. Latera. Thoracic spine x-ray showing persistent posterior location of SCS leads.



Picture #4. Potential anchoring solution for patients with adhesive allergy

DISCUSSION

- Lead migration continues to be the most common complication for trials and permanent implants (1.5-44%)
- Not many studies documenting migration rate for trials
- Many are missed due to lack of F/U x-rays
- Cephalad migrations is **rare**
- Multifactorial in origin:
 - Repetitive, vigorous movement
 - Low BMI
 - Anatomical reasons: levoconvex scoliosis in the patient, lumbarized S1
 - No Stayfix or sutures used
 - Negative pressure of epidural space

CONCLUSION

- The vast majority of lead migration cases are caudad, cephalad migration is rarely encountered.
- **Multiple factors** may have played a role
- Study of the mechanism and potential alternatives for securing the lead is important.

REFERENCES

1. Johannes CB, Le TK, Zhou X, et al. The prevalence of chronic pain in United States adults: results of an Internet-based survey. J Pain 2010;11:1230–9
2. Kumar K, Taylor RS, Jacques L, Eldabe S, Meglio M, Molet J, Thomson S, O'Callaghan J, Eisenberg E, Milbouw G, Buchser E, Fortini G, Richardson J, North RB. The effects of spinal cord stimulation in neuropathic pain are sustained: A 24-month follow-up of the prospective randomized controlled multicenter trial of the effectiveness of spinal cord stimulation. Neurosurgery 2008; 63:762-770
3. Bell GK, Kidd D, North RB. Cost-effectiveness analysis of spinal cord stimulation in treatment of failed back surgery syndrome. J Pain Symptom Manage 1997; 13:286-295.
4. Kemler MA, de Vet HC, Barendse GA, van den Wildenberg FA, van KM. Effect of spinal cord stimulation for chronic complex regional pain syndrome Type I: Five-year final follow-up of patients in a randomized controlled trial. J Neurosurg 2008; 108:292-298
5. Kumar K, Taylor RS, Jacques L, Eldabe S, Meglio M, Molet J, Thomson S, O'Callaghan J, Eisenberg E, Milbouw G, Buchser E, Fortini G, Richardson J, North RB. Spinal cord stimulation versus conventional medical management for neuropathic pain: A multicentre randomised controlled trial in patients with failed back surgery syndrome. Pain 2007; 132:179-188.