The Hidden Role of Peripheral Nerve Neuroma

Salma Haider, MPH DPM: Cleveland Clinic Foundation

Purpose:

Chronic foot and ankle wounds often present with multifactorial pain, commonly attributed to infection, ischemia or mechanical irritation. While peripheral arterial disease (PAD) is a frequent contributor, persistent pain can occur even after successful revascularization, warranting further evaluation for alternative causes. One such under-recognized source is neuropathic pain arising from peripheral nerve pathology, including neuroma formation.

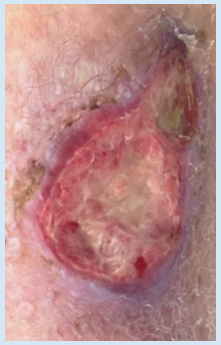
This case report highlights the diagnostic challenge and successful management of wound-associated neuropathic pain due to a superficial peroneal nerve neuroma, emphasizing the value of nerve-targeted surgical intervention when conventional causes have been addressed.

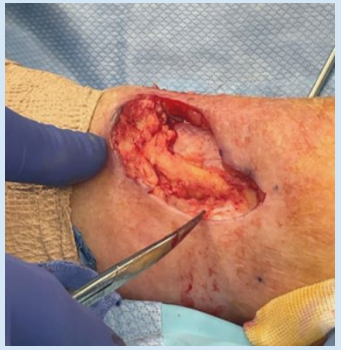
Case Study

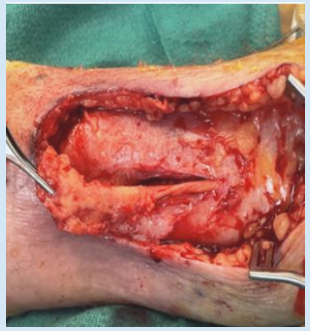
- An 85-year-old non-diabetic female with a complex medical history of CKD stage 3, HTN, COPD, rheumatoid arthritis, Raynaud's phenomenon, peripheral neuropathy, and PAD s/p balloon angioplasty of the left lower extremity presented with a chronic, painful ulcer on the distal lateral leg.
- The ulcer initially improved with aggressive wound care regimen and revascularization. However, despite early progress the wound relapsed, becoming larger and increasingly painful.
- A duplex ultrasound Doppler revealed recurrent peripheral arterial disease, prompting a *repeat* balloon angioplasty. Although mild improvement was noted following the intervention, the patient later developed severe, sharp, movement-induced pain (10/10) and progressive wound enlargement, despite adequate perfusion.
- Biopsy revealed: chronic scar and granulation tissue without infection or malignancy
- Given the anatomical location and intraoperative observations, it was determined that the patient's significant pain was most likely attributable to a neuroma of the superficial peroneal nerve located at the wound base.

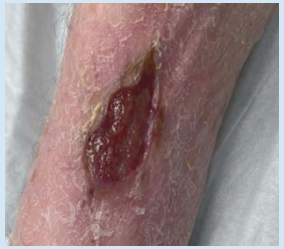
Surgical Description

- Excision of a superficial peroneal nerve neuroma identified at the wound base. The nerve appeared bulbous and hypertrophic at its distal branches.
- The neuroma was excised, and the proximal segment was resected to normal nerve caliber, repaired with epineurial 6-0 Prolene, and implanted into adjacent lateral leg musculature to prevent recurrence.









Discussion

Neuropathic pain mechanisms are frequently under-recognized, particularly when pain persists despite successful revascularization and adequate wound care.

When conservative measures fail such as utilizing first line pharmacologic treatments such as SNRI or gabapentin, surgical management provides definitive treatment. Established strategies include neuroma excision with transposition of the proximal nerve stump into muscle or bone, targeted muscle reinnervation, or nerve allograft reconstruction. These techniques have been shown to yield durable pain relief, improved ambulation, and enhanced quality of life in patients with lower-extremity neuromas.

Ultimately, this case emphasizes that chronic wound pain should not be attributed solely to vascular insufficiency or infection once these have been addressed. Peripheral nerve pathology must remain within the differential diagnosis. Nerve-targeted surgery, when performed in appropriately selected patients, can serve as a vital adjunct to limb salvage efforts, optimizing both pain control and functional recovery.

References

Ducic I, Mafi AA, Attinger CE, Couch K, Al-Attar A. Plastic and Reconstructive Surgery. 2008;122(1):193-197. doi:10.1097/PRS.0b013e318177422c.

Poppler LH, Parikh RP, Bichanich MJ, et al.Pain. 2018;159(2):214-223. doi:10.1097/j.