

# **PORTUGUESE MAN O' WAR-INDUCED SURAL COMPRESSION NEUROPATHY: A CASE REPORT**

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**Background:** The Portuguese man o' war (*Physalia physalis*) is an organism that lives in semitropical areas of the Atlantic Ocean, including off the coast of the United States. It has long tentacles extending far beyond the organism that pose a risk to swimmers. The most common symptoms of envenomation include local reactions at the site of injury, but systemic effects are possible with significant venom burden. Long-term effects are uncommon, but persistent cutaneous changes have been described.

**Case Report:** A 46-year-old woman presented with persistent shooting, burning left lower extremity pain following contact with a Portuguese man o' war one year prior.

**Conclusion:** Here we report a case of persistent sural compression neuropathy following envenomation by a Portuguese man o' war responsive to conservative management including medications for neuropathic pain, physical therapy, and sural nerve blocks.

**Key words:** Sural nerve compression, jellyfish sting, Portuguese man o' war, envenomation, compression neuropathy, case report

## **BACKGROUND**

The Portuguese man o' war (*Physalia physalis*) is a blue-colored siphonophore that lives at the air-water interface in semitropical areas of the Atlantic ocean, including off the coast of the Carolinas, Florida, the Gulf of Mexico, and the Caribbean (1). It is composed of many individual polyps working together for feeding, defensive, and reproductive functions (2,3). It is characterized by the presence of a gas-filled bladder that resembles a sailing warship and enables it to travel across the ocean (4,5). The organism also contains a tail on the surface of the water with tentacles that may extend 150 feet or more below the surface that are lined with nematocysts which inject venom into the victim when disturbed (1,6).

The most common symptoms reported from envenomation include local burning and paresthesias as well as long and linear erythematous and edematous plaques, blisters, and skin necrosis. Systemic symptoms

have also been reported from cases of severe envenomation including nausea, vomiting, hypotension, seizures, cardiac arrhythmias, respiratory failure, and death (1,2,4). Long-term sequelae are uncommon, however persistent toxic contact dermatitis refractory to steroid treatment has been reported (5). Here we report a case of chronic sural compression neuropathy resulting from Portuguese man o' war envenomation.

## **CASE PRESENTATION**

A 46-year-old woman with a medical history of fibromyalgia presented with left lower extremity pain and swelling following contact to her bilateral lower extremities with a Portuguese man o' war one year prior. Notably, she also had a history of left hip pain related to a labral tear. She had arthroscopic debridement, ultimately followed by a left total hip replacement, 6 years prior to the Portuguese man o' war injuries. After

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surgery, she reported numbness radiating down the lateral left leg which improved over time to constant numbness over the left lateral thigh.

At the time of her initial injuries, she was on a trip to the beach in South Carolina during which she was stung on her bilateral lower extremities by a Portuguese man o' war. She developed severe skin changes (Fig. 1) and bilateral lower extremity swelling and pain. Over time, her skin changes resolved (Fig. 2). However, she continued to have left-sided lateral lower extremity pain that was worst at the ankle. She also had occasional radiation up to the lateral calf, in addition to left lower extremity swelling and skin discoloration. She described her pain as throbbing, stabbing, burning, aching, tender, splitting, exhausting, sickening, and fearful. Her pain was rated at 4/10 on average and was exacerbated by walking, temperature changes, standing, light touch, and strain. She used ice, elevation, compression stockings, rest, and medications with some relief. She also used acupuncture and cupping with some benefit.

Prior to visiting our pain management clinic, she was started on a course of gabapentin 300 mg 3 times a day; she reported mild improvement that was dose-limited due to forgetfulness. Amitriptyline caused worsening lower extremity swelling and was discontinued. Prednisone, capsaicin cream, and lidocaine patches were trialed without significant benefit. She saw a dermatologist who had no explanation for her persistent symptoms. When she presented to our clinic, her pain was noted to be in the distribution of the left sural nerve. On exam she had allodynia in the distribution of the sural nerve as well as a positive Tinel sign over the left sural nerve in the ankle, proximal to a scar from a prior jellyfish sting.

She was diagnosed with left sural neuropathy, started on 100 mg 3 times a day of pregabalin, referred to physi-

cal therapy, and underwent a left ultrasound-guided sural nerve block with bupivacaine and dexamethasone. Following the block, she had immediate improvement in her pain and reported significant benefit in pain for one month following the injection before her pain began to return. She continues dedicated physical therapy to mobilize the left sural nerve and correct ankle pronation due to insufficient dorsiflexion, likely leading to the continued sural nerve irritation. She was offered a referral for consideration of surgical decompression of the sural nerve but declined in favor of continued beneficial conservative management with medications, physical therapy, and as needed, sural nerve blocks (7).

## DISCUSSION

The sural nerve is a cutaneous nerve formed by the terminal branches of the common peroneal nerve and tibial nerve from the S1 and S2 nerve roots (8,9). It forms in the posterior leg in the popliteal fossa and travels laterally between the 2 heads of the gastrocnemius, passes posteriorly between the calcaneus and the lateral malleolus, and reaches the lateral tuberosity of the fifth toe to innervate the posterolateral distal leg and the lateral foot, heel, and ankle.

Isolated sural neuropathy is an uncommon condition characterized by pain, numbness, paresthesias, and hypersensitivity in the distribution of the sural nerve. A diagnosis is clinical, although electrodiagnostic testing can be considered to differentiate between similar conditions, including lumbar radiculopathy. Patients may have a positive Tinel sign over the sural nerve in the calf; diagnostic imaging to evaluate for a sural nerve lesion or sural nerve biopsy can be considered when there is an unclear history and physical exam findings (8-10).

Our patient demonstrated pain in the distribution of the sural nerve at the ankle, likely caused by develop-



Fig. 1. Lower extremity wounds following Portuguese man-o-war envenomation at different stages of healing

ment of scar tissue from the Portuguese man o' war envenomation. Confirmation of her diagnosis was her relief of pain following the diagnostic sural nerve block.

Conservative management includes anti-inflammatory medications; muscle relaxants; medications for neuropathic pain including gabapentinoids, tricyclic antidepressants, and serotonin and norepinephrine reuptake inhibitors; physical therapy; and sural nerve blocks for diagnostic and therapeutic effects. In addition, pain relief has been reported following pulsed radiofrequency ablation of the sural nerve (11). Surgical decompression of the sural nerve can be considered when conservative treatment fails.

Sural neuropathy is most frequently the result of trauma and typically occurs following injuries including ankle fracture, ankle trauma, and external compression (10,12,13). It has been reported as a complication of ankle surgery as well as following sural nerve harvest for nerve graft (10,14). Isolated sural neuropathy has been reported with vasculitis, and sural neuropathy is associated with diabetic peripheral neuropathy (10,15,16). To the best of our knowledge, this is the first report of sural compression neuropathy following Portuguese man o' war envenomation.

Interestingly, although the patient had Portuguese man o' war injuries to her bilateral lower extremities, she developed chronic sural neuropathy only on the left side. This could in part be related to more significant envenomation on the left lower extremity over the sural nerve as she had more significant pain and cutaneous changes on the left (Fig. 1). She could also have been predisposed to left sural nerve injury given her history of left hip pain and left hip arthroplasty. Nerve injury has previously been reported as a complication of total hip arthroplasty, most commonly to the lateral femoral cutaneous nerve, femoral nerve, superior gluteal nerve, and sciatic/peroneal nerve (17). Ipsilateral electrophysiological and histological changes in the sural nerve have previously been reported following hip surgery in patients with ipsilateral leg weakness and pain one month postoperatively (18,19). Following her hip surgery, she reported persistent numbness radiating down her lateral left lower extremity, potentially suggesting the presence of a postoperative nerve injury that could have been further exacerbated by the Portuguese man



Fig. 2. Healed bilateral lower extremity skin wounds one year following Portuguese man-o-war envenomation with persistent left lower extremity pain

o' war envenomation.

## CONCLUSION

Here we report a case of left sural neuropathy following a Portuguese man o' war injury. Long-term sequelae of envenomation are rare and to our knowledge, this is the first report of sural neuropathy following a Portuguese man o' war injury. This case highlights an unusual cause of compression sural neuropathy following a Portuguese man o' war envenomation. This case also highlights the utility of ultrasound guided sural nerve blocks as a potential treatment for compression sural neuropathy.

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