

Introduction

- **Small fiber neuropathy (SFN)** is a chronic neuropathic disorder affecting small-diameter sensory and autonomic fibers.
- Common causes include **diabetes mellitus**, but symptoms may overlap with **erythromelalgia**, marked by episodic erythema, warmth, and vasomotor instability.
- **Standard therapies** (gabapentinoids, antidepressants, opioids) often yield incomplete relief.
- **Spinal cord stimulation (SCS)** has demonstrated efficacy in painful diabetic neuropathy but remains **underexplored in SFN and erythromelalgia**.
- This case highlights the use of **dual-lead SCS** targeting cervical and thoracic regions to treat widespread sensory and autonomic symptoms.

Case Summary

- **Patient:**
 - 32-year-old male with type 1 diabetes mellitus and 10-year history of progressive neuropathic pain.
- **Symptoms:**
 - Burning pain, hyperalgesia, color and temperature changes, and hyperhidrosis.
 - Initial lower limb involvement → later affected both hands.
 - Symptoms worsened with heat; caused severe functional impairment.
- **Exam & Workup:**
 - Decreased temperature sensation in stocking–glove distribution.
 - Cool, mottled skin, delayed capillary refill.
 - Normal reflexes and strength.
 - EMG: no large-fiber neuropathy.
 - Negative autoimmune, infectious, and genetic workup.
- Diagnosed: **SFN with erythromelalgia-like features**.
- **Prior Treatments (failed/partial response):**
 - Gabapentin → Duloxetine → Tramadol → topical therapies → only partial pain control.

Intervention Summary

Parameter	Description
Device	Medtronic Intellis™ Pro Spinal Cord Stimulator
Lead Placement	Dual-lead: Right Cervical (C4–5) and Left Thoracic (T8–9)
Trial Duration	7 days
Trial Outcome	75–80% pain reduction, improved sleep and ambulation
Additional Effects	Resolved swelling and discoloration; improved thermoregulation
Permanent Implantation	Successful, complication free



Figure 1. Cervical (C4-5) Lead Placement
Fluoroscopic Image



Figure 2. Thoracic (T8-9) Lead Placement
Fluoroscopic Image

Discussion

- **Overlap:** SFN and erythromelalgia both affect small sensory and autonomic fibers → vasomotor instability, burning pain.
- **Mechanism:** SCS may modulate dorsal column and sympathetic pathways, restoring sensory-autonomic balance.
- **Evidence Base:**
 - RCTs show SCS benefits in **painful diabetic neuropathy** (Petersen et al., *JAMA Neurol*, 2021; Duarte et al., *Pain*, 2021).
 - **Emerging reports** demonstrate SCS efficacy in idiopathic and autoimmune SFN (Canós-Verdecho et al., *J Clin Med*, 2025).
- **Innovation:** Dual-lead (cervical + thoracic) coverage provides **widespread dermatomal modulation**—crucial for patients with upper and lower extremity involvement.
- **Clinical Implication:** SCS may offer **multiregional symptom control** in refractory SFN with erythromelalgia-like features, improving both **neuropathic pain and autonomic function**.

Conclusion

- Dual-lead SCS yielded **robust, durable improvement** in pain, temperature regulation, and quality of life
- Suggests **neuromodulation as a viable, underutilized option** for refractory SFN and erythromelalgia.
- Larger studies are warranted to clarify **patient selection, lead targeting, and autonomic outcome metrics**.

Disclosure

- No financial relationship with device manufacturers. Device used as part of standard clinical care.

References

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3. Petersen EA, et al. *JAMA Neurol*. 2021;78(6):687–698.
4. Duarte RV, et al. *Pain*. 2021;162(11):2635–2643.
5. Canós-Verdecho Á, et al. *J Clin Med*. 2025;14(2):652.