Tendon Sheath Fibroma in the Thigh

VINCENT M. MORETTI, MD; ADEDAVO O. ASHANA, BA; MICHAEL DE LA CRUZ, MD; RICHARD D. LACKMAN, MD

Abstract

Tendon sheath fibromas are rare, benign soft tissue tumors that are predominantly found in the fingers, hands, and wrists of young adult men. This article describes a tendon sheath fibroma that developed in the thigh of a 70-year-old man, the only known tendon sheath fibroma to form in this location. Similar to tendon sheath fibromas that develop elsewhere, our patient's lesion presented as a painless, slow-growing soft tissue nodule. Physical examination revealed a firm, nontender mass with no other associated signs or symptoms. Although the imaging appearance of tendon sheath fibromas varies, our patient's lesion appeared dark on T1- and bright on T2-weighted magnetic resonance imaging. It was well marginated and enhanced with contrast.

Histologically, tendon sheath fibromas are composed of dense fibrocollagenous stroma with scattered spindle-shaped fibroblasts and narrow slit-like vascular spaces. Most tendon sheath fibromas can be successfully removed by marginal excision, although 24% of lesions recur. No lesions have metastasized. Our patient's tendon sheath fibroma was removed by marginal excision, and the patient remained disease free 35 months postoperatively. Despite its rarity, tendon sheath fibroma should be included in the differential diagnosis of a thigh mass on physical examination or imaging, especially if it is painless, nontender, benign appearing, and present in men.

Figure: T1-weighted coronal magnetic resonance image revealing a well-defined homogeneously low-signal mass adjacent to the tensor fascia lata (A). Fat-suppressed T1-weighted coronal magnetic resonance image revealing heterogeneous enhancement of the lesion with contrast (B).
Tendon sheath fibromas are rare, benign soft tissue tumors characterized histologically by dense fibrocollagenous stromas with scattered spindle-shaped fibroblasts and narrow slit-like vascular spaces.\(^1\) Since their first description by Geschickter and Copeland\(^2\) in 1936, few reports have been published on these lesions. These tumors typically present as painless, slow-growing solid nodules in young adult men.\(^1\) An estimated 80% to 86% of these lesions involve the fingers, hands, or wrists.\(^1\) More than 99% of these lesions are associated with tendons or tendon sheaths.\(^1\)

Tendon sheath fibromas are rarely found in the lower extremities and have never been described in the thigh. This article describes a case of a tendon sheath fibroma that developed in the thigh of a 70-year-old man, the first known tendon sheath fibroma to form in the thigh.

**Case Report**

A 70-year-old man presented with a 3-month history of a right thigh mass. He reported no associated pain, fever, chills, night sweats, or weight loss. His medical and family histories were noncontributory.

Physical examination revealed an approximately 3×3-cm superficial, firm, nontender mass in the anterolateral aspect of the right proximal thigh. No associated edema, erythema, increased warmth, fluctuance, other cutaneous changes, associated lymphadenopathy, or palpable lymph nodes existed. Hip strength and range of motion (ROM) were normal. Neurologic and vascular examinations were unremparable.

Magnetic resonance imaging (MRI) revealed a 2.9×2.6-cm soft tissue mass superficial to the right tensor fascia lata muscle belly (Figure 1). The mass was well margined and appeared dark on T1- and bright on T2-weighted magnetic resonance imaging sequences (Figure 1). Heterogeneous lesional enhancement existed with contrast (Figure 1). No surrounding soft tissue edema existed.

Although the lesion’s clinical and imaging characteristics were nonspecific, its small size and well-circumscribed appearance suggested a benign process. The differential diagnosis included various benign fibrous lesions, such as nodular fasciitis, fibromatosis, and fibroma. However, given the lesion’s heterogeneous enhancement with contrast, malignant processes could not be ruled out. In particular, the patient’s age and the lesion’s location in the thigh suggested a malignant fibrous histiocytoma. Other malignancies, such as synovial sarcoma and fibrosarcoma, remained possibilities.

Open biopsy and excision of the mass were subsequently performed. A small wedge of tissue was obtained through an incisional biopsy and sent to pathology on saline-soaked gauze for immediate evaluation. After preliminary frozen section pathology revealed benign fibrotic tissue, the remaining mass was marginally excised and sent to pathology in whole.

The gross specimen was described as well circumscribed, nodular, white, tan, and rubbery. Histologic examination showed a hypocellular mass composed of eosinophilic collagenized stroma and spindle cells with elongated nuclei, fine chromatin, and small nucleoli (Figure 2). Scattered stellate-shaped cells also existed. Rare foci with increased cellularity existed, which blended in with less cellular areas, and attachment to tendinous tissue existed. These features were consistent with a tendon sheath fibroma.

No perioperative complications occurred. Follow-up examination and plain radiographs 35 months postoperatively revealed no evidence of recurrence.

**Discussion**

Tendon sheath fibromas are rare benign soft tissue tumors. Geschickter and Copeland\(^2\) first defined these lesions in 1936; another article was not published on these uncommon lesions until 43 years later. Chung and Enzingner\(^1\) reported 138 cases in 1979, which remains 1 of the largest series on tendon sheath fibromas and serves as the foundation for much of our clinical and pathological understanding of these tumors. Since its publication, a handful of case reports and small series have been published.

Tendon sheath fibromas typically develop in young adult men.\(^1\)\(^,\)\(^3\)\(^,\)\(^5\) Peak incidence is in the third and fourth decades, and men outnumber women by a ratio of 3:1.\(^1\) Tendon sheath fibromas most commonly present as painless, slow-growing solid nodules.\(^1\)\(^,\)\(^3\)\(^,\)\(^5\) An estimated 80% to 86% of these lesions involve the fingers, hands, or wrists.\(^1\)\(^,\)\(^5\) Rare locations include the toe, foot, ankle, leg, knee, forearm, elbow, shoulder, temporomandibular joint, chest, and back.\(^1\)\(^,\)\(^5\)\(^,\)\(^8\) To our knowledge,
this is the first report of a tendon sheath fibroma occurring in the thigh.

Few imaging studies have been reported for tendon sheath fibromas and have never been reported for thigh lesions. The few descriptions that exist are predominantly found in isolated case reports with limited details and illustrations. However, tendon sheath fibromas generally appear as well-defined soft tissue masses on MRI.\textsuperscript{6,9-16} T1-weighted MRIs tend to reveal low-signal masses that are slightly hypointense-to-isointense to muscle.\textsuperscript{6,9-16} The appearance of tendon sheath fibromas on T2-weighted MRIs is more variable. Some reports describe a heterogeneous mass with mixed areas of low and high signal, and others show homogeneous low-signal intensity.\textsuperscript{6,9-16} Enhancement after contrast varies, with some tendon sheath fibroma cases reporting no enhancement, some reporting mild to significant homogeneous enhancement, and others reporting peripheral enhancement.\textsuperscript{9-12,15,16}

Grossly, tendon sheath fibromas are smooth, dense, well-circumscribed, multinodular, uniform, pearly white masses.\textsuperscript{1,3-5,17} They range in size from 0.5 to 7.0 cm.\textsuperscript{1,4,5,14,16} Histologically, tendon sheath fibromas are composed of dense fibrocollagenous stroma with scattered spindle-shaped fibroblasts and narrow slit-like vascular spaces.\textsuperscript{1,2} Scattered stellate-shaped fibroblasts can exist in low-frequency collagen bundles and are often arranged concentrically around the vascular spaces.\textsuperscript{5,17,18} The cellularity of these lesions can vary significantly from 1 area of the tumor to another, but is typically highest at the periphery.\textsuperscript{1,4,17,18}

Although the paucity of cases of tendon sheath fibromas makes establishing a consensus on the treatment difficult, the prognosis after marginal excision of these lesions is generally good due to their slow growth and benign histologic appearance. However, the largest series on tendon sheath fibromas revealed a local recurrence rate of 24% after excision; therefore, interval postoperative follow-up is recommended. No reported tendon sheath fibroma has metastasized.

CONCLUSION

Tendon sheath fibromas are rare, benign soft tissue tumors that typically present as painless, slow-growing solid nodules in the fingers, hands, and wrists of young adult men. They infrequently develop in the lower extremities, most notably in the feet or knees. The thigh can now be added to its list of potential locations. Symptoms and imaging for these lesions are not specific; therefore, pathologic analysis is typically required for accurate diagnosis. Treatment with marginal excision is usually curative, although they can recur locally. Despite its rarity, tendon sheath fibroma should be included in the differential diagnosis of a thigh mass on physical examination or imaging, especially if it is painless, nontender, benign appearing, and present in a man.

REFERENCES


Figure 2: Histologic image at low power showing a hypocellular mass of spindle cells within abundant collagenous stroma (A). Histologic image at high power showing spindle cells with elongated nuclei, fine chromatin, small nucleoli, and abundant eosinophilic collagenous stroma (B).