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Fibroma of tendon sheath in the distal metatarsal region of foot mimicking GCT of tendon sheath: A rare tumor

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Abstract

Rationale: Fibroma of tendon sheath is a rare benign tumor that is attached to the tendon sheath.

Patient concerns: A 16-year-old boy presented with a painless mass in his right foot, which was initially misdiagnosed as a giant cell tumor of the tendon sheath.

Diagnosis: Fibroma of tendon sheath, which exhibited radiographic features similar to those of giant cell tumor of tendon sheath. Excisional biopsy demonstrated spindle-shaped cells and collagen-like stroma.

Interventions: The patient underwent excision biopsy.

Outcomes: The patient recovered well and showed no signs of recurrence at 6-month follow-up.

Lessons: This case provides valuable insights for foot and ankle surgeons. While radiological investigations are helpful in many diseases, histological examination is indispensable for establishment of the final diagnosis.

Abbreviations: FTS = fibroma of tendon sheath, MRI = magnetic resonance imaging. GCTTS = giant cell tumor of tendon sheath.

Keywords: Differential diagnosis, giant cell tumor of tendon sheath, fibroma of tendon sheath

1. Introduction

Fibroma of tendon sheath is an uncommon benign soft tissue tumor. It usually affects the finger, hand and wrist^[1]. It is rare to present in the foot. This disease was first described by Geschichter and Copeland in 1949^[2]. The tumor is usually found in males and between the age group of 20 to 50 years^[3]. The largest study till date on FTS was by Chung and Enzinger in 1979. They reported 138 cases, in their series, 98% of the lesions were in the extremities, and 82% were in the upper extremities. Five cases occurred in the foot and four of them demonstrated that the tumor was located in the plantar region^[4]. FTS in the foot is very rare, can be hard to distinguish from other lesions and is very rarely reported in literature. Here we report a case of fibroma of tendon sheath arising in the foot in a location previously hardly documented, specifically extra-articularly between the distal metatarsal region and the proximal phalangeal region of the foot in a 16 year old male involving the tendons of the extensor digitorum longus of the right foot extending from the dorsum to the plantar aspect of the foot through the intermetatarsal spaces.

The radiographic features mimicked those of GCT of tendon sheath in the MRI T1 & T2 images. This situation is extremely rare and has not been reported before. Histo-pathologically, FTS is characterized by fibroblasts surrounded by collagen fibers, which form a dense stroma^[5]. Besides the pathological results, the diagnosis of FTS is difficult because the lesions share many features with other tumors, especially giant cell tumor of the tendon sheath. However, because FTS is frequently attached to the tendon sheath, it is easy to distinguish from cartilage or bone tumors^[6].

2. Case report

A 16-year-old Indian boy was referred to the foot clinic of our institution with a painless mass in his right foot. He had a history of injury to right foot sustained 1 year back due to trivial fall.

The swelling was of insidious onset, gradual in progression, painless. There was no rest pain. There was no significant medical history. On examination, there was a well defined swelling over the right foot at the distal metatarsal region with a palpable subcutaneous mass (diameter: approximately 4cm); the mass was non tender, firm in consistency, surface was lobulated, non-fluctuant, margins were well defined and there was no obvious deformity (Fig. 1). The skin over the swelling was pinchable without any abnormalities. The function of the right foot was normal and there was no loss of sensation in any of the toes of the right foot. The toes had full range of active and passive movements. The movements of the toes were pain free. The initial diagnosis was GCT of the tendon sheath.

The patient had undergone X- ray, MRI and FNAC elsewhere. X-ray of the right foot did not demonstrate any bony abnormality (Fig.2A). On magnetic resonance imaging (MRI), the lesion exhibited hypointensity on T1- weighted images and appeared hypointense on T2-weighted images (Fig.3a, b). These imaging findings were consistent with the diagnosis of GCT of the tendon sheath. The FNAC report showed scattered inflammatory cells composed of polymorphs and lymphocytes in a haemorrhagic background. MRI report mentioned T1/T2 hypointense lobulated lesion measuring 31 x 22 mm in the distal foot in the distal metatarsal region and proximal phalangeal region around the 2,3 and 4th interdigital region. There was No evidence of bone marrow edema. On Doppler correlation no significant vascularity was noted in the lesion. The patient underwent excision biopsy and the lesion was resected in toto and sent for histopathological examination. A straight longitudinal incision of 8cm length was made over the 3rd metatarsal tough which the mass was resected in toto. The mass (size:6cm x 6cm x 2.5cm) The mass was whitish in colour, encapsulated, firm and tough in consistency with lobulated surface, well delineated from the surrounding structures. The tendons were traversing the tumor in their usual paths and the mass was freely gliding on the tendons once it was dissected out from the surrounding tissues. The tumor had circumferentially covered the 2nd 3rd and 4th toe extensor tendons and was extending from the dorsal aspect to the plantar aspects of the intermetatarsal spaces. The tumor was resected along with the 2nd 3rd and 4th extensors tendon sheaths and capsule. The tendons were retained. The dead space was irrigated with saline and was not filled with any spacers. The wound was closed over a suction drain. Histopathological examination revealed fairly encapsulated lobulated lesion composed of

fibroblast cells in a dense collagenous stroma with focal hyalinization with interspersed blood vessels and focal myxoid change. The cut surface showed grey white solid area. No giant cells or inflammatory cells were identified. No significant cellular atypia. A diagnosis of fibroma of tendon sheath was established.

At 6-month follow-up, the surgical wound had healed well with no signs of recurrence. Micrographic images show a well encapsulated lobulated mass edematous collagen-like stroma, spindle shaped cells with unclear lobulated structure, hyaline degeneration, insignificant cell atypia, and a small amount of mitoses (Fig.2a, 2b). No giant cells or inflammatory cells were identified. Spindle shaped fibroblast were seen. A diagnosis of fibroma of tendon sheath was established. At 6-month follow-up, the surgical wound had healed well with no signs of recurrence.



Fig 1a 1b: The external appearance of the lesion.

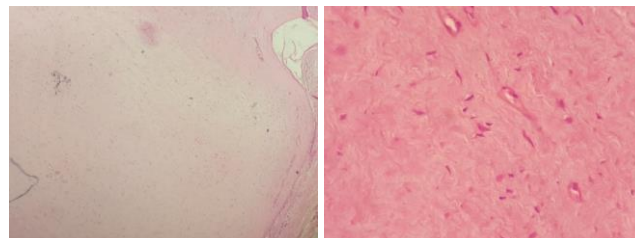


Fig 2a:2b:2a: low-magnification (40) photomicrograph of hematoxylin-eosin stained section showing eosinophilic stroma and spindle-shaped cells; 2 b high-magnification (200) photo micrograph of hematoxylin-eosin stained section showing spindle-shaped cells with mitoses



Fig 3a: X-ray foot. MRI shows hypointense on T2-weighted images (B) and on T1-weighted images (C). MRI = magnetic resonance imaging.



Fig 4: Plan of Incision (A) Intraoperative appearance of the tumor; (B) gross appearance of the surgical specimen; (C) Specimen after excision.



Fig 5: The Foot after 6 months follow up

3. Discussion

The case reported is extremely unusual. The tumor presented without pain and was insidious in onset, gradually progressive in nature, involved the distal metatarsal region and proximal phalangeal region enveloping the 2nd 3rd and 4th extensor tendons reaching up to the plantar floor through the intermetatarsal spaces. To the best of our knowledge, a case of FTS mimicking a GCT of tendon sheath has not been reported till date. FTS is a slow growing benign tumor which may occur anywhere in the body, especially in fingers, hands, and wrists. The tumor is more common in men in the age-group of 20 to 50 years. Our patient was a 17 year-old boy who had tumor in his foot, which is very peculiar. The typical approach involves marginal excision of the lesion with or without removal of the adjacent structures [5].

In our case, the mass was well-delineated from the surrounding tissues and the tendons were freely gliding even though enveloped by the tumor. Besides, the risk of malignant

degeneration of FTS is extremely low; therefore, we resected the lesion without the tendons to preserve the function of the toes. Though we excised the tendon sheaths with the tumor, the patient showed no signs of recurrence at 6-month follow-up. Differentiation of FTS from others of soft tissue masses in the foot is important; however, most FTS are attached to a tendon or tendon sheath, which clearly distinguishes it from tumors arising from bone and cartilage. FTS needs to be differentiated from GCTTS (giant cell tumor of tendon sheath). Both are benign, slow-growing tumor [1, 7] Both are similar in size, location and gross appearance.

Histologically GCTTS is composed of multinucleated giant cells, histiocytes polyhedral, fibrotic material and hemosiderin deposits [8-10] histological aspects such as the cellularity and mitosis does not seem to affect the prognosis of cancer [11-13]. Microscopically all tumors contained multinucleated giant cells, histiocytes and haemosiderin in deposits. It is a slowly growing, usually painless benign lesion of soft tissues. The tumor affects individuals between the age of 30 and 50 years old and is found more often in women than men [14-17]. Despite its benign character, local recurrence after excision has been reported in up to 45% of cases [18] there isn't still a defined treatment protocol and local excision with or without radiotherapy is the treatment of choice to date. GCTTS mostly occurs in the toes [19, 20] Satti *et al.* suggested the pathological study between FTS and GCTTS is difficult to identify²¹. GCTTS may present with bone erosion or destruction in radiography which are infrequent in FTS and giant cells are not observed in FTS under microscope [22-23]. MRI plays an important role in studying the anatomy, and avoiding nerve injury during surgery. The images of tendon and tendon sheath provide effective information for resection range and selecting the most reasonable incision. MRI also would help the clinician finding early recurrence more effectively. The treatment of FTS is surgical resection.

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