Tibialis Anterior Muscle Hernia: A Case of Chronic, Dull Pain and Swelling in Leg Diagnosed by Dynamic Ultrasonography

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Summary

Background: Symptomatic muscle hernias are not uncommon in the lower extremities and are a rare cause of chronic leg pain. They are most commonly seen in the tibialis anterior muscle, occurring through fascial defects, usually after trauma. There are about 200 cases of muscle hernias described in the literature. The diagnosis is challenging as most of the patients present with non-specific chronic leg pain. Dynamic muscle ultrasonography at rest and at stress is often used for the diagnosis.

Case Report: We describe a case of tibialis anterior muscle hernia presenting with persistent dull pain and swelling along the anterior aspect of the leg on straining the leg muscles. Dynamic ultrasonography was performed, which showed a defect in the fascial sheath of the muscle through which the tibialis anterior muscle herniated and produced a focal bulge along the anterior aspect of the leg. Based upon physical examination and dynamic ultrasonographic findings, a diagnosis of tibialis anterior muscle hernia was made.

Conclusions: Tibialis anterior muscle hernia is a rare diagnosis and should be included in the differential diagnosis in a patient with chronic leg pain and swelling. Dynamic ultrasound is crucial in confirming the diagnosis and should be done on straining the muscles of the affected limb.

MeSH Keywords: Muscle Fibers, Skeletal • Posterior Tibial Tendon Dysfunction • Ultrasonography, Doppler, Color

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**Discussion**

Muscle hernias are focal herniations of muscle tissue through a defect in its fascial sheath. They are most commonly found in the lower extremity. They are mostly underdiagnosed or misdiagnosed as muscle hematomas and varicosities [1]. There are about 200 cases of muscle hernias described in the literature. In 1929, Hugo Ihde reported a case series of 12 patients with muscle hernias along with their classification [2].

Ihde divided muscle hernias into two groups: traumatic and constitutional. Constitutional or congenital hernias occur due to weakness in muscle fascia after chronic stress. It has been proposed that there are fenestrations in the muscle compartments through which perforating veins pass through the anterior aspect of the leg (Figure 4.).

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enter. Due to chronic stress, the fenestrations enlarge and eventually muscle hernias bulge through these openings [3]. Traumatic or acquired hernias are seen secondary to penetrating trauma, direct trauma causing closed fracture with fascial tear and indirect trauma (force applied to contracted muscle causing fascial rupture) [4]. The anterolateral tibial compartment is the commonest site due to being a superficial and tight fascial compartment [5]. A high index of suspicion and awareness of a muscle hernia helps in its early diagnosis. In the lower extremity, tibialis anterior muscle hernia is found most frequently due to the vulnerability of its fascia to trauma. The other muscles affected in the lower extremity are extensor digitorum longus, peroneus longus, peroneus brevis and gastrocnemius [6]. In our case, there was a history of blunt trauma to the leg 4 years before that might have contributed to muscle hernia.

On clinical examination, muscle hernia may present as a palpable bulge, soft tissue mass or subcutaneous nodule. The muscle typically herniates during leg dorsiflexion, also known as “fencer’s lunge” position” [7]. The swelling reduces when the patient is supine or the muscle is relaxed. Although the clinical picture points towards the diagnosis, imaging, especially ultrasound, should be used to confirm it. The differential diagnosis of muscle hernias include varicosities, angiomas, arteriovenous malformation, lipomas, ruptured muscle (a pseudohernia) and soft tissue tumours [4]. However, these tumours do not show movement on changing the patient position. Dynamic sonography is diagnostic in detecting a myofascial defect and can confirm the diagnosis. Dynamic sonography can detect a muscle bulge through the fascial defect on muscle contraction and its retraction on relaxation. Sonography is advantageous as it is a real-time modality, so that muscle herniation is detected during a dynamic examination, and the nature of lesion can be shown to the patient, which is reassuring. The examination is done in a standing position or by contracting the muscle [8].

A 3D scan allows for a better delineation of fascial defects with a proper placement of the reference point. A 3D scan highlights the muscle herniation and makes hernia easy to see [9]. MRI is useful in equivocal USG findings and confirms muscle herniations with a better musculofascial demarcation [10]. There is no ideal treatment for muscle herniations described in the literature. Most hernias are asymptomatic and require only reassurance. Mildly symptomatic hernias are treated conservatively with rest, restriction of exercise and the use of compression stockings. Various surgical techniques for symptomatic hernias include decompressive fasciotomy, primary fascial repair – including direct closure of the defect, closure of the defect using autologous or synthetic grafts etc. [11].

Conclusions

Tibialis anterior muscle hernia is a rare diagnosis and should be considered in the differential diagnosis in a patient with chronic leg pain and swelling. Dynamic ultrasound is crucial in confirming the diagnosis and should be done on straining the muscles of the affected limb.

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