

Background

In patients with non-small-cell lung cancer, resectable tumors can range from stage I to stage IIIA, and surgery is the mainstay of therapy for such tumors.¹

- Today, thoracotomy and video-assisted thoracotomy are surgical options.

Post thoracotomy neuralgia (PTN) is defined as pain that recurs or persists along a thoracotomy incision at least two months following the surgical procedure.²

- Described as dysesthetic burning and aching, often with lancinating pain away from the incision site, which suggests damage to an intercostal nerve.
- According to Maguire et al., neuropathic symptoms associated with PTN produce significantly more severe pain, more analgesia use, and pain more likely to limit daily activities.³
- Per our review, 9 patients have undergone spinal cord stimulation (SCS) for PTN; of these, 5 patients have experienced long-term amelioration of symptoms.^{4,5}

Case Report

A 58-year old Caucasian woman described sharp jabbing pain along the course of a right rib below her breast.

- Pain was exacerbated with breathing, coughing, and arm movements. The patient was sleep deprived.
- Adequate pain relief was not provided by a regimen of oxycodone, lidocaine patch 5%, and gabapentin.
 - Visual analog pain scale (VAS) rating: 7-9/10.

3-months previously, the patient underwent a thoracotomy with lobectomy [right upper lobe]. Squamous cell carcinoma was identified in the extracted lung- and visceral pleural-tissue; the hilar lymph nodes were negative for metastatic infiltrate.

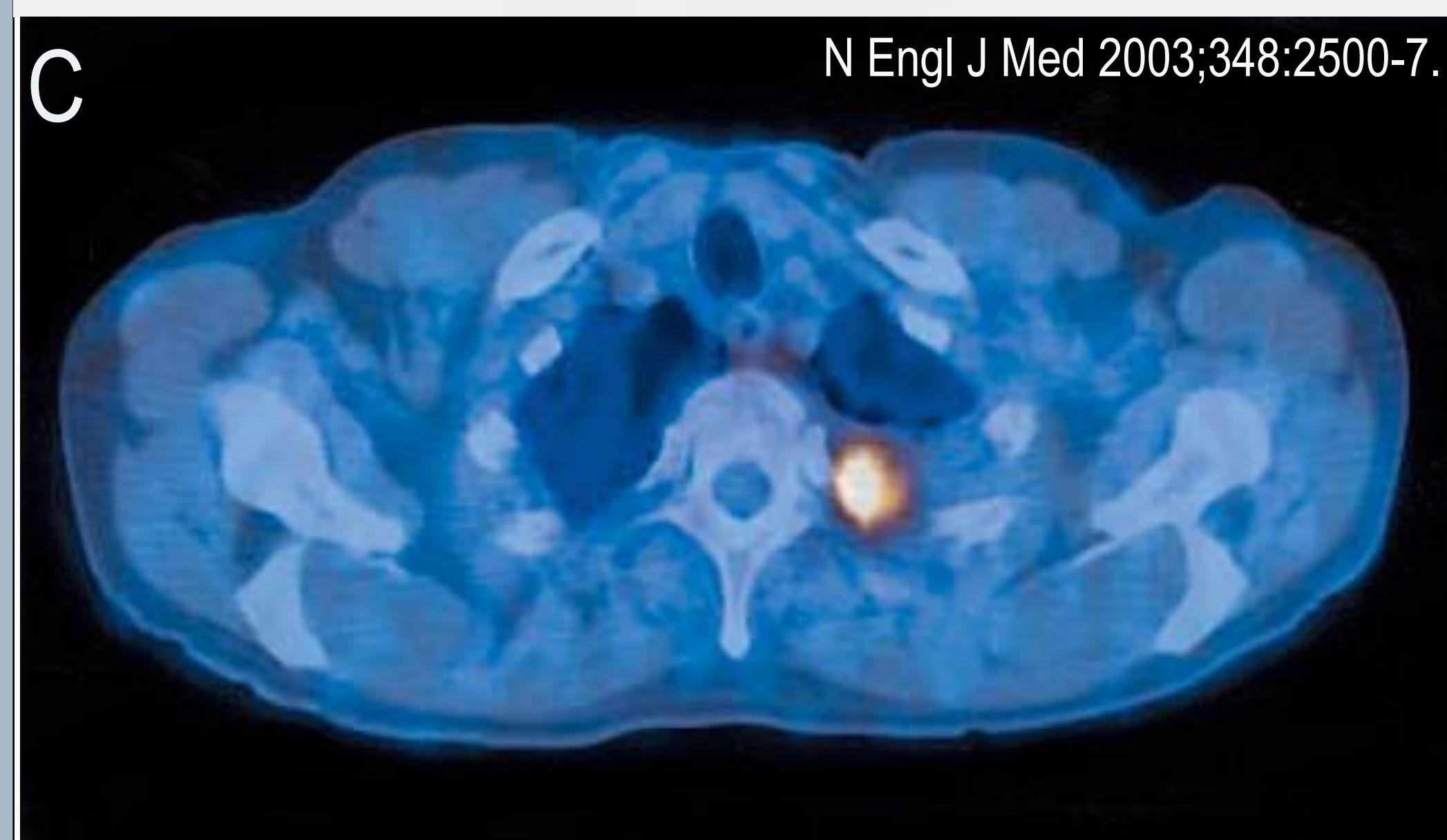
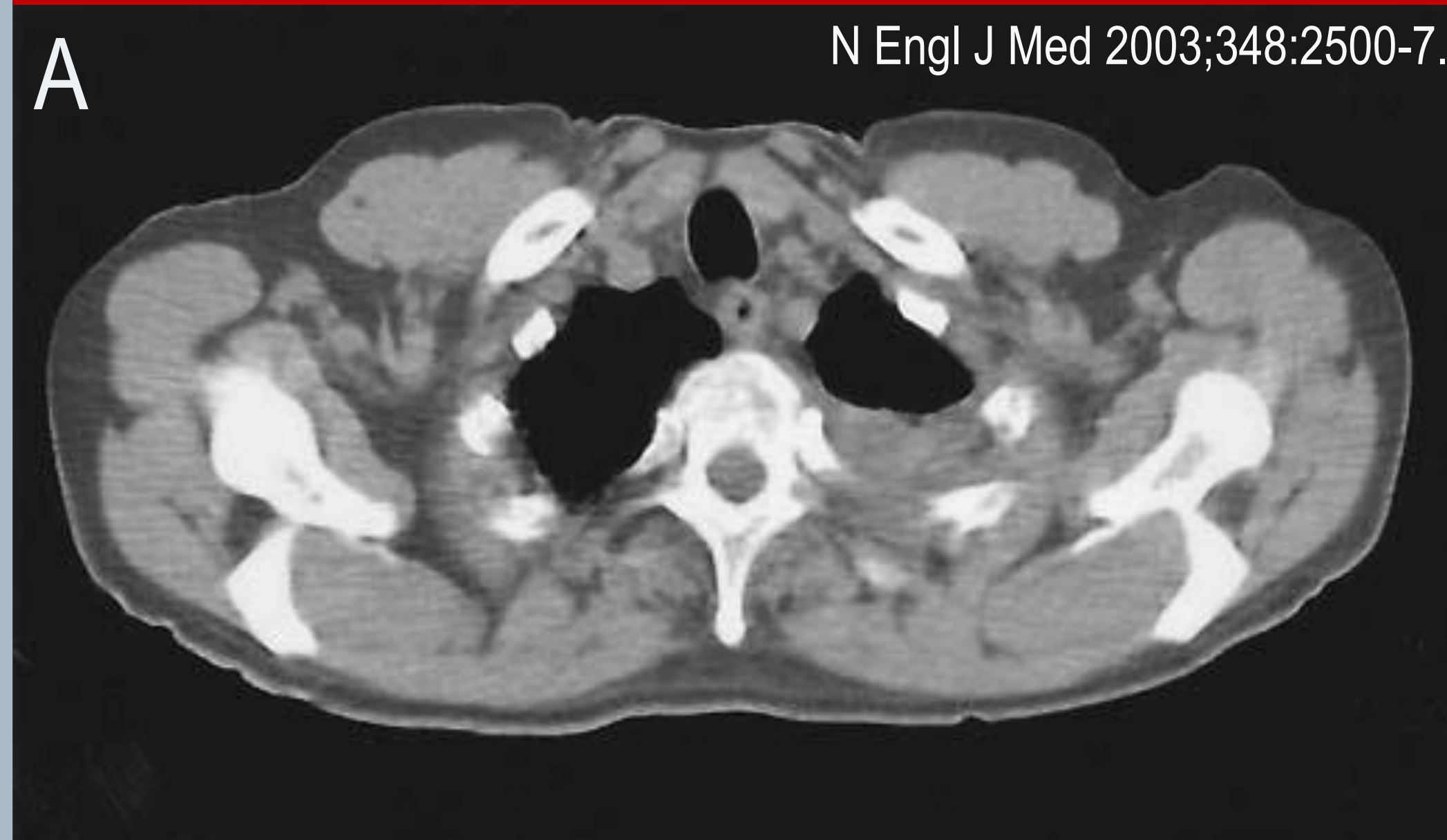
- Note: thoracotomy with wedge excision [right upper lobe] for necrotizing granuloma was performed 5-years earlier.

Epidural injections (transforaminal approach) abated her pain; however, the benefits were short-lived.

We suggested a SCS trial to attempt: 1) substantial reduction of pain; 2) decreased use of analgesics; and 3) improved sleep patterns. However, postoperative/adjuvant radiotherapy was implemented, after a “baseline” PET/CT scan, and the trial was postponed.

- We proceeded with the SCS trial following completion of the radiation treatments.

Coregistration: PET/CT fusion imaging



A: CT scan; B: PET scan depicts metabolic activity; C: fusion imaging shows anatomic location of radionuclide uptake in panel B.

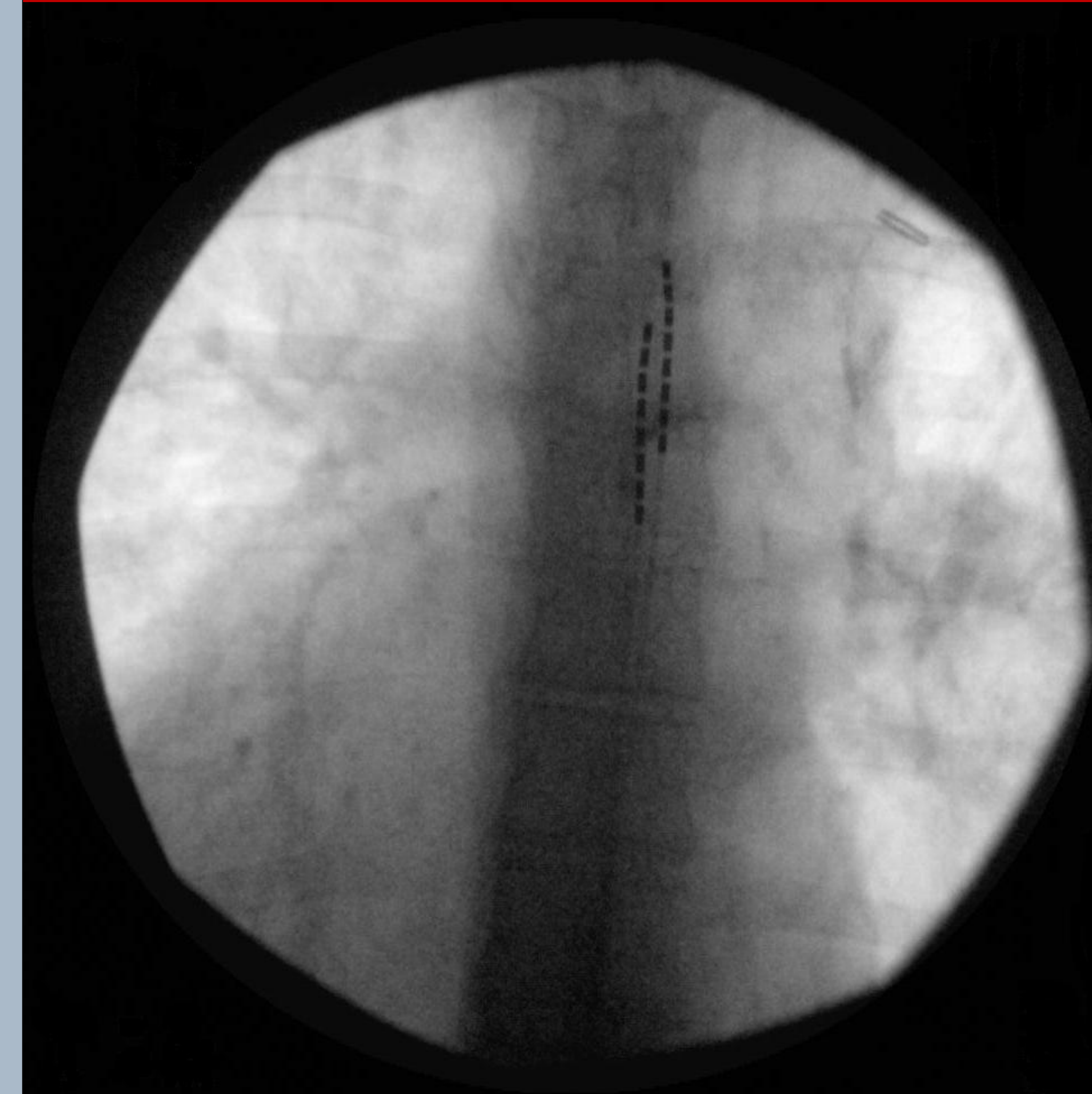
Outcomes

Following a successful trial, the SCS system was implanted.

Outcomes: 9-months postimplant:

1. 75% pain relief, VAS 1-2/10 without analgesics;
2. Improved ability to perform upper body movements;
3. Return of normalized patterns of sleep; and
4. Overall improvement in quality of life, appreciated by the ability to breathe with less discomfort.

Implant procedure



Dual 1x8 Linear™ leads (T6-T7 vertebral levels)
Boston Scientific Neuromodulation,
Valencia, CA, USA

Discussion

Our decision to proceed with neurostimulation in PTN was facilitated by our experiences using SCS to capture chronic benign low back pain for post laminectomy syndrome.

- We find it notable that many of the pain attributes associated with failed back surgery (i.e., neuropathic pain characteristics) are similarly present in PTN.

All references to SCS to treat PTN presented in the literature are mentioned in the broader context of case compilations, with no mention of the underlying disease states—leading up to thoracic surgery—in relation to outcomes.^{4,5}

- However, the report presented here provides a detailed assessment of SCS in the treatment of PTN.

Interestingly, to the best of our knowledge, SCS has only been employed twice for patients with lung cancer—although in each case, the targeted pain was unrelated to thoracotomy procedures.

- The first of these two reports is the seminal case by Shealy et al. (in 1967).⁶
- Some 42-years later, the second case involved the use of SCS to treat lower limb neuropathic pain due to metastases to the spine.⁷

SCS and oncology patients

As oncological care is integral to our patient's health, general considerations for the oncology patient population are listed.

- Radiation therapy.
- Possible malfunction of electronic medical devices during CT scans.⁸ Thus, special consideration is given to:
 - Coregistration technology: PET/CT scans.⁹
 - Screening trends for lung cancer: CT scans.¹⁰
- Shielding of a SCS system is recommended for the above radiological scans or therapy.

Note: MRI safety: to date, only a single SCS system manufacturer has approval by the FDA to permit MRI procedures in patients,¹¹ limited to head/brain exams at 1.5-Tesla.

Conclusions

The use of SCS suppressed intractable pain in the manifestation of PTN.

Literature cited

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