Fibroma of the tendon sheath: A diagnostic dilemma on fine-needle aspiration cytology

ABSTRACT
Fibroma of the tendon sheath (FTS) is an uncommon benign soft tissue tumor (STS) of the tendon sheath. Clinical and radiological features are not distinctive enough to clinch the diagnosis preoperatively. Although histological features are well described, diagnostic cytological features of FTS are still lacking. Till date only two reports describe the fine-needle aspiration cytology (FNAC) findings of FTS. The present case is a 50-year-old female who presented with a slow growing nodule on the right thigh over a period of 2 years. FNAC revealed low cell yield with loose clusters of fibrotic spindle cells and stellate cells intermingled with fibro-collagenous and myxoid matrix. Few cells showed mild degree of nuclear atypia. Necrosis and atypical mitoses were not seen. Cytology findings were suggestive of benign/low-grade fibroblastic or fibromyxoid lesion. Histology confirmed the diagnosis of FTS. This article discusses the diagnostic role of FNAC in FTS with its differential diagnosis.

Key words: Fibroma; fine-needle aspiration cytology (FNAC); histology; tendon sheath

Introduction
Fibroma of the tendon sheath (FTS) is a rare benign soft tissue tumor (STS), typically attached to the tendon sheath. [1-4] Although histology of FTS has been adequately described in the literature, yet diagnostic cytologic criteria have not been studied well. [1-7] To the best of our knowledge, only two studies in English describe the fine-needle aspiration cytology (FNAC) findings of FTS in three cases. [1,3] FTS may not be accurately diagnosed by FNAC, because of frequent overlapping of cytologic features with other benign or low-grade fibro myxoid STSs. [1,7] Here a case of FTS is presented with discussion on cytologic features and its differential diagnosis.

Case Report
A 50-year-old female presented with a slow growing, painless, and firm nodule on the right thigh since 2 years. She felt mild discomfort for the last 6 months. Family history and past history of the patients were unremarkable. Physical examination revealed a 3.2 cm × 3.0 cm × 2.5 cm sized, solitary firm nodular swelling, without skin involvement, on the ventral aspect of the right thigh, 7 cm above the knee joint. The swelling could be moved in transverse direction, but was fixed in a vertical direction and in the flexion state of the knee joint. Knee joint movement appeared normal. Symptoms of neurologic compression and vascular impairment were not observed.

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Nasit JG, Dhruva G. Fibroma of the tendon sheath: A diagnostic dilemma on fine-needle aspiration cytology. J Cytol 2015;32:207-9.

JITENDRA G NASIT, GAURAVI DHRUVA
Department of Pathology, Government Medical College, SSG Hospital, Vadodara, 1Department of Pathology, Pandit Deendayal Upadhyay Government Medical College and Hospital, Rajkot, Gujarat, India

Address for correspondence: Dr. Jitendra G Nasit, C/4, Suryadeep Society, Near Nutan School, Behind Chankapur Society, New Sama Road, Vadodara - 390 024, Gujarat, India. E-mail: eagleeyenasit@gmail.com
FNAC of the swelling was performed using a 22-gauge needle attached to a 10 mL disposable syringe. The two attempts of aspiration yielded low cellularity. Hematoxylin and eosin (H and E) stained smears showed few loose clusters and singly dispersed bland appearing fibrotic spindle cells and stellate cells admixed with hyalinized fibro-collagenous matrix. Spindle cells had oval to elongate nuclei, fine nuclear chromatin, and variable amount of ill-defined cytoplasm. Few cells showed mild nuclear pleomorphism. The scanty myxoid substance was admixed with scattered fibrotic spindle cells. Necrosis and atypical mitoses were not seen [Figure 1]. In correlation with clinical findings, cytological features were suggestive of a benign/low-grade fibroblastic or fibromyxoid lesion (without further specification).

The patient underwent excision biopsy of the mass with free margins. A well-circumscribed, firm, glistening white nodular mass was received measuring 3.0 cm × 2.7 cm × 2.0 cm. Cut surface showed solid homogenous, grayish-white, and minimal whorled appearance. Histologically, the tumor showed variable cellularity. Central area was composed of intersecting bundles and haphazardly arranged spindle-shaped fibroblasts and stellate-shaped cells in a dense eosinophilic hyalinized fibro-collagenous stroma. Peripheral area was less cellular with few cleft/slit-like vascular channels in a loose fibro-collagenous and myxoid matrix. Spindle-shaped fibroblasts showed elongate nuclei with smooth contour, fine nuclear chromatin, occasional distinct small nucleoli and amphophilic cytoplasm. Few cells showed mild nuclear pleomorphism. Necrosis and atypical mitoses were not observed [Figure 2]. Histopathological diagnosis of an FTS was made.

The postoperative course was uneventful. At 1-year follow-up, the patient had no signs of recurrence of the disease.

Discussion

FTS is an uncommon benign STS, arising from the tendon sheath.[1-4] FTS commonly presents as a solitary firm, slow growing, and painless mass of long duration, ranging in size from 0.5 cm to 5.5 cm.[1,2,4] Common sites are the finger, hand, and wrist.[1-4] FTS can also occur in feet, elbow, and knee. FTS rarely originate from the synovial membrane of the joint capsule and present as an intra-articular mass with movement restriction.[1,2,4] Multiple lesions are very rare. [2] Although FTS can occur at any age, its peak incidence is between 20 years and 50 years with male predominance.[2-4] Most patients are asymptomatic.[2] However, approximately one-third of the patients present with discomfort and mild pain due to compression of underlying nerves.[2] Vascular compression is uncommon.[1-4]

Magnetic resonance imaging (MRI) is a useful imaging technique prior to surgery but a definitive diagnosis of FTS cannot be made.[1,4] FNAC is an investigation of choice in many SSTs, considering its ability to differentiate between benign and malignant STTs in most cases and subsequent impact on management.[7,8] Some reactive and benign lesions (such as nodular fasciitis, schwannoma, fibrous, and myxoid tumors) may contain atypical cells. Differentiation of such reactive/benign tumor from low-grade STTs is a challenging issue solely on the basis of cytology.[7,8] In such instances, an intermediate diagnosis — benign/low-grade spindle cell tumor — is usually rendered like in the present case.[8] Here FTS, a benign STT, mimics low-grade STTs on cytology. Cytological features of the three previously reported cases of FTS including present case are as follows:

1. A hypocellular smear;
2. Bland fibroblast-like spindle cells having oval to elongate nuclei and variable amount of ill-defined cytoplasm;
3. Few clumps of hyalinized fibro-collagenous stroma; and
4. A rare myxoid substance.[1,3]
FTS usually yield low cellularity, which may be one of the limiting factors for achieving a correct diagnosis. Thin vascular channels, represented as elongated slit-like/cleft-like spaces on histology, are not seen on cytology smears of all cases including present case.\[1,3\] Myxoid change can be seen in a variety of STTs and it is not a diagnostic feature for any STTs.\[3\] Some FTSs may display mild degree of nuclear atypia; however, necrosis and atypical mitoses are typically absent.\[1,3,6\] In the present case, cytological features of FTS overlap with those of schwannoma, benign fibrous histiocytoma, fibromatosi, desmoid fibromatosis, intramuscular myxoma, nodular fasciitis, low-grade fibromyxoid sarcoma (LGFM S), and myxofibrosarcoma.\[1,4,6-8\] It is important to differentiate FTS from LGFMS and myxofibrosarcoma because of different prognosis and management. LGFMS usually show hypercellular cohesive tissue fragments of spindle cells and hypocellular zone of myxoid matrix with few dispersed single cells. Though mild nuclear atypia is common, necrosis and atypical mitoses are typically not seen. Thin-walled capillary-type channels are rare to absent. Myxofibrosarcoma show two types of malignant cells: An elongated, spindle-shaped, fibroblast-like cell and a larger, histiocyte-like cell. Large multinucleate cells can be seen. Moderate nuclear pleomorphism is common. Atypical mitoses are seen but necrosis is rare. Fragments of curvilinear capillary vessels in an abundant myxoid matrix are seen in the background.\[1,4,6-8\] In difficult cases, histological examination of an excision biopsy is essential for a specific diagnosis.\[7,8\] Immunohistochemistry is usually not required for the confirmation of the diagnosis.\[3,4\]

Clinical excision of FTS with preservation of important anatomical structures gives an extremely low recurrence rate and excellent outcomes.\[1,3\] Incomplete excision of the lesion may lead to recurrence in approximately 24% of the cases within months to years after the diagnosis was made, sometimes repeatedly, but nondestructively.\[2,4\] FTS does not carry any risk of malignant transformation.\[3,4\]

**Conclusion**

Cytopathologists should be aware of this uncommon benign clinicopathological entity. FTS can show mildly atypical spindle cells with fibro-collagenous and myxoid material, which may create a diagnostic challenge on cytology particularly in separating benign from low-grade STTs. The role of FNAC should be limited to differentiate benign from malignant STTs including low-grade STTs, due to different prognosis and management. In difficult cases, the final diagnosis must rest on the histopathological examination.

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.

**References**

1. Kumar S, Kundu ZS, Kalra R, Arora B, Kundu P, Kamboj P. Fibroma of the palmar flexor sheath: Correlation of cytological and histopathological morphology with clinical presentation. J Hand Surg 2008;2:1.
2. Park SY , Jin SP, Yeom B, Kim SW, Cho SY , Lee JH. Multiple fibromas of tendon sheath: Unusual presentation. Ann Dermatol 2011;23(Suppl 1) :S45-7.
3. Heckert R, Bear J, Summers T, Frew M, Gwinn D, McKay P. Fibroma of the tendon sheath — A rare hand tumor. Pol Przegl Chir 2012;84:651-6.
4. Ciatti R, Mariani PP. Fibroma of tendon sheath located within the ankle joint capsule. J Orthop Traumatol 2009;10:147-50.
5. Pulitzer DR, Martin PC, Reed RJ. Fibroma of tendon sheath. A clinicopathologic study of 32 cases. Am J Surg Pathol 1989;13472-9.
6. Griesser MJ, Wakely PE, Mayerson J. Intraarticular fibroma of tendon sheath. Indian J Orthop 2011;45:276-9.
7. Iyer VK. Cytology of soft tissue tumors: Benign soft tissue tumors including reactive, nonneoplastic lesions. J Cytol 2008;25:81-6.
8. Hassan AM, Khamis NN, Hamman MM. Role of fine needle aspiration cytology in diagnosis of soft tissue tumors. J Am Sci 2011;7:188-99.