

# **Spinal Cord Stimulator Percutaneous Lead Fracture**

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# Case

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- **81 year old Man with a PMHX of HTN, lumbar spinal stenosis with radiculopathy, and alcohol induced painful neuropathy in bilateral lower extremity who is currently taking gabapentin with persistent pain despite multiple medical and interventional treatments.**
- **The decision was made to trial spinal cord stimulation in an effort to decrease his back, leg, and foot pain from his co-morbid conditions.**

# Pre Trial Workup

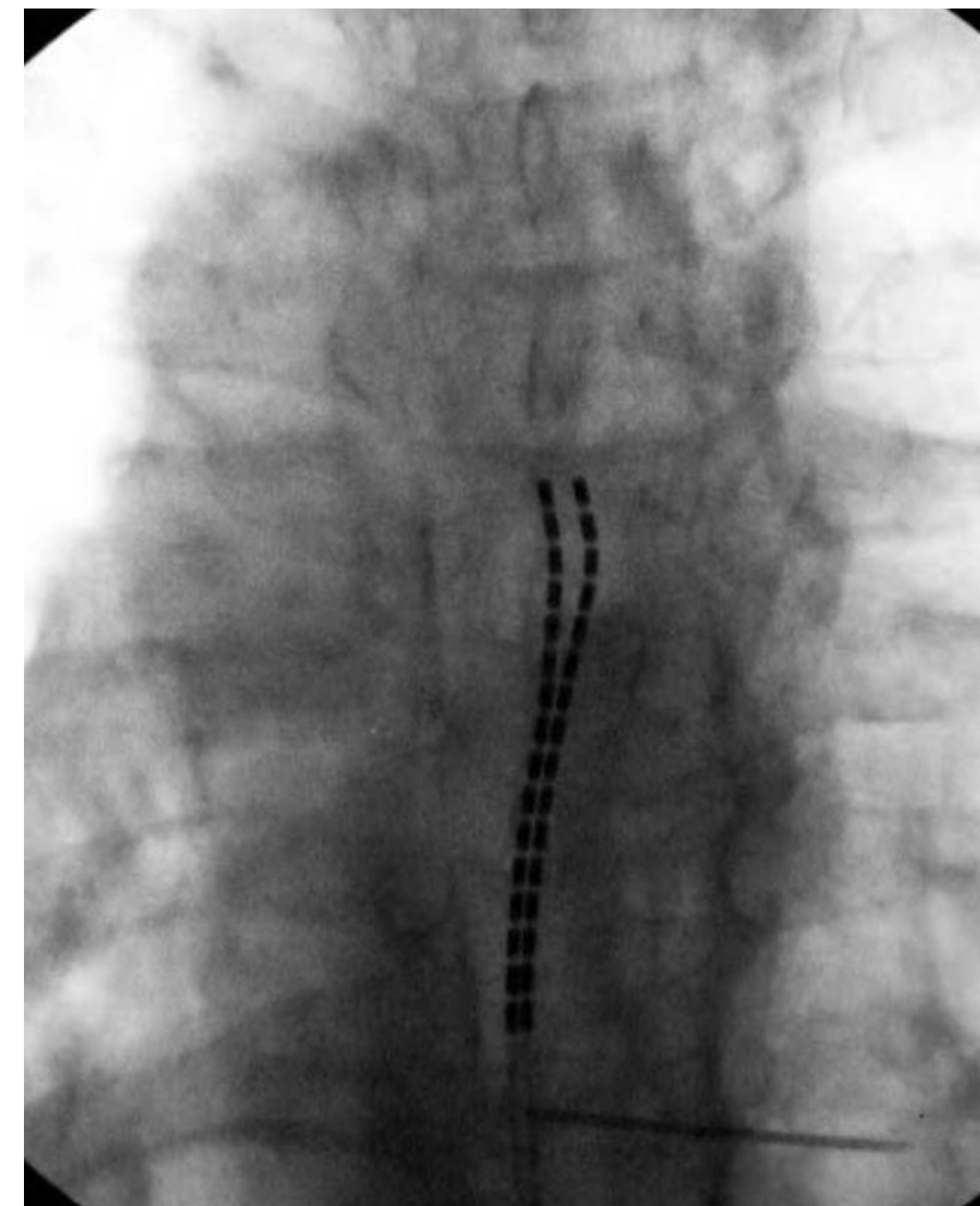
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- **Recent Lumbar Spine imaging demonstrated multilevel degenerative disease, broad-based disc bulges resulting in multilevel foraminal stenosis.**
- **New Thoracic Spine Imaging revealed Thoracic spondylosis without significant central canal stenosis.**
- **Patient obtained Pre-trial Psychiatric evaluation and had pre-trial education session during an office visit with device representative present.**

# Trial Procedure

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- Epidural access obtained via LOR with 2 x 14 gauge epi-med needle at T12-L1
- 2 x SC-2316-50E – 16 contact Trial Infinion leads placed at T6 midline and right of midline – Both performed with 1 pass through, simple silicon trial anchors used to secure.
- Leads secured at skin with silicon sutures and adhesive to skin



# Lead Pull

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- Patient demonstrated significant improvement in back and leg pain with utilization of the SCS device
- Followed up in office to evaluate in 3 days post trial  
Decision was made to pull the trial leads at this visit

Midline trial lead pulled without incident and tips visualized

Right trial lead pulled with mild resistance. Patient asked to provide more lumbar flexion. Continuation of smooth pull motion resulted in “snap” feel. Trial lead visualized with contacts missing



# Lead Pull

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# Lead Pull

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- Patient did not experience additional pain or neurologic deficits
- XR to evaluate position of fracture
- Decision was made to dissect and Retrieve lead during implantation

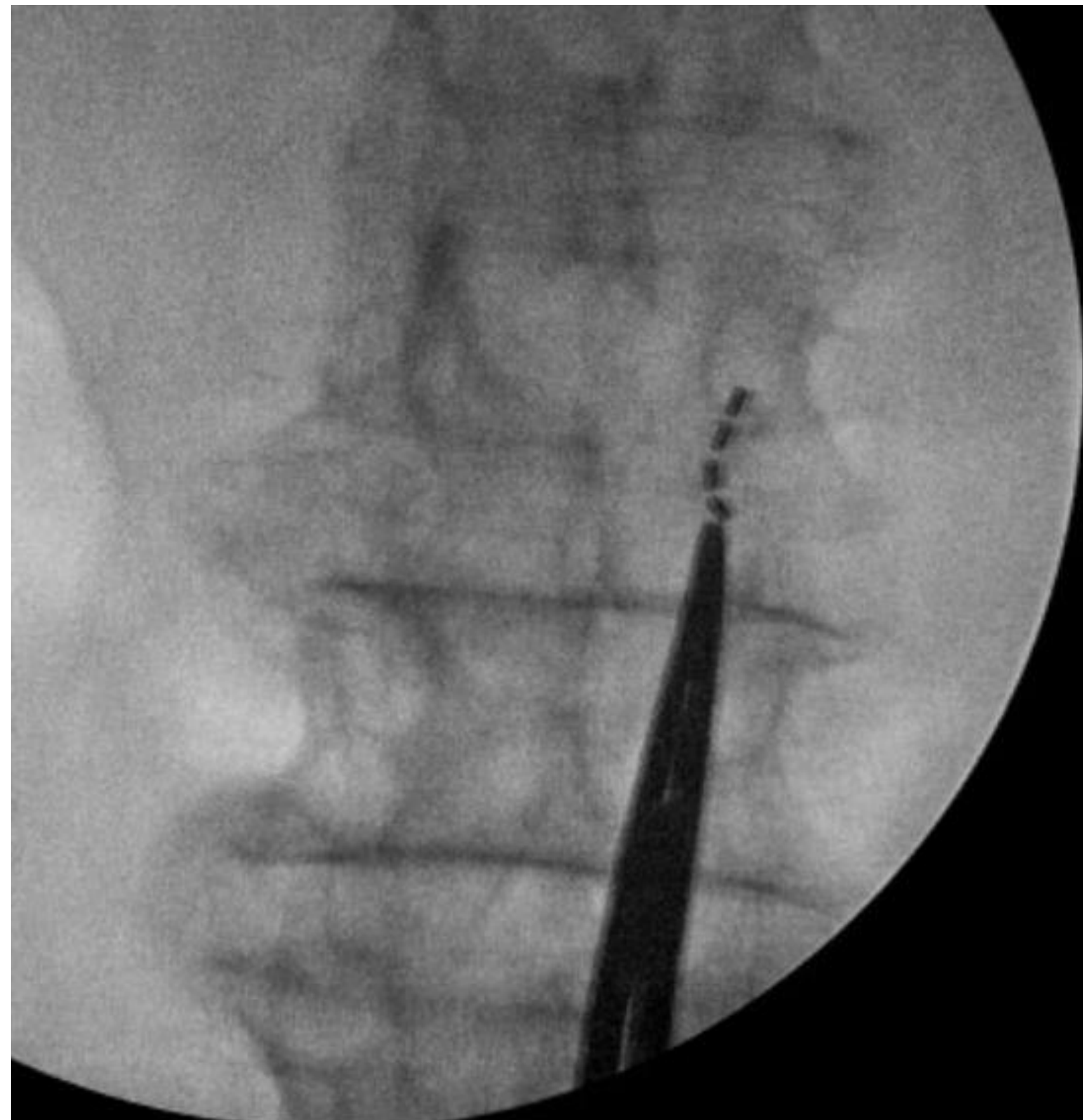




# Implant

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- **Cut-down at lead insertion level over L1-L2**
- **Dissection with Fluoroscopic guidance to retrieve fractured leads through midline incision**





# Retrieval

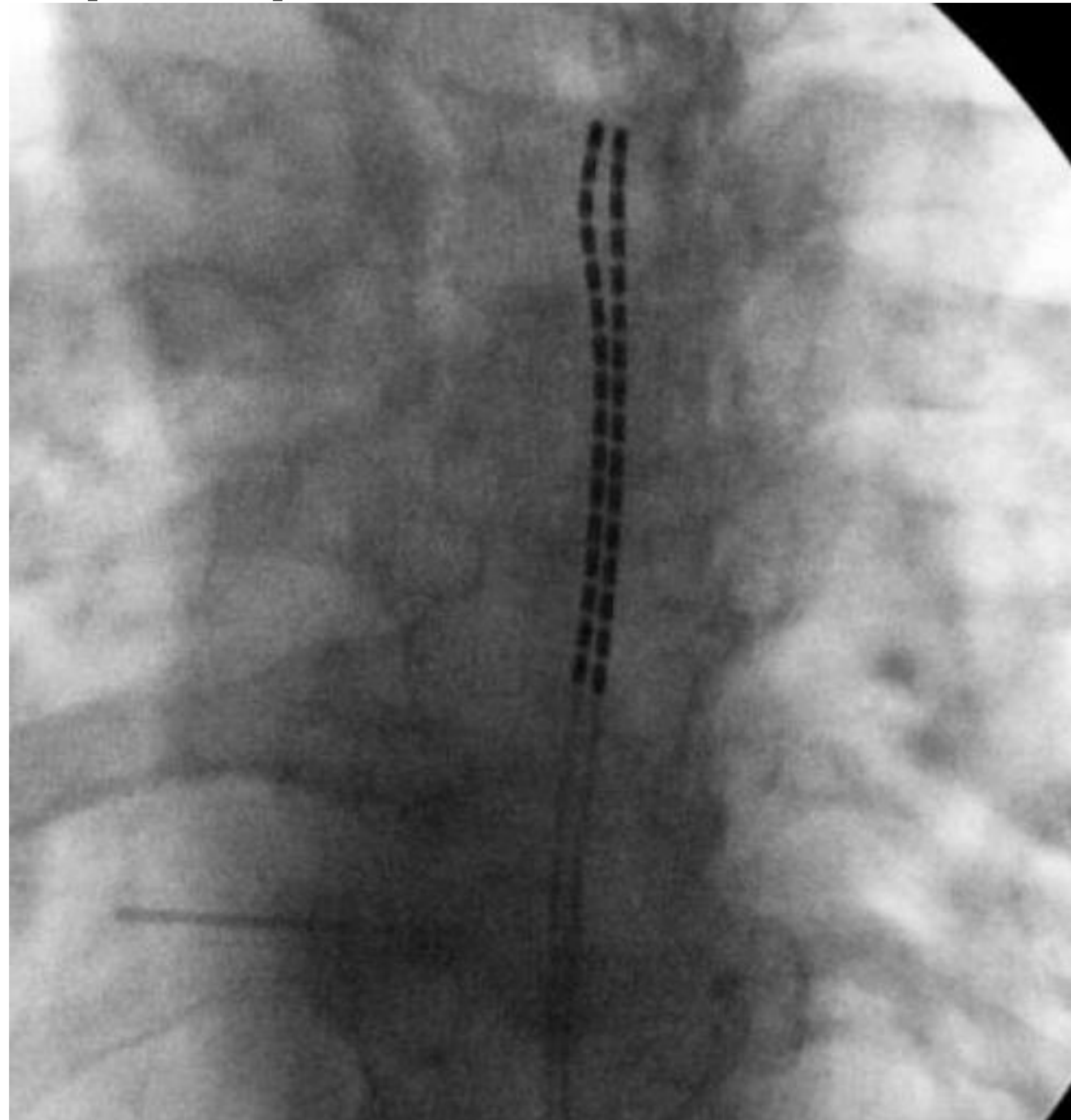
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# Implant

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- **Percutaneous SCS device implanted – good coverage of pain**
- **Uneventful postoperative course**





# Review Article – Complications of Spinal Cord Stimulation and Peripheral Nerve Stimulation Techniques: A Review of the Literature. Pain Medicine 2016; 17: 325–336

- **Fracture Rate Observed from 0 to 10.2%**

**Table 2** Lead fracture and malfunction rates for SCS, ONS, and PNFS

Publication	Therapy type	N	Fracture rate (%)	Publication type
Cameron 2004 [20]	SCS	2,753	9.1	Review Article
Turner 2004 [35]	SCS	830	10.2	Systematic Review
Kumar 2006 [23]	SCS	410	5.9	Retrospective Analysis
Kumar 2008 [24]	SCS	42	7	RCT
Mekhail 2011 [13]	SCS	527	6	Retrospective Analysis
de Vos 2014 [28]	SCS	40	0	RCT
Total	SCS	4,602	Range 0–10.2 Mean 6.37% 95 CI 2.63–10.10	
Schwedt 2007 [18]	ONS	15	0	Retrospective Analysis
Saper 2011 [19]	ONS	51	2	RCT
Sator-Katzenschlager 2010 [31]	PNFS	111	5	Retrospective Analysis
Verrills 2011 [32]	PNFS	100	2	Retrospective Analysis

Confidence intervals are calculated at 95% level.



# Original Article – The Long-Term Durability of Multilumen Concentric Percutaneous Spinal Cord Stimulator Leads.

Pain Practice, Volume 18, Issue 7, 2018 845–849

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- Retrospective, 12.5 year study (2002 to 2014), All patients underwent epidural placement of SCS
- They included 101 patients who received 191 implanted MLC (multi-lumen concentric) 8-contact leads, which they did not have a single lead fracture.
- They felt that the single–lumen leads may be the contributing factor for lead fracture due to non – symmetric space allocation that predispose to internal friction.



# Recommended Management of Lead Fracture

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- **Inform patient**
- **XR to evaluate fracture site**
- **If epidural/ligamentous location or neurologic symptoms including pain – neurosurgery consultation**
- **If subcutaneous location – dissection and retrieval**

# Thank you

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