Tarsal tunnel syndrome is a relatively rare compressive neuropathy of the posterior tibial nerve in the medial aspect of the ankle. Entrapment of the nerve was first described independently by Keck and Lam in 1962, and the sources of pressure may be from without or within the tarsal tunnel. Varicosities are a significant and frequent, space-occupying lesion, presented more frequently in obese females. The clinical presentation and the involvement of magnetic resonance imaging (MRI) are very important in the diagnosis of varicosities as a compressive pathology into the tarsal tunnel. In the existing literature, it is difficult to find accurate demographic information and specific clinical data regarding patients with varicosities. The aim of this study is to analyze varicosities as an etiology of tarsal tunnel syndrome and the role of Tinel’s sign in diagnosis. We present two case studies of two young men, through a large review of the literature.

Case Reports

Case 1

A 25-year-old man presented to the orthopaedic department of the University Hospital of Heraklion, Crete, Greece, with a burning pain without paresthesia in the medial aspect of the right ankle that had been present for the previous 10 months. The patient was in the military. The pain was worse after walking and improved after bed rest and foot elevation. No night pain was present and no foot and ankle deformities were observed. There was a history of ankle sprain 4 years earlier and the patient was moderately obese, with a body mass density of 31 kg/m². His Maryland foot score (MFS) was 62. The patient underwent various consultations without diagnosis; nonsteroidal anti-inflammatory drugs were periodically prescribed and nonweightbearing was periodically recommended. Tinel’s sign was inconclusive in the afternoon and absent in the morning. No radiculopathy was diagnosed after clinical and MRI examinations of the back. No motor weakness of the abductor hallucis longus muscle was revealed, but a moderate tenderness along the path of the posterior tibial nerve was mentioned. There was no history of diabetes mellitus neuropathy, endocrinopathy, or collagen disease. The posterosuperior oblique radiographic view of the right ankle was negative for talocalcaneal coalition and bone deformities. No electromyogram examination was performed.

The MRI examination of the ankle confirmed the presence of varicose veins within the tarsal tunnel (Fig. 1). The surgical intervention was conducted under general anesthesia without tourniquet application. The surgical exposure was performed according to Lam, with a curved incision postero-inferior to the medial malleolus. A full resection of the flexor retinaculum was carried out. The tarsal canal was...
carefully inspected and a tortuous posterior tibial vein with varicosities was identified very close to the nerve. The nerve was retracted with a Penrose drain. No other space-occupying lesions were observed (Fig. 2). The dissected nerve had a normal appearance without segmentary flattening. The calcaneal branch of the posterior tibialis nerve was preserved. A subcutaneous piece of fat was inserted between the vein and nerve to avoid post-surgical fibrosis.

The nerves were freed up completely, distally into the foot, as compression can occur on the deep surface of the abductor hallucis muscle. A subcutaneous drain was inserted, and after the skin closure a short leg ankle-foot support was fitted and nonweightbearing was recommended for 3 weeks. The patient was encouraged to return to normal activity. Eighteen months after the surgical treatment, the patient was free of symptoms, with an MFS of 90.

Case 2

A 22-year-old man presented to our orthopedic department with a pain in the anteromedial aspect of both ankles. The pain was worse on the left side, with a dull onset and progressive inability to stay in an erect position for long periods of time, which required him to lie down every 3 to 4 hours. The patient, as in the first case, had undergone various medical consultations without a diagnosis for the symptoms. The Tinel sign was absent in both feet in the morning and was inconclusive in the afternoon on the left side only. No tension sign was provoked, and the neurologic examination was negative for spinal disease. His MFS was 58. On MRI examination of the ankles, compression of the tibialis posterior nerve within the tarsal tunnel attributable to varicosities was diagnosed (Figs. 3 and 4). The history, clinical examination, and all laboratory studies for collagen disease and endocrinopathy were negative. No superficial varicosities were seen on the lower legs. The intraoperative findings and the postoperative management were similar to the first case (Fig. 5). Fourteen months after surgical decompression, the patient was free of symptoms with an MFS of 84.

Discussion

The entrapment of the posterior tibial nerve was first described independently by Keck and Lam in 1962. The nerve is easily affected by structural changes within the tarsal tunnel, such as those caused by inflammation or space-occupying lesions, because of the relatively inelastic structure of the fibro-osseous canal. We present the possible etiologies of tarsal tunnel syndrome in Table 1. Classic symptoms include pain, often worse at night or with activity, and numbness in the distribution of the posterior tibial nerve branches. Electromyography is not routinely used because its use is based on the experience of the examiner.
However, a normal nerve conduction study may not exclude an entrapment neuropathy. In approximately 70% of patients with tarsal tunnel syndrome, a specific etiology can be identified; but one study mentions a frequency of 45% of the cases as “idiopathic.”

In recent literature, patient ages ranged from 7 years to 72 years. In a 1996 review, the average duration of symptoms was 31 months and the average age was 48 years.

Patients are predominantly women, with a variable frequency from 61% to 78%. Varicosities are not a rare cause of tarsal tunnel syndrome. Within the tarsal tunnel, the nerve and arteriovenous complex run together, a different condition from that in the carpal and cubital canal. In a study by Baba et al of 31 patients (37 feet), no presence of varicosities were observed intraoperatively. In other studies, the frequency varies from 4% to 33%.

Gould and Alvares presented a case report of bilateral tarsal tunnel syndrome in a 39-year-old slightly overweight woman, with a long history of varicose veins in her legs. In this case a vein stripping was performed in both legs.

Magnetic resonance imaging of the ankle is very useful in the diagnosis of tarsal tunnel syndrome, and one study reports 8 of 33 feet (24%) with varicosities. Tarsal tunnel syndrome is a rare disorder in young men, and the presence of varicosities is infrequent. To our knowledge, the role of Tinel’s sign in the presence of varicosities within the tarsal tunnel has not been analyzed. In general, most references in the literature present a positive Tinel’s sign.

The clinical value of Tinel's sign remains controversial. Tinel described a tingling sensation after studying a large number of peripheral nerve injuries and non-compression of the nerve into an anatomic canal with variable duration. He believed this sensation to be mediated by young axis cylinders in the process of regeneration. The patient frequently cannot distinguish between a tingling sensation (or formication) and pain. A true Tinel sign is never painful. If pain is present, it should be regarded as evidence of a neuroma or as a neuroma-like sign.
Tarsal tunnel syndrome is a rare pathology with a large and different etiology. It is more frequent in females during the fourth and fifth decade of life, but physicians must be attentive when young male patients (without demographic risk) are presented without an apparent cause of compression or a clear positive Tinel's sign. The diagnosis may be difficult, but a detailed history, a good clinical examination, and the help of MRI are very important when varicosities are present.

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References