

Thoracic Paddle-Lead Spinal Cord Stimulation for Refractory Coccydynia: A Case Report



Anannya Pushkarna, OMS-II¹; Nestor D. Tomycz, MD²; Stephen Jaffee, MD²

¹ Duquesne University Nasuti College of Osteopathic Medicine

² Allegheny Health Network, Division of Neurosurgery

Pittsburgh, PA



Introduction

Coccydynia is a chronic pain condition involving the coccyx that may arise from traumatic or atraumatic etiologies, including falls, pregnancy, neoplasm, and idiopathic causes. It is often associated with persistent pain that significantly impairs daily functioning and quality of life. Chronicity has been linked to trauma-induced instability, degenerative changes, and central sensitization, resulting in persistent nociceptive signaling (Lirette et al., 2014).

First-line management includes nonsteroidal anti-inflammatory drugs (NSAIDs), physical therapy, and local injections; however, a subset of patients develops refractory pain despite conservative treatment. Neuromodulation techniques, including spinal cord stimulation (SCS), have demonstrated efficacy in chronic neuropathic pain syndromes, though their role in coccydynia remains poorly defined. Existing literature primarily focuses on sacral nerve root or dorsal root ganglion (DRG) stimulation, with limited reports describing thoracic paddle-lead SCS for coccygeal pain (Haddad et al., 2021).

Case Presentation

Patient

- 48-year-old female
- Chronic post-traumatic coccygeal pain (>20 years)

History of Present Illness

- Onset after fall → Progressive course
- Pain evolved from localized coccygeal pain → Chronic low back + bilateral leg pain
- Reports intermittent sensation of coccygeal instability/dislocation
- Pain significantly limited daily functioning

Failed Conservative Management

- Nonsteroidal anti-inflammatory drugs (NSAIDs)
- Tramadol
- Medical marijuana

Case Presentation

Past Medical & Surgical History

- Hypertension, hyperlipidemia
- Hysterectomy (2008), cesarean sections (1992, 1997), right elbow surgery

Physical Examination

- Normal gait and station
- 5/5 strength in all extremities
- Intact sensation and reflexes
- Focal tenderness over coccyx
- No sacroiliac joint tenderness

Imaging

- Lumbar MRI: L5–S1 spondylolisthesis without significant stenosis
- Thoracic MRI: mild degenerative changes, no cord abnormalities

Clinical Course

- Persistent, treatment-resistant pain → Evaluated for SCS
- Successful trial stimulation with 70–80% pain reduction

Intervention & Outcomes

Procedure

- T9 laminectomy with placement of paddle-lead spinal cord stimulator (SCS)
- Device:
 - Abbott Penta paddle lead
 - Proclaim Elite 5 pulse generator (right buttock)

Intraoperative Guidance

- Continuous neuromonitoring using somatosensory evoked potentials (SSEPs)
- C-arm fluoroscopy used for precise epidural lead placement
- Intraoperative fluoroscopy confirmed appropriate positioning of a five-column paddle lead at the T8 level (Figure 1)

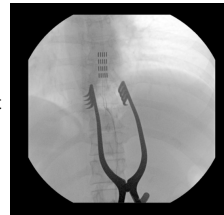


Figure 1

Intervention & Outcomes

Intraoperative Findings

- ~90% suppression of left posterior tibial SSEPs
- ~60% suppression of right posterior tibial SSEPs

Outcomes

- No intraoperative or immediate postoperative complications
- Discharged on postoperative day 1 in stable condition
- No new neurological deficits at follow-up
- Reported sustained pain reduction following implantation

Discussion

Coccydynia is a functionally impairing condition with multifactorial pathophysiology, making it difficult to treat effectively. The coccygeal region has complex and overlapping innervation from sacrococcygeal, gluteal, and perineal nerves, which complicates identification of a single pain generator (Lirette et al., 2014). Chronic pain is often driven by trauma-induced instability, degenerative changes, and central sensitization, leading to persistent nociceptive signaling (Lirette et al., 2014).

Pathophysiologic Challenges

- Complex regional innervation → Difficult pain localization
- Trauma → Instability, inflammation, altered biomechanics
- Central sensitization → Persistent nociceptive signaling

Rationale for SCS

- Modulates dorsal column pain pathways
- Activates inhibitory interneurons
- Reduces transmission of nociceptive signals (Jensen & Brownstone, 2019).

Advantages of Paddle-Lead Systems

- Increased stability compared to percutaneous leads

Discussion Cont.

- Lower rates of lead migration and reoperation
- More durable long-term analgesia (Babu et al., 2013).

Clinical Significance

- Most literature focuses on: Sacral SCS and Dorsal root ganglion (DRG) stimulation
- Limited evidence for thoracic paddle-lead SCS in coccydynia (Haddad et al., 2021)
- This case demonstrates successful use of:
 - Thoracic paddle lead placement
 - Physiologic confirmation via SSEP modulation

Conclusion

Thoracic paddle-lead spinal cord stimulation (SCS) may provide meaningful and sustained pain relief in patients with severe, treatment-resistant coccydynia. This case highlights the successful application of a neuromodulation strategy more commonly used for other neuropathic pain syndromes, demonstrating its potential utility in a less well-studied pain population.

Clinical Applications

- Consider SCS in refractory coccydynia after failed conservative therapy
- Paddle-lead systems offer stable, durable neuromodulation
- Thoracic paddle-lead placement represents an underreported but promising approach

References

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