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Ultrasound-Guided Hydrodissection for Chronic Tarsal Tunnel Syndrome With Vasomotor Symptoms

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INTRODUCTION

Tarsal tunnel syndrome (TTS) is a clinical condition characterized by entrapment of the posterior tibial nerve within the tarsal tunnel at the medial ankle. Neuropathic pain and sensory disturbance on the sole are characteristic, and vasomotor symptoms may also be present. However, no cases have reported the utility of hydrodissection in chronic TTS presentations dominated by vasomotor symptoms. In addition, although TTS has been treated with hydrodissection in several cases, with steroid doses varying up to 40 mg, there is still no consensus on the precise indications for this procedure.

CASE

A 36-year-old man presented with a 2.5-year history of refractory left plantar pain (visual analog scale score, 6) and persistent cold sensation. He reported no history of trauma other than a left ankle sprain that occurred approximately six months prior to symptom onset.

Physical examination revealed focal plantar tenderness with paresthesia, and cold sensation was confirmed on thermal assessment. The patient reported difficulty bearing weight on the left lower extremity because of pain. Pain-limited manual muscle testing showed Medical Research Council grade 3 strength of the left ankle plantarflexors with Tinel's sign on the tarsal tunnel was positive. Ultrasonography demonstrated enlargement of the left posterior tibial nerve, with a cross-sectional area of 17 mm² compared with 8 mm² on the contralateral side (Fig. 1). Ankle–brachial index and lumbar spine imaging excluded vascular insufficiency and radiculopathy (Fig. 2). Based on the clinical and imaging findings, TTS was diagnosed.

Ultrasound-guided hydrodissection was performed using a mixture of triamcinolone acetonide (10 mg), 2% lidocaine (4 mL), and normal saline (6 mL). At 2 weeks, pain decreased to a visual analog scale score of 2, muscle strength improved to grade 5, and cold sensation resolved with normalization of plantar temperature. Weight-bearing tolerance and comfort during the terminal stance phase of gait also improved.

Fig. 1 Axial ultrasound on the level of the medial malleolus showing enlargement of the left posterior tibial nerve with a cross-sectional area of 17 mm² (normal: <11 mm²; contralateral side: 8 mm²)

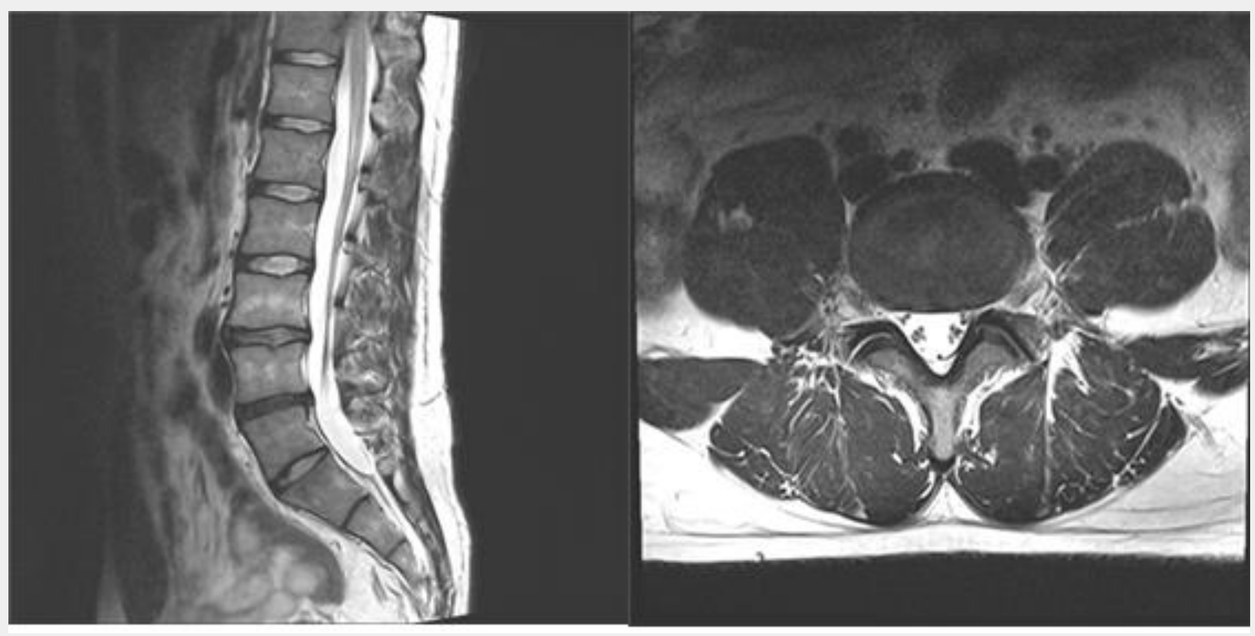

Fig. 2 Lumbar spine magnetic resonance imaging (MRI) demonstrated no definite evidence of nerve root compression or radiculopathy

DISCUSSION

To the best of our knowledge, this is the first reported case of TTS with prominent vasomotor symptoms successfully managed with nerve hydrodissection combined with a low-dose corticosteroid. Additionally, no prior cases have reported benefit from nerve hydrodissection in chronic presentations where vasomotor symptoms are dominant.

Vasomotor manifestations, such as cold sensation and temperature asymmetry, are thought to result from compression-induced dysfunction of sympathetic fibers within the posterior tibial nerve. This mechanism is supported by human studies showing cold sensitivity in entrapment neuropathies and by animal models demonstrating altered sympathetic fibers and microcirculation after nerve compression.

Ultrasound-guided hydrodissection mechanically separates the entrapped nerve from surrounding adhesions, thereby restoring nerve gliding and reducing perineural compression. Although standardized indications and protocols for hydrodissection in TTS have not yet been established, its minimally invasive nature and favorable risk–benefit profile make it a reasonable therapeutic option in selected cases of chronic nerve compression. Further studies are warranted to clarify the indications, mechanisms, and long-term outcomes of this intervention in TTS.

CONCLUSION

Hydrodissection with low-dose corticosteroid may be a viable therapeutic option for chronic TTS accompanied by vasomotor symptoms