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CASE REPORT PAIN MANAGEMENT

Multimodal interventional pain management for refractory postherpetic neuralgia: a clinical case report

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ABSTRACT

Background: Postherpetic neuralgia (PHN) is a challenging neuropathic pain condition that can persist despite pharmacologic therapy, resulting in significant disability. Interventional pain techniques such as pulsed radiofrequency (PRF) and sympathetic blocks have demonstrated efficacy in refractory cases.

Case Report: A woman in her 50s presented with persistent neuropathic pain in the ulnar nerve distribution of her left-hand following herpes zoster infection. Despite antiviral and multimodal pharmacologic therapy, her pain remained severe and disabling. She underwent a multimodal interventional approach including prolotherapy, ultrasound-guided pulsed radiofrequency ablation of the ulnar nerve, stellate ganglion block, and structured rehabilitation therapy. Following these procedures, the patient's pain intensity decreased from 7–8 to 2–4 on the visual analogue scale, with significant improvement in grip strength and daily function.

Conclusion: This case highlights the role of multimodal image-guided interventions in the management of refractory PHN. Early adoption of interventional techniques combined with rehabilitation may achieve durable pain relief and functional recovery when pharmacologic therapy fails.

Keywords: Postherpetic neuralgia, pulsed radiofrequency, stellate ganglion block, prolotherapy, neuropathic pain, multimodal therapy

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1. INTRODUCTION

Postherpetic neuralgia (PHN) is one of the most common and distressing chronic complications of herpes zoster, resulting from persistent neuronal injury and sensitization following reactivation of the varicella-zoster virus.[1] The condition is characterized by burning, stabbing, or electric shock-like pain that can persist long after the resolution of the acute rash, often leading to insomnia, anxiety, and severe impairment of daily functioning.[2]

First-line pharmacologic therapies such as gabapentinoids, tricyclic antidepressants, and topical anesthetics provide relief for many patients, yet a substantial subset continues to experience significant pain despite adequate dosage and duration.[3] In these refractory cases, interventional pain management options—including pulsed radiofrequency (PRF), sympathetic blocks, and perineural injections—have demonstrated efficacy in reducing neuropathic pain intensity and improving quality of life.[3,4]

However, such image-guided interventions remain underutilized in low- and middle-income countries, partly due to limited access, procedural expertise, and awareness among clinicians.[5] This case report presents a patient with refractory PHN of the ulnar nerve distribution successfully managed using a multimodal

interventional pain management strategy combining PRF, stellate ganglion block (SGB), and prolotherapy.

2. CASE REPORT

A 54-year-old woman presented with persistent burning, electric shock-like pain in her left hand, particularly affecting the fourth and fifth digits. The pain began following a vesicular rash in the C8–T1 dermatome in January 2025. Despite receiving acyclovir and multimodal analgesics (gabapentin, tramadol, ibuprofen, and amitriptyline), her pain persisted with a visual analogue score (VAS) of 7–8, significantly impairing her sleep and daily functioning as a street vendor.

Physical examination revealed pronounced allodynia, hyperalgesia, and reduced grip strength localized to the ulnar nerve distribution. The fourth and fifth digits exhibited sensory deficits and mild motor impairment. The absence of neck pain, trauma, or autonomic dysfunction ruled out cervical radiculopathy, cubital tunnel syndrome, and complex regional pain syndrome. The preceding vesicular rash confirmed postherpetic neuralgia affecting the ulnar nerve.

A stepwise interventional approach was planned. The patient received prolotherapy targeting the left ulnar nerve on March 17 and April 8, 2025, using 5% dextrose with bupivacaine. Ultrasound-guided pulsed radiofrequency (PRF) of the ulnar nerve was performed on April 21, 2025, using two 10-minute cycles at 40°C, followed by 0.125% bupivacaine and dexamethasone injection. A left stellate ganglion block (SGB) was subsequently performed under ultrasound guidance at the C6–C7 level. Adjunctive rehabilitation included transcutaneous electrical nerve stimulation, low-level laser therapy, and guided wrist and hand exercises.

Following PRF and SGB, the patient reported substantial pain reduction (VAS 7–8 to 2–4) and progressive improvement in grip strength. She continued oral analgesics (gabapentin, tramadol, ibuprofen) and participated in regular rehabilitation sessions. Over subsequent weeks, hand strength and dexterity improved, allowing her to resume light work-related activities with minimal discomfort.

3. DISCUSSION

Postherpetic neuralgia represents a complex neuropathic pain syndrome arising from reactivation of the varicella-zoster virus, which causes chronic damage to sensory neurons and aberrant nociceptive signaling.[1,2] Persistent neuronal hyperexcitability and central sensitization lead to ongoing pain and hypersensitivity, even in the absence of active infection.

Pharmacologic therapy remains first-line but is often insufficient in refractory cases. PRF has emerged as a valuable interventional technique because it modulates nociceptive transmission without causing thermal damage. The intermittent bursts of high-frequency current reduce ectopic discharges and neuroinflammation.[3] While PRF was traditionally directed to the dorsal root ganglion, increasing evidence supports peripheral nerve application in focal pain syndromes.[4,5]

Stellate ganglion block (SGB) provides a complementary effect by interrupting sympathetic efferents at the cervical level, improving regional circulation, and attenuating sympathetically maintained pain.[6] Early use of SGB during acute herpes zoster may also decrease the risk of PHN development.[7]

Prolotherapy using low-concentration dextrose has shown potential in modulating nociceptive activity and inflammatory cytokine expression rather than purely promoting tissue regeneration. Studies demonstrate decreases in IL-6 and CRP and increases in IL-10 following dextrose injection, contributing to analgesia.[8,9] Indonesian case series have similarly reported improved pain scores and function in PHN patients treated with dextrose prolotherapy.[10,11]

Moreover, combined approaches have shown synergistic benefit. A controlled study by Wang et al. demonstrated enhanced pain reduction when extracorporeal shock wave therapy was combined with SGB compared to either modality alone.[12] In refractory cases, peripheral nerve stimulation (PNS) provides another non-destructive option for long-term pain control.[5,13]

The multimodal integration of PRF, SGB, and prolotherapy—as used in this case—aligns with contemporary neuropathic pain management guidelines emphasizing individualized, multimodal strategies tailored to symptom distribution and patient response.[14] This coordinated, evidence-based approach yielded meaningful pain relief and functional restoration in our patient.

4. CONCLUSION

A multimodal interventional pain management strategy combining pulsed radiofrequency, stellate ganglion block, and prolotherapy achieved significant and durable pain relief in a patient with refractory postherpetic neuralgia. Early use of image-guided interventions alongside pharmacologic therapy and rehabilitation can prevent chronic pain disability and enhance functional recovery.

5. Conflict of interest

None declared by the authors

6. Ethical considerations

This report followed the provisions of the Declation of Helsini.

7. Authors contribution

IMH: primary author, clinical management, and manuscript preparation.

P: consultant, reviewer of interventional strategy, and manuscript supervision.

R: consultant, reviewer of interventional plan, and procedure advisor.

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