CASE REPORT

Localized hypertrophy of the semimembranosus muscle in a young athlete: A case report

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Summary Popliteal fossa and distal thigh swellings have many causes in young active adult. Cysts are the main cause, but they may also evolve from fatty tissue, lymph nodes or the popliteal artery. Semimembranosus muscle hypertrophy, found in athletes and young active adults, is only rarely the main or only cause of swelling, and only four such cases are reported in the literature. The present article reports our experience in the management of a case of semimembranosus hypertrophy as the only cause of a swelling above the popliteal fossa, and its favorable evolution.

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Introduction

Swellings of the popliteal fossa and distal thigh are very common in young active patients; Baker’s cyst or muscle tear is often implicated, as is lipoma in older patients, and popliteal aneurysm after knee surgery, or enlargement of the lymph nodes in general pathologies.

This report describes the case of a young athlete presenting with a swelling above the popliteal fossa. Rigorous clinical examination, radiology and surgical exploration found only hypertrophy of the semimembranosus muscle.

Only four such cases have been reported in the literature, to the best of our knowledge [1,2]. We therefore seek to pinpoint the essentials of diagnosis of localized hypertrophy of the semimembranosus muscle, with a view to avoiding misdiagnosis pointless surgery.

Case report

A 16-year old girl complained of a painful swelling in the distal right thigh on the medial posterior side, above the popliteal fossa (Fig. 1). The swelling was bilateral but more pronounced on the right side. Only the right side was painful. The swelling had appeared 2 years previously, and gradually increased in size and painfulness. There was no history
of trauma, despite the fact that the patient played several sports including athletics and intensive horse-riding.

The pain was continuous, increased by physical exercise and decreased by rest.

The patient had already taken several medical opinions, but with no diagnosis.

Physical examination showed a soft, mobile, well-circumscribed painful swelling in the postero-medial part of the distal thigh, above the popliteal fossa. Size and consistency were increased by active knee flexion. The swelling measured 4 × 2 cm. Clinical knee examination was normal. Radiography did not reveal any bone abnormality. Soft-tissue ultrasonography revealed only focal hypertrophy of the semimembranosus muscle. The superficial aponeurosis was intact. Muscle hernia, cyst and bursitis were excluded. MRI was normal.

Resting CT was normal, excluding muscle hernia through the aponeurosis.

Conservative treatment was undertaken, based on oral anti-inflammatory drugs, rest, local infiltration and physical therapy (stretching). Improvement in pain was short-lived. Surgical exploration under general anesthesia was therefore performed in 2005, but found no abnormality; the semimembranosus muscle and other neighboring structures seemed intact.

After a few months of regression of pain, the patient returned with persistent swelling and recurrence of pain.

A second CT scan, under contraction phase, showed localized right semimembranosus hypertrophy (Fig. 2).

The patient’s demands were strong, and it was decided to perform surgical exploration under local anesthesia, following Symeonides and Passchaloglou [1], allowing peri-operative discussion and interaction with the patient. Incision of the fascia showed localized semimembranosus hypertrophy protrusion (Fig. 3). Muscle hernia was excluded as the fascia was intact. The hypertrophic part of the muscle was removed and the resulting gap was closed with simple

![Figure 1](image1.png)  Swelling on posterior side of right thigh.

![Figure 2](image2.png)  CT scan: semimembranosus hypertrophy on the right side under contraction phase (↑).

![Figure 3](image3.png)  Peroperative view under local anesthesia (contraction phase).
Localized semimembranosus hypertrophy

non-constrictive sutures to "tubulize" the residual muscle mass. Postoperative course was pain-free, with no recurrence of symptoms on regular follow-up until late 2009. The histological examination showed only hypertrophic muscle fibers, without signs of malignancy.

In 2012, the patient was reassessed during a routine consultation that revealed partial recurrence of the swelling, probably due to hypertrophy of the remaining muscular fibers. The swelling was, however, completely pain-free.

Discussion

Clinical and radiological examination [3,4] and surgical exploration diagnosed hypertrophic semimembranosus complex. This explains why the first surgical procedure, performed under general anesthesia, showed no abnormality. It also explains why the second procedure, performed under local anesthesia, allowing active contraction, was able to demonstrate the muscle hypertrophy; the increased size and hardening of the swelling was manifest.

Semimembranosus hypertrophy as sole etiology of popliteal fossa swelling is rare and the literature is sparse. The most common etiology is Baker’s cyst. Other frequently observed conditions include adenopathies, lipoma, popliteal artery aneurysm, neuroma, complete or partial muscle tear, avulsion, fracture and bursitis [5]. None of these was at any point observed in our young patient. Popliteal cyst could be excluded by the clinical and radiological findings [3,4].

Only four cases [1,2] have been reported of young active patients presenting popliteal fossa swelling with no proven etiology except semimembranosus hypertrophy. The condition is benign. Etiology is unknown, although it may be due to the oblique direction of the semimembranosus fibers in this region [2]. Although the literature on the subject is poor, semimembranosus hypertrophy should be a part of differential diagnosis for popliteal fossa swellings in young active patients. It should be considered in absence of signs of inflammation and when the swelling is mobile, soft at rest and hardening under active contraction.

Conservative treatment is based on anti-inflammatory drugs, rest, local infiltration and physical therapy including stretching exercises. Surgery under general anesthesia should be avoided. Surgery under local anesthesia should be reserved to cases of failure of medical treatment with persistence or recurrence of the symptomatology. Partial recurrence of the swelling after a few years is probably due to hypertrophy of the remaining muscle fibers. The patient should be aware of this possibility.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

References