CASE REPORT

Tibialis anterior muscle hernia: rare but not uncommon

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SUMMARY

Muscular hernias in the lower limb are a rare entity that have seldom been described in the literature, to the extent that the seminal paper on the subject remains a case series from 1929. Here, we present a case of tibialis anterior muscle hernia and discuss the aetiology behind the same. Furthermore, we attempt to amalgamate existing knowledge to provide some guidance for investigation and management of this important diagnostic consideration.

BACKGROUND

The term 'hernia' describes any protrusion of a tissue contained within a cavity through the wall of the cavity that contains it. By and large, the term hernia is synonymous with one present in the abdomen, though those in the lower limb have been described as 'not uncommon'.¹ Here, we present a rare case of a hernia through the tibialis anterior muscle of the lower limb, likely the first reported case in the Kingdom of Bahrain.

The investigations and differential diagnoses that were considered during the work-up of this patient's lower limb swelling may aid in streamlining the diagnostic and management approach of a similar lower limb swelling that does not meet the characteristics of a more common diagnosis. Furthermore, we aim to correlate the few reported cases of this hernia in the literature to seek any common features in the history to understand its aetiology.

CASE PRESENTATION

This is a case of a 34-year-old man with no significant medical or surgical history, who presented with 4-year history of swelling over the left lower anterior aspect of the shin. The swelling was non-progressive in terms of size. The patient is employed as a policeman, and is a regular football player. He had initially been asymptomatic; however, over the preceding 5 months he began reporting of persistent pain of the swelling.

On examination, a 2×2 cm round swelling was noted. It was found to be reducible, non-tender, non-erythematous, non-ulcerated, produced no discharge and was not associated with any lower limb oedema. No obvious varicose veins were noted. The mass spontaneously reduced on lying down, and protruded on standing. It is shown in [figures 1 and 2](#).

An X-ray of the lower limbs found no abnormalities. The swelling was also aspirated, but found no fluid or bloody contents. An ultrasound scan of the

Figure 1 The gross appearance of the patient's lower limb swelling.

lower limbs was then requested. The findings were of a small superficial subcutaneous focal area (2×4 mm) of low echogenicity seen at the antero-lateral lower aspect of left leg suggestive of fluid collection that was likely loculated, with no obvious vascularity seen. The image is shown below ([figure 3](#)). MRI of the lower limb was also performed and no abnormalities were observed.

INVESTIGATIONS

1. Ultrasound of the lower limbs
2. X-ray of the left leg
3. MRI of the lower limbs

DIFFERENTIAL DIAGNOSIS

- ▶ Lipoma
- ▶ Sebaceous cyst
- ▶ Varicose vein
- ▶ Arteriovenous malformation
- ▶ Dermatofibroma
- ▶ Tibialis anterior muscle hernia

TREATMENT

The patient was treated conservatively for 3 months with watchful waiting and regular follow-up. Despite this, the patient remained

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Figure 2 An anterior view of the gross appearance of the lower limb swelling.

symptomatic, after which surgical exploration was offered to the patient. An intraoperative photograph of the herniation is shown (figure 4).

He underwent a surgical exploration in which a vertical incision was made performed over the swelling, on the anterolateral aspect the left shin. On opening, the fascial defect was identified by palpation. The herniation matter was visible, and found to be subcutaneous fat, with an underlying defect on the tibialis anterior muscle. It was roughly 1 cm in diameter.

Figure 3 The ultrasound image of the swelling showing a subcutaneous fluid collection.

The fascial defect was repaired primarily with non-absorbable Ethilon sutures, with simple interrupted stitches. The skin was closed with 2/0 Prolene sutures used to form subcuticular sutures. Opsite dressing was applied to complete the procedure.

OUTCOME AND FOLLOW-UP

Following the surgery, the patient was able to weight bear the next day. He received no special instructions regarding rest or avoiding particular activities. The patient followed up in the clinic at 1 and 2 weeks postoperative. He was doing well, with no pain or swelling over the repaired area. He was ambulatory and walked to the clinic with no symptoms. He reported that he had returned to work after 3 days following his surgery and was satisfied with the results.

DISCUSSION

A hernia is a protrusion of a tissue through an abnormal defect in the wall of the cavity that contains it. Muscular hernias are uncommon; however, they occur most frequently in the lower limbs compared with elsewhere in the body. In particular, the anterolateral tibial compartment tends to be affected, likely because of the superficiality and tightness of the fascial compartment.^{2 3}

The reported literature on this type of hernia unanimously credits the work of Ihde, a Swedish surgeon who described a case series in 1929. Ihde described two types of lower limb hernias: 'constitutional' and 'traumatic'. He described the former to be caused by mesodermal weakness, and the latter to be due to open or closed trauma or overuse, such as in soldiers or athletes.⁴ In our case presented here, this classification remains appropriate, and the patient likely falls into the traumatic category, having documented risk factors for overuse, as he is a policeman and a regular football player.

Patients can present either with an asymptomatic swelling, or a vague painful swelling. The same paper by Nguyen *et al*² reported on a case of a veteran in whom the hernia caused compression of the superficial peroneal nerve, which is a potential sequel of a tibialis anterior hernia that has been reported, but was not encountered here.

A detailed history and a complete physical examination combined with appropriate imaging may narrow the differential diagnoses to include a tibialis anterior hernia. Of all the available imaging modalities, dynamic ultrasound has been reported to be most useful in confirming the diagnosis and avoiding unnecessary biopsies.⁵

Figure 4 Intraoperative image showing the muscle herniation through the tibialis anterior.

Once the diagnosis is confirmed, the management hinges on the presence of symptoms (pain, size of the defect, cosmetic appearance, etc). Asymptomatic patients may be treated with reassurance and conservative management. For patients who are symptomatic, surgical treatment is indicated. Lewis *et al*¹ have discussed surgical methods in correcting such hernias: open direct closure, and a longitudinal fasciotomy with or without a graft/synthetic mesh. In our case, open direct closure was chosen.

Miniaci and Rorabeck⁶ in their report of a tibialis anterior hernia encountered compartment syndrome and death of the anterior compartment with open direct closure. Thus, Lewis *et al* opine that a longitudinal fasciotomy is the preferred method of management to avoid this complication, and also

state that this method produces superior cosmetic results. As in our case, small defects can be repaired by direct closure, whereas larger defects may have better outcomes with a longitudinal fasciotomy with or without a graft.³ Nguyen *et al*² in a later paper state, however, that there is no consensus on the optimal surgical method.

Our experience with this patient is that open direct closure produces satisfactory cosmetic results, and we did not encounter the complication of compartment syndrome, thus adding to the dissension on the optimal surgical method.

Learning points

- ▶ Lower limb hernias are rare but not unheard of, and should be considered as a differential for unidentified lower limb swellings.
- ▶ Risk factors include open or closed lower limb trauma, and overuse of the lower limbs such as in soldiers, athletes, etc.
- ▶ There is no clear consensus in the limited literature on the optimal way to correct the hernia surgically.

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