Cervical Spinal Cord Stimulation for Refractory Chronic Regional Pain Syndrome

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Introduction

Complex Regional Pain Syndrome (CRPS)

- Rare, disabling chronic pain disorder
- Secondary to
  - Limb injury
  - Fracture
  - Surgery
  - Nerve damage
- First-line management [1]
  - Rehabilitation
  - Psychological therapy
  - Medication.
- **Optimal SCS lead placement and programming for upper-extremity CRPS remain an active area of research**

Spinal Cord Stimulation (SCS)

- Implanted pulse generator delivers electrical current through epidural leads
- Modulates pain signaling at the dorsal horn [2]
- Indications
  - CRPS
  - Neuropathic pain of the trunk or limbs refractory to conservative and pharmacologic therapy [2,4]

ASRA PAIN MEDICINE

UCI School of Medicine

Case Presentation

Patient: 41-year-old woman | **History:** mood disorder, obesity

March 2024 — Injury

- Right wrist slammed into a dumpster door
- Emergency Department: no fracture, no sensorimotor deficit
- Persistent pinky and hand-dorsum numbness with side-to-side sensory asymmetry
- MRI: mild contusion and soft-tissue edema, no nerve damage

2024–2025 — Pain persists >1 year

- Gabapentin **stopped, cognitive fogging**
- Pregabalin
- Duloxetine **dose-limited by tolerability**
- Six stellate ganglion blocks **last gave ~30% relief**
- PT/OT and psychology

Early 2026 — CRPS Type I diagnosed

- Budapest Criteria met: sensory (hyperalgesia), vasomotor (temperature/color asymmetry), sudomotor (sweating changes), motor/trophic (decreased ROM)
- Desipramine **stopped for irritability, anger, nocturnal breathing disturbance**
- Cervical/Thoracic-spine MRI: no stenosis, cord compression, or surgical target

April 2026 — Percutaneous SCS trial

- Single 16-contact lead advanced to C3–C4 (Figure 1)

50–60%

- pain relief
- Improved function
- Effective flare control

July 2026 — Permanent implant

- Boston Scientific cervical SCS
  - Model: SC-221870
  - 70 cm Linear™ ST Lead
- Dual leads: C6 left, C7 right (Figure 2)
- Subcutaneous generator
- Leads enter the spinal canal at the level of T3-T4 and terminate at the level of C4-C5

September 2026 — Follow-up

- Imaging: lead position stable
- Position-dependent variability in coverage, managed with outpatient reprogramming

4 drugs, 6 blocks
plus physical therapy/occupational therapy and psychology **failed to control pain** before SCS

C3–C4 → C6/C7
trial lead to permanent dual-lead configuration

No surgical target
MRI excluded a structural cause; **neuromodulation is the next option**

50% pain relief at follow-up in September

Budapest Criteria [5]

Categories	Signs and Symptoms Required
Sensory	Hyperalgesia and/or allodynia
Vasomotor	Temperature asymmetry and/or skin-color changes
Sudomotor/Edema	Edema and/or sweating changes or asymmetry
Motor/Trophic	Decreased range of motion; motor dysfunction (weakness, tremor, dystonia); trophic changes (hair, nail, skin)



Figure 1: Trial SCS Implant



Figure 2: Permanent SCS Implant



Figure 3: Post-operative cervical spine XR

Results

- Improved sleep quality
- Greater functional use of the right hand at work, with scheduled breaks
- Postoperative imaging confirmed stable lead position (Figure 3)

Discussion & Conclusion

- **Case Highlight: Atypical trigger for CRPS Type 1** [3]
- Underscores the need for individualized pharmacologic titration alongside neuromodulation
- **Emphasizes growing evidence base for cervical SCS in distal upper-extremity CRPS following minor trauma** [4]

References