A Rare Case of Concomitant Flexor Digitorum Accessorius Longus and Accessory Peroneocalcaneus Internus: The Etiology of Chronic Tarsal Tunnel Syndrome.

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Introduction

Tarsal Tunnel Syndrome (TTS) is a commonly encountered ankle pathology that results from compressive entrapment of the tibial nerve. Many conditions have been reported to cause symptomatic TTS including space-occupying lesions, systemic diseases, direct trauma, and malalignment of the hindfoot and ankle. The condition can be difficult to diagnose and often MRI and EMG/NCV can be used adjunctively. The purpose of this case report is to describe a symptomatic TTS whereby the neurovascular complex was noted to still contain the flexor digitorum longus tendon. The patient was treated surgically with satisfactory results.

Case Presentation

A 32 year old male presented to the office with a 10 year history of radiating pain, cramping, and spasm in his left leg and ankle. Patient had seen a neurologist one year prior, who diagnosed tarsal tunnel syndrome with an EMG/NCV. MRI of his lumbar spine and pelvis were negative for acute findings. A diagnostic nerve block was also consistent with tarsal tunnel syndrome. Next, an MRI of the left ankle was obtained to evaluate for a space-occupying lesion. An abnormality in the tarsal tunnel was noted on MRI, but thought to possibly be a post-injection hematoma. As the patient had failed years of conservative management, the decision was made to surgically release the left tarsal tunnel.

Procedure

In the pre-operative holding area, the most superior area of tenderness over the left tarsal tunnel was identified and marked. The patient was taken to the operating room and administered general anesthesia. A 13 cm curvilinear longitudinal incision was placed over the tarsal tunnel starting just superior to the marked area distally along the medial aspect of the foot. The 3rd compartment of the flexor retinaculum was identified and incised to reveal the neurovascular bundle. The tibial nerve was identified along with an overlying muscularispendinous structure. The tendon was noted to wrap around and strangulate the nerve. When the tendon was pulled, the lesser toes were noted to plantar flex. At this time, the 2nd compartment was inspected and noted to still contain the flexor digitorum longus tendon. It was decided that this was an accessory tendon and would be excised at this time. The tendon was cut both superiorly and inferiorly removing a large segment of the tendon.

The abductor hallucis fascia was then freed. No further areas of impingement were noted around the nerve. An annumatic graft was wrapped around the nerve and the incision was closed leaving the flexor retinaculum open. The patient was placed in a posterior splint and woke from anesthesia. He tolerated the procedure and anesthesia well without complication.

Results

Post-operatively, the initial MRI was again reviewed with an MSK MRI trained radiologist. In keeping with the intra-operative findings, an accessory tendon was noted in the 3rd flexor compartment consistent with Flexor Digitorum Accessorius Longus (FDAL). Furthermore, a second accessory structure was identified in the 4th flexor compartment consistent with Peroneocalcaneus Internus (PCI). These findings indicate both medial and lateral compartment of the tibial nerve within the tarsal tunnel. The patient had a normal postoperative course and completed 2 courses of physical therapy. He reported significant improvement of symptoms at the final 10 month post-operative visit.

While there is abundance of data in the literature regarding tarsal tunnel syndrome, there is very little data relating accessory muscles of the leg as the primary etiology. Many cases of TTS can be treated conservatively, especially if related to biomechanics and over pronation causing compression on the tibial nerve. However, if an accessory muscle is identified as the cause of TTS, surgical excision of the accessory muscle and decompression of the nerve must be considered at a much lower threshold for definitive treatment. Therefore, the importance of recognizing an accessory muscle as the cause of TTS is imperative in appropriately treating patients.

The incidence of FDAL is 6-8% and the incidence of PCI is only 1%. The FDAL has been described with varying origin and course, with each variation causing a symptomatic tarsal tunnel syndrome.1,5-6

The FDAL is not a rare accessory muscle, but there are few reports of it as the primary etiology of TTS. This leads us to believe there must likely be another trigger or condition leading to the symptoms.1 In this case report, the associated condition was the presence of the PCI muscle. The Peroneocalcaneus Internus muscle is one of the most rarely documented accessory muscles.4-6 The PCI and the FDAL both run through the tarsal tunnel, with the FDAL medial to the neurovascular bundle and the PCI lateral to the FHL, pressing the FHL medially to abut the bundle.2,4 The presence of concomitant FDAL and PCI in the tarsal tunnel creates a significant space occupying lesion effect. Additionally, after strenuous exercise, both muscles could become edematous or hypertrophied, further compressing the nerve within the tunnel.1

While MRI cannot show the exact point of entrapment of the tibial nerve, it can help to detect space occupying lesions as well as identify selective muscle edema of which the intensity reflects the severity of nerve damage on T2 weighted images.10 In the reported case, the accessory muscles were not originally identified despite an MRI being obtained. The FDAL was identified superficially in the tarsal tunnel during surgical decompression of the nerve. While the FDAL was surgically excised, the deep PCI was not visualized and therefore not removed. A similar case of failure to identify FDAL preoperatively, despite obtaining MRI, has been reported.11 Wittmayer and Freed felt that their operative course would not have changed even if they had more closely inspected the MRI pre operatively.12 They also felt that in the face of TTS, the FDAL would be resected to the degree that the tarsal tunnel is not overcrowded and the nerve is no longer compressed.12

To date, there is only a single report of the FDAL and PCI being present concomitantly and causing a symptomatic TTS.10 Duran- Stanton described the initial injury, symptoms, and identification of both muscles on radiographs and MRI imaging, but did not discuss any treatment.10

In the present case report, we describe a patient with long standing tarsal tunnel symptoms that failed conservative management and had significant relief after decompression of the tibial nerve with flexor retinaculum release and excision of the FDAL. Despite not removing the PCI, patient reported his outcome as satisfactory. Even though TTS secondary to accessory muscles creates a long-standing nature of nerve entrapment, surgical resection of the space occupying accessory structure(s) can provide substantial relief.13

References

11. Stanton CM, Bui JT, Martin JD. Longus (FDAL). Furthermore, a second accessory structure was identified in the 4th flexor compartment consistent with Peroneocalcaneus Internus (PCI). These findings indicate both medial and lateral compartment of the tibial nerve within the tarsal tunnel. The patient had a normal postoperative course and completed 2 courses of physical therapy. He reported significant improvement of symptoms at the final 10 month post-operative visit.

Figure 1. Case patient MRI axial images (A) at the level of the ankle joint and (B) proximal to the level of the ankle joint. Both images are labeled accordingly; PT-Posterior Tibial tendon, D- Flexor Digitorum Longus tendon, N-Tibial nerve, DA- FDAL, H-Flexor Hallucis Longus tendon, P-PCI

Figure 2. Intra operative photo depicting the released flexor retinaculum (FR), exposing the FDAL overlying and wrapping around the Tibial nerve (N).

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