An Uncommon Presentation of Acquired Equinovarus Deformity

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Statement of Purpose

The treatment of Acquired Neurotrophic Foot Deformities typically requires both medical and surgical management, with participation from various medical specialties. This case report is unique in that it was treated as an out-patient with pain along the left stylet process that eventually progressed to a bilateral equinovarus deformity. The patient presented with left sciatica and pain in the lumbosacral region. We present a protocol for early identification of acquired neurotrophic foot deformity to help guide these patients with similar presentations.

Literature Review

According to literature, the most common cause of spontaneous foot drop is neuropathy of the common peroneal nerve. Foot drop presents as an inability or difficulty in lifting the foot, which is a result of weakness in the tibialis anterior muscle. It is caused by a concomitant equinovarus contraction of the plantar flexors, which is most often seen in bilateral cases. The tarsal spasticity and compensation of lumbar degenerative disease (LDD) including disc herniation and lumbar stenosis typically present with similar symptoms [1,2].

Lumbar degenerative disease resulting in damage to the lumbosacral nerve roots can impair plantar flexor contractility that presents with symptoms including pain, numbness, paresthesia, and weakness [3]. Foot drop secondary to LDD is most commonly seen at the L4/L5 or L5/S1 level [4]. Clinically, degenerative lumbar disc herniation due to disc herniation and spinal stenosis causes weakness to the lower extremity, tarsal spasticity, and decreased lumbar extensor strength, with or without back pain or paresthesia [5]. Objective external muscle weakness in patients with degenerative lumbar disc hernion can be seen in approximately 44% of patients. In patients undergoing lumbar discectomy, 53.5% of patients had muscle weakness while 29% of patients had some degree of tenderness reflexes [4,5].

The ever-growing population of diabetic patients with neuropathy, differing foot drop due to peripheral neuropathy or lumbar degenerative disease can be challenging [4]. Assessment of tarsal anterior and external extensor digitorum longus function and strength is achieved through manual testing (MMT) grading [7]. Often electromyography and nerve conduits are used to determine the presence of the cause of the neuropathy [8,9]. Preservation of the ankle jerk reflex can also be used to differentiate between isolated peroneal neuropathy and more proximal LS radiologies [7]. The recognition of symptoms and diagnosis is of utmost importance as the duration of foot drop will impact likelihood of recovery [2,10].

Case Study

A case is presented of a 54-year-old diabetic male who initially presented in 2017 complaining of left ankle pain and a flair in his left lower extremity. The patient was subsequently presented to another podiatrist, a year later sustaining a left ankle fracture, treated with immobilization. Following his fracture, the pain in his left lower extremity continued, only slightly alleviating. The patient was subsequently referred to Physical Therapy to reduce soft tissue swelling and aid with functional walking. Orthotics were initially manufactured and then prescribed to a shoe up ankle brace.

Case Study Continued

In 2017, the patient presented to us, but with progression of symptoms. He reported a feeling of instability and frequent falls. Physical exam revealed a loss of sensory sensation in the left L2, L5, S1/2, and S3 dermatomes. Upon palpation of the left, Manual muscle examination revealed muscle weakness of left extensor hallucis longus 4/5, extensor digitorum brevis extensor digitorum longus 3/5, tibialis anterior 4/5, tibialis posterior 5/5, Achilles 2/5, peroneus longus 5/5, and peroneus brevis 4/5. On stance, the patient demonstrated varus resting posture stance position, left > right. He could not come up to his toes or heels. Calcaneus varus on the right was reducible with the Cohan block test, however, could not be assessed on the left due to patient feeling weak and unstable. With subtalar joint neutral, the 1st ray was noted to be in varus on the left and in normal alignment on the right. Sensation to pinprick, sensations to light touch, and sensation to vibration were normal in the left foot. Patient was noted to have decreased sensation to buzzing sensation with indwelled ataxia test (left). About 12 months post neurosurgery, slight ankle stiffness was noted in both ankles. Inability to ambulate in ankle dorsiflexion, difficulty in ankle plantar flexion, and ankle inversion and eversion was noted due to the L5-S1 disc herniation. Development of plantar calcaneus varus on the right hip and brought the left ankle in a varus position and was noted as a left ankle equinovarus. Patient also complained of decreased dexterity, paresthesia, left ankle (Figure 6a). This was also noted upon EMG/NCV-EMG/NCV (Figure 11).

Analysis & Discussion

The equinovarus foot, regardless of origin, is a challenging condition. It is imperative to have a firm understanding of the cause before implementing surgical intervention. We present a protocol for early identification and treatment of systemic neurologic diseases. This case study emphasizes the importance of Podiatric care in early identification and treatment of systemic neurologic diseases. With proper pre-operative and post-operative care, severe disability was mitigated, however, not fully reversing.

Analysis & Discussion Continued

This case is unique in that the patient had LDD due to both spinal stenosis and disc herniation. Early recognition of LDD due to spinal stenosis and disc herniation has been shown to affect the extent of recovery and neurologic deficits. The most recent neurosurgery evaluation reported excellent surgical result with no need for further follow up. Upon successful evaluation of the patient, though improved, ambulation ability was not achieved. Due to the severity of the patient’s condition, a wide range of treatment modalities from nonsurgical to surgical treatments described in the literature for this pathology. Nonsurgical treatment options include orthotics, devices, serial casting, muscle relaxants, and phenol nerve block [10-11]. By the time of our presentation, the patient presented to us, custom orthotics and physical therapy had been attempted but significant time had also passed since the onset of the palsy. The following case has presented a clinical presentation with improvement in foot, a Posterior Leaf Spring AFO was prescribed and patient was taken to the operating room for neurosurgery.

References & Acknowledgements


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Figure 6a. Tarsal lymphangiography confirming varus. Figure 6b. Lumbosacral MR imaging demonstrating varus.

Figure 5. Case Study. Lumbosacral MR imaging demonstrating varus.

Figure 4. Case Study. Lumbosacral MR imaging demonstrating varus.

Figure 3. Case Study. Lumbosacral MR imaging demonstrating varus.

Figure 2. Case Study. Lumbosacral MR imaging demonstrating varus.

Figure 1. Case Study. Lumbosacral MR imaging demonstrating varus.

Figure 7. Case Study. Lumbosacral MR imaging demonstrating varus.

Figure 8. Ted Averill, MD, PhD. Lumbosacral MR imaging demonstrating varus.