

Complex Regional Pain Syndrome in a 73-Year-Old Female Post-Needlestick Injury: Interventional Pain Management Strategy

Mohamed Awad, MD, Adam Betcher, MD, Ria Malhotra, MD, Sayed Wahezi, MD

Montefiore Medical Center/Albert Einstein College of Medicine, Bronx, NY, Physical Medicine and Rehabilitation¹



INTRODUCTION

Complex Regional Pain Syndrome (formerly reflex sympathetic dystrophy/causalgia) follows trauma to a limb.

Budapest Criteria for CRPS Diagnosis:

Budapest 1 Criteria (Strict Diagnostic Criteria):

Primarily for research (more stringent).

Requires signs and symptoms in all 4 categories:

- Sensory: Hyperesthesia and/or allodynia.
- Vasomotor: Temperature asymmetry or skin color changes.
- Sudomotor/Edema: Edema or sweating changes/asymmetry.
- Motor/Trophic: Reduced range of motion, motor dysfunction, or trophic changes (skin, hair, nails).

Diagnosis:

- Symptoms in ≥ 3 categories.
- ≥ 1 sign in ≥ 2 categories during physical exam.

Budapest 2 Criteria (Less Strict Clinical Criteria):

- Used in clinical practice (more flexible).
- Same 4 categories as Budapest 1.
- Allows diagnosis with fewer signs/symptoms.
- Less stringent physical exam requirements.

Needlestick-induced neuropathic pain is rare but disabling.

MATERIALS AND METHODS

Informed consent obtained from the patient. Report contains no identifiable information.

IRB exemption granted per Montefiore Medical Center policy.

CASE STUDY

Patient Profile: 73-year-old female with severe left-hand pain.

Cause: Pain followed a needlestick injury at the antecubital fossa.

Onset: Pain began the day after the injury; attributed to nerve damage.

Symptoms:

- Swelling
- Significant functional limitations (unresponsive to occupational therapy)

Examination Findings:

Met Budapest criteria for CRPS, exhibited:

- Allodynia
- Atrophy of intrinsic hand muscles
- Vascular changes
- Mild edema

Diagnostic Imaging: X-ray revealed osteoarthritis in the fingers.

Diagnosis: CRPS Type 3 secondary to needlestick nerve injury (left upper extremity).

Treatment Options Discussed:

- Spinal cord stimulation (SCS)
- Peripheral nerve stimulation (PNS)

Future Plan: Patient opted for PNS targeting:

- Left radial and musculocutaneous nerves
- Ulnar nerve as an alternative

Follow-up Plan: Resumption of occupational therapy post pain control improvement.

DISCUSSION

Risk of Injury: Venipuncture at the antecubital fossa may cause nerve injury due to close proximity of nerves to veins.

Rarity of CRPS Development:

Such injuries rarely result in CRPS, as demonstrated in this case.

Management Challenge:

Treating symptoms post-CRPS diagnosis is complex.

Peripheral Nerve Stimulation (PNS):

- Promising in managing CRPS-related pain.
- Hassenbusch et al. study: 30 of 32 patients achieved $\geq 50\%$ pain reduction with permanent electrode implants.
- 63% reported good or fair relief after 2-4 years.
- VAS pain scores improved from 8.3 ± 0.3 to 3.5 ± 0.4 .
- 20% returned to work.

Additional Findings:

Cooney's research showed PNS improved pain, sleep, and psychological well-being in CRPS patients.

Case Implications: Highlights potential for needlestick injuries to cause chronic CRPS and the effectiveness of PNS for severe pain and functional limitations.

Need for Ongoing Evaluation: Continuous assessment and therapy adjustments are essential for optimal outcomes.

Evidence Quality: Most studies on PNS for CRPS are case series or reports (Level IV evidence), indicating a need for higher-quality research.

REFERENCES

1. Bruehl, S., & Warner, D. S. (2010). Anesthesiology, 113, 713–725. <https://doi.org/10.1097/ALN.0b013e3181e3db38>
2. Hassenbusch, S. J., et al. (1996). J Neurosurg, 84(3), 415–423. <https://doi.org/10.3171/jns.1996.84.3.0415>
3. Hirata, H. (2014). Hand Surgery, 19(2), 151–162. <https://doi.org/10.1142/S0218810414400012>
4. Ramos, J. A. (2014). Braz J Anesthesiol, 64(2), 131–133. <https://doi.org/10.1016/j.bjane.2013.06.003>
5. Xu, J., et al. (2021). Pain Physician, 24(2), E131-E152.