Available online at www.sciencedirect.com
ScienceDirect
Foot and Ankle Surgery 14 (2008) 43–46
FOOT AND ANKLE SURGERY
www.elsevier.com/locate/fas

Case report

Hypertrophy of the abductor digiti minimi muscle simulating a localised soft tissue mass

Peter Raab *, Volker Ettl, Agniezka Kozuch, Ulrich Nöth

University of Wuerzburg, Department of Orthopedic Surgery, König-Ludwig-Haus, Brettreichstr. 11, 97074 Würzburg, Germany

Received 13 April 2007; received in revised form 2 August 2007; accepted 14 August 2007

Abstract

Soft tissue tumours of the foot are rare and often present a difficult clinical and diagnostic situation. We report of a 15-year-old male with a painless swelling at the lateral margin of the left foot. After X-ray and MRI an excisional biopsy was performed. Histology revealed true muscle hypertrophy without myopathic or degenerative changes, consistent with the diagnosis of congenital hypertrophy of the abductor digiti minimi muscle. At a follow-up of one and a half year there was no recurrence and the patient was satisfied with the shape and the appearance of the foot.

Keywords: Soft tissue tumour; Foot; Muscle hypertrophy; Abductor digiti minimi muscle

1. Introduction

Soft tissue masses of the foot are rare and present a clinical and diagnostic problem when the cause is not apparent. Fluctuant lesions, like lymphangioma can be classified clinically, but confirmation involving further imaging techniques might be necessary. When the mass is clinically solid, there is concern about the possibility of a malignant soft tissue tumour. The indication for surgical therapy can be pain, discomfort, and functional impairment, but in most of the cases it is to rule out malignancy. Here, a case of a patient with a solid soft tissue mass of the forefoot caused by a hypertrophic abductor digiti minimi muscle is presented.

2. Case report

A 15-year-old male with painless swelling involving the lateral aspect of his left foot was presented by his parents (Fig. 1). The mass had been present since the age of nine and there was no history of congenital anomalies or muscle diseases. The clinical examination revealed a soft tissue tumour at the lateral margin of the left foot without tenderness on palpation, and without transillumination inspected by a flashlight. The patient had no functional impairment, but the considerable size of the deformity, the discomfort in wearing shoes, and a family history of musculoskeletal cancer were of major concern.

Radiographs of the foot showed an enlarged soft tissue contour but a regular bone formation. Ultrasound and magnetic resonance imaging (MRI) revealed a hypertrophy of the abductor digiti minimi muscle with minimal uptake of contrast agent (gadolinium), similar as seen under inflammatory conditions. The enhanced signal in the T1-weighted images was diffuse, but the margin of the muscle was preserved and there was no infiltration of the surrounding tissue (Fig. 2a and b).

The case was discussed in the interdisciplinary tumour conference of the University of Wuerzburg with the decision to perform an excisional biopsy. Under general anaesthesia and tourniquet control surgical exploration showed an enlarged abductor digiti minimi muscle consisting of macroscopically normal muscle fibres (Fig. 3). In accordance to the MRI, the plantar-lateral part of the muscle was excised and the specimen was sent for histological analysis.

* Corresponding author. Tel.: +49 931 8030; fax: +49 931 1129.
E-mail address: p-raab.klh@mail.uni-wuerzburg.de (P. Raab).

1268-7731/$ – see front matter
doi:10.1016/j.fas.2007.08.006

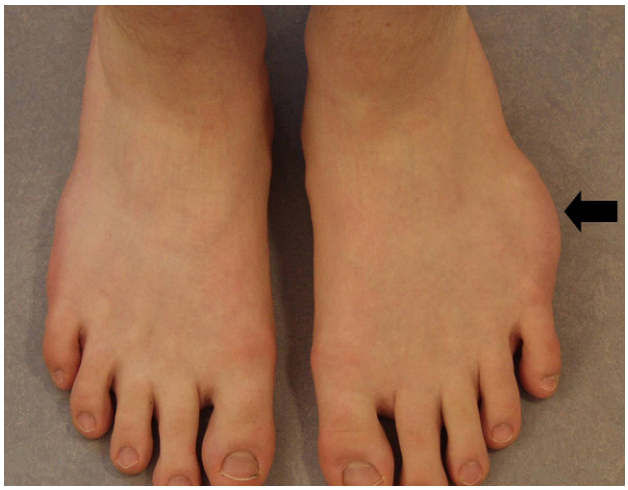

Fig. 1. Clinical appearance of the soft tissue mass at the lateral aspect of the left foot.

The microscopic picture showed major structural changes in terms of different calibres of the muscle fibres. Numerous hypertrophic fibres could be detected with a calibre exceeding 100 μm next to some atrophic fibres (Fig. 4). Target fibres were not present. Histological staining with HE revealed small areas of fibrosis and lymphocytic infiltration.

After surgery the foot was immobilised for 2 weeks to secure wound healing. After that, the patient progressed from partial to full weight bearing over the next 2 weeks. At a follow-up of one and a half year no scar contracture was observed and the patient had experienced no functional problems. Moreover, he was satisfied with the shape and appearance of the foot and the ability to wear regular shoes.

3. Discussion

Asymmetrical localised muscle hypertrophy is a very uncommon disease. It is known that this type of hypertrophy can occur as a result of excessive activity of muscle groups in very athletic children, which was not the case in our patient [1]. In pseudohypertrophy secondary to muscular dystrophy, there is symmetrical prominence of various muscle groups like the well-known calf hypertrophy in Duchenne's disease [2]. In partial gigantism, the hypertrophy involves both, bone and soft tissue [3]. In rare cases, abnormal muscles, like an accessory soleus or flexor digitorum longus muscle, can simulate a soft tissue tumour of the foot [4–6].

To distinguish between muscle hypertrophy, pseudohypertrophy and benign or malignant neoplasms clinical examination and radiographs alone are not sufficient enough. Conventional radiographs of a soft tissue mass, unlike that of a bone tumour, usually do not provide any diagnostic information, and there is no simple diagnostic test that helps the physician to distinguish between a malignant and a benign tumour [7]. Therefore, additional diagnostic imaging is needed. Ultrasound and MRI can often reliably

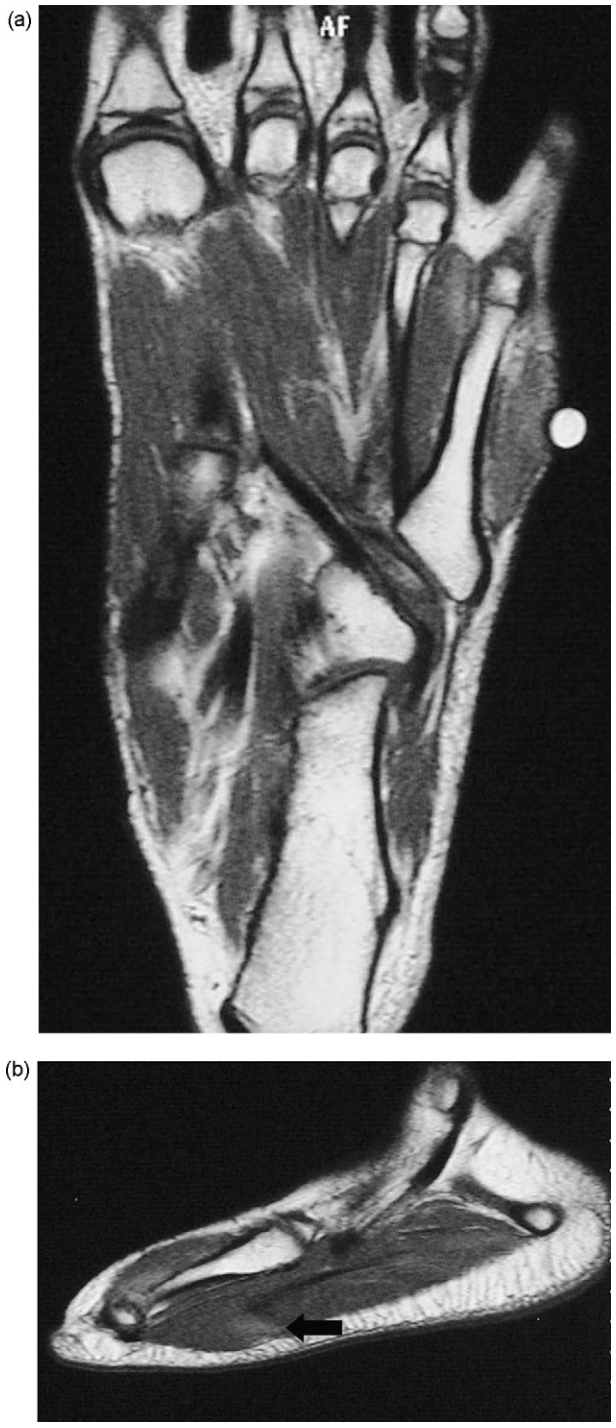

Fig. 2. (a and b) MRI scans showing the abnormal uptake of the abductor digiti minimi muscle with localised contrast agent uptake (round marker on the lateral side of the foot).

visualise the soft tissue mass and may help to characterise the origin of the tissue. Even when tissue characterisation is possible, histological verification is required for definitive diagnosis [8]. An open biopsy might be incisional or excisional. An incisional biopsy is most common and is the procedure of choice for almost all malignant tumours, because it involves less local tumour cell spreading. The