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Case Report Open Access

# A Rare Finding of Symptomatic Bilateral Lower Extremity Hernia

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**Abstract**

A muscle hernia of the lower extremity can occur when the overlying fascia has become weakened. Often it is diagnosed clinically as a soft bulge on active movement and can be confirmed by ultrasound or MRI. If conservative treatment is not effective, surgical fascial reinforcement is required for either cosmetic reasons or clinically symptomatic patients. We are presenting a case of symptomatic, bilateral lower extremity hernias.

**Keywords:** Lower extremity hernia; Hernia; Fascial weakness

## Intoduction

The etymology of the word Hernia is of Latin origin and is a noun that means "a rupture". Scientifically, the term is applied to conditions in which a tissue has projected through another structure or organ. These protrusions occur in regions where the fascia, a retaining structure that provides support and enclosure for the structures contained within, of the affected object has become weak or is insufficient. These weak locations can be identified as such, due to the fact that they are often perforated by vessels and nerves.

## Case Report

A 28-year old otherwise healthy male presented with a history of intermittent bulging over the lower third of bilateral lower extremities, which had been present for 14 years. The bulging causes intermittent pain with ankle dorsiflexion, on right more than left. This limited the patient's ability to exercise specially while running. The bulge increased in size gradually over the years and the patient did not recall any history of trauma to these areas. Conservative treatment in form of elastic stockings did not alleviate his symptoms.

On clinical exam in standing position there was a soft, non-tender, reducible swelling appreciated along the anterior lateral aspect of the lower third of bilateral lower extremities, measuring 3×3 cm on the right and 2×2 cm on the left. The bulging areas were non-pulsatile and the overlying skin was intact without redness, discharge, or signs of inflammation. The neurovascular exam of both lower extremities including feet was intact. Both ankles showed full range of motion and a fascial defect at the area of concern was palpable upon dorsiflexion of the ankle with the defect on the right side being larger than on the left (Figures 1-3).

The patient was found to be a good candidate for surgical repair of fascial defects in a staged fashion, starting with the right lower extremity. Informed consent was obtained. Patient was marked in the preoperative holding area in the standing position, with the ankle in dorsiflexion. A vertical incision overlying the hernia defect was made and the dissection was carried toward the area of interest. The fascial defect was identified in the right retinaculum of the extensor muscle. Repair was performed with a Core Dual plus Biomaterial mesh in underlay fashion. The mesh was secured in place with 3-0 PDS simple interrupted sutures. The skin was then closed in a layered fashion (Figure 5). The patient recovered well and gradually resumed his preoperative exercise program one month after the procedure. Sixteen months after the surgery, the symptoms of pain with running had almost fully resolved.

Imaging of the bulging areas in the form of a MRI was performed and contrary to clinical exam findings, no hernia defect or evidence of a mass was found on either lower extremity (Figure 4).

The left lower extremity fascial defect was repaired seventeen months after the contralateral extremity using the same technique. The fascial defect measured 3x4 cm and was repaired with a Core Dual plus mesh using an underlay technique.

His postoperative course was uneventful with some residual swelling in the area of repair. Long-term follow up is warranted.

**Figure 1:** Bilateral lower extremity

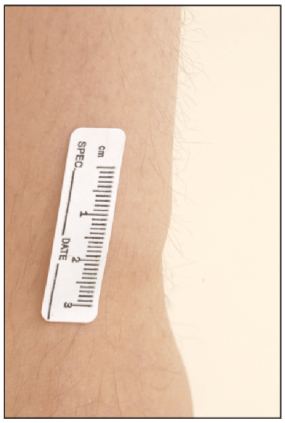

**Figure 2:** Left lower extremity

**Figure 3:** Right lower extremity

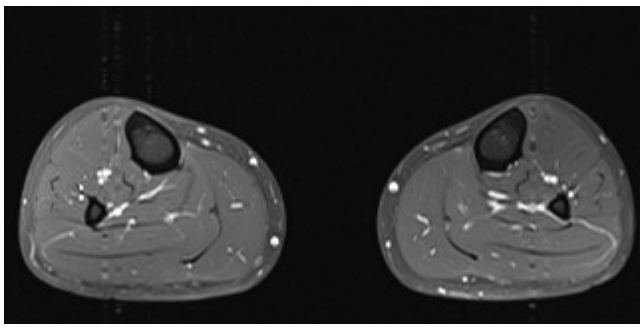

**Figure 4:** Preop MRI

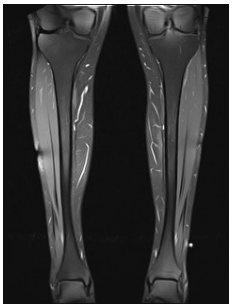

**Figure 5:** Fascial repair with underlay mesh left lower extremity

## Discussion

A muscle hernia occurs when muscle tissue obtrudes through a point of weakness in the fascia. Literature on muscle hernias is quite limited. Usually asymptomatic, these defects are frequently underreported making it difficult to accurately determine their prevalence [1,2]. Occurrence is higher in the lower extremities compared to the upper extremities [3]. Muscle hernias can be congenital, acquired, or spontaneous. Congenital hernias are associated with changes in the metabolism of elastic fibers and collagen [4]. Defects in the mesoderm, marked by uncoordinated muscle contractions can lead to weakness and ruptures of the fascia. Of those cases that are congenital, muscle hernias also become prevalent in the family history [5] and are usually bilateral [6]. Nonetheless, acquired hernias are more common than congenital ones [2]. Common causes of acquired henias are: senility, smoking, iatrogenic, traumatic, and infective. Senility and smoking cause loosening of the fascia, which could facilitate subsequent rupturing [7,8]. Trauma can also cause violation of this fascial layer. Other types of hernias are of spontaneous origin. These occur due to chronic stress on the muscles such as vigorous exercise. The latter is commonly seen in athletes and soldiers [5]. Such constant stress causes muscle hypertrophy, which in turn puts undue pressure on the fascia [9].

The most common and also first described hernia in the lower extremity is that of the anterior tibialis muscle [5]. Other types of hernias include those of the gastrocnemius [2], peroneus longus [10], peroneus brevis [11], and abductor hallucis muscles [12]. Patients often present with either asymptomatic or symptomatic hernias [10,11,13-15]. The majority are asymptomatic and would only present with localized, soft, painless swelling of the muscle. Conversely, should they show symptoms, they usually consist of pain, cramping or tender swelling after lengthy activity. Such swelling decreases upon relaxation, with a few reports of pain diminution upon contraction [16].

Differential diagnoses for these hernias include lipomas, hematomas, muscle tears, varicosities, soft tissue tumors or ankle strain [5,12,13].

Usually a hernia can be diagnosed through palpation during a physical exam. A small superficial lump can be felt in the affected region; the lump becomes firm and prominent with contraction of the muscle. Should a physical exam prove insufficient [5,13], a sonogram or an MRI can show fascial insufficiencies and eliminate other diagnostic possibilities [9].

For most hernias, which tend to be asymptomatic, the first course of treatments is conservative [16]. This includes elastic support, restriction of exercise and pain medicine. Should this not be sufficient, for severe symptoms or for cosmetic reasons, there are four surgical options [2,9]. The first is a primary closure of the fascia, being most effective for small defects [9,17-19]. This procedure must be done carefully, keeping in mind that too much tension to the underlying structures can cause acute compartment syndrome and may lead to a recurring injury. The second route is to open the fascia distally and proximally. The downside to this procedure is that it may cause a localized skin depression when the muscle contracts due to adhesion between the muscle and subcutaneous tissue [12,18,20,21]. Furthermore, evidence suggests that this may also cause a thinning of the underlying subcutaneous tissue near and at the site of the hernia [9]. The third option is to decrease the volume of the muscle by removing a part of it. This however, reduces normal and functional muscle tissue. The final method involves the use of a patch to repair the hernia. This patch can be either autologous or synthetic. The autologous patch can be either a periosteal flap, fascia lata or dermal graft. The periosteal flap is problematic since it can only be used to repair defects of less than 3-4 cm and requires extensive surgery. The fascia lata patch also presents a problem as it leaves a large scar on the lateral thigh [22,23]. Finally, the dermal graft has the disadvantage of leaving damage at the donor site, causing epithelial cysts, atrophy and progressive relaxation of the graft. Synthetic grafts, on the other hand, have shown to be more effective [3,24]. Nevertheless, it is of outmost importance to use a mesh graft that will allow the muscle to glide on a smooth surface without any significant opposition by friction from the patch margins or sutures.

To the authors knowledge, there is no study directly comparing the different repairs in terms of effectiveness and overall complication rate. One of the largest series looking at outcomes of repair includes only one surgical technique, that of simple fasciotomy [25]. Advocates of the latter, warn about the possible complication of compartment syndrome or tissue necrosis that might occur with other methods of reconstruction. While repairs with synthetic materials have been described with great success most of these are only presented as case reports.

## Conclusion

Muscle hernias have not been extensively reported and explored in the medical literature. With the general public becoming increasingly more aware of physical fitness, plastic and orthopedic surgeons are encountering more of these cases. The deficiency in reported cases of lower extremity muscle hernias may be a consequence of most being asymptomatic. Likewise, most bilateral hernia defects are symmetrical making it clinically difficult to make a baseline comparison with each patient [14]. Considering that other conditions in the differential diagnoses are much more common, muscle hernias might be often overlooked. Contributing to this, with MRI obtained in the supine position most hernias could likely not be seen. These confounding factors should be taken into account by clinical practitioners in an effort to more accurately diagnose muscle hernias.

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