

## ANGIOLEIOMYOMA IN THE SOLEUS MUSCLE

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**We present a case of angioleiomyoma, a benign angiomatous soft tissue tumor in a 52-year-old patient. We emphasize that small nodular tumors showing hypervascularity on MRI or ultrasound may be malignant and should be treated with tumor excision.**

**Key-word:** Soft tissues, neoplasms.

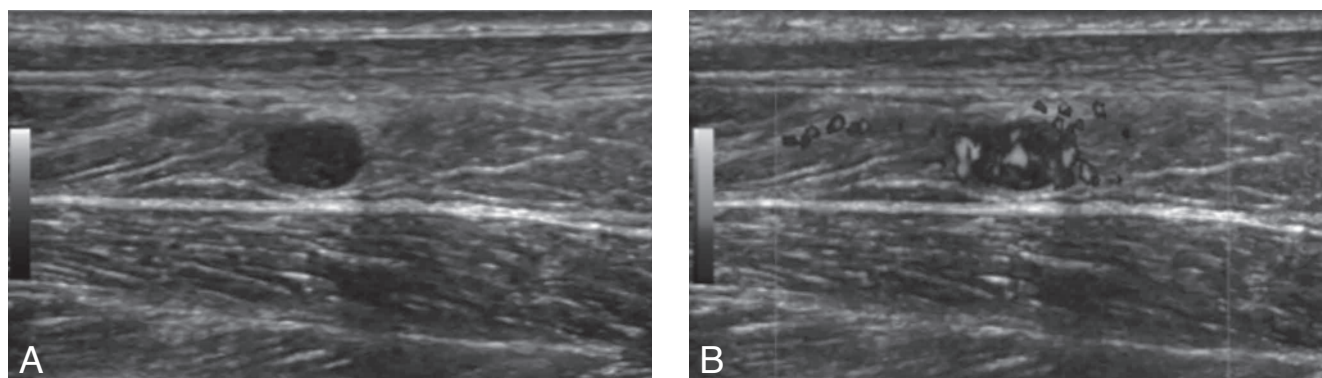
### Case report

A 52-year-old female patient presented to the orthopaedic department with intermittent right calf pain of 12 months duration. There was no clinical history of trauma. Examination showed a tender nodular swelling at the musculotendinous junction of the Achilles.

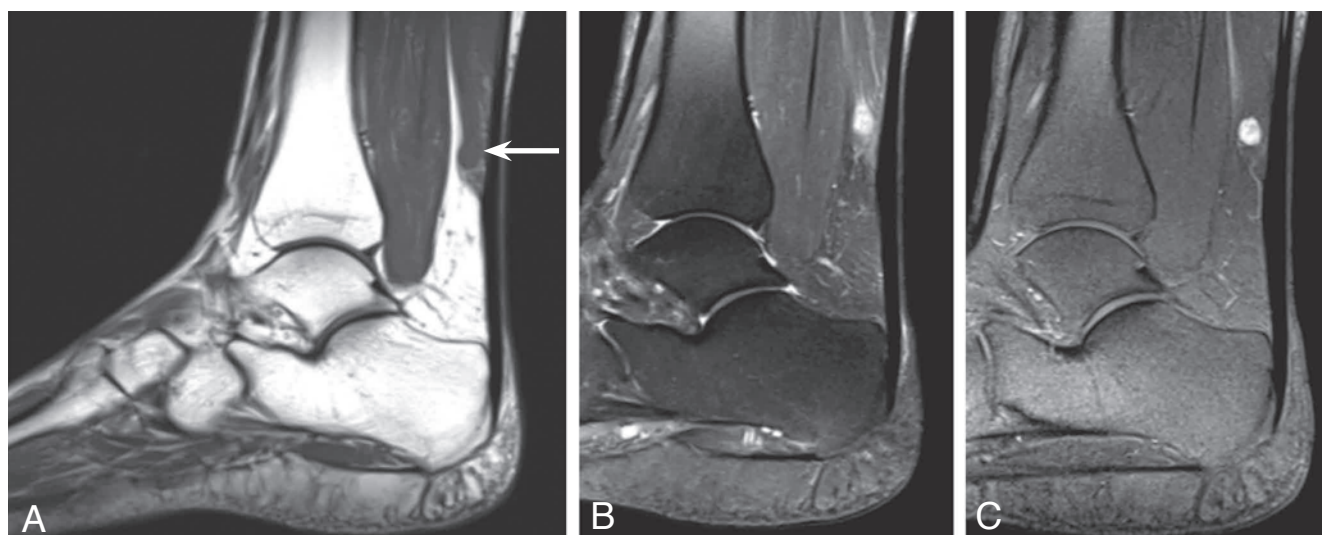
The patient was referred for sonography for the presumed diagnosis of Achilles tendinosis or tear. The examination, however, showed normal Achilles tendon and a small hypervascular lesion in the distal soleus muscle (Fig. 1). For characterization, therapy planning and local staging MR was performed. On T1-weighted sequence, signal inten-

sity of the lesion was mostly intermediate (similar to adjacent muscle) (Fig. 2A). On T2-weighted sequence, signal intensity was high (Fig. 2B). Strong enhancement was seen after intravenous contrast administration (Fig. 2C).

Amongst other soft tissue lesions (see discussion), an angioleiomyoma in the soleus muscle was suggest-



**Fig. 1.** — Sonography of the Achilles tendon and calf muscles (A) showed a heterogeneous hypoechoic lesion with sharp delimitation measuring 1 cm × 0.7 cm. The lesion is located in the distal soleus muscle. Color Doppler sonography (B) demonstrated hypervascularity of the lesion.



**Fig. 2.** — Sagittal T1-weighted MR- sequence (A) revealed a oval lesion located in the distal soleus muscle, anterior to the Achilles tendon (arrow). The lesion is homogeneous isointense to skeletal muscle. On sagittal fat-suppressed T2-weighted image (B), the lesion is heterogeneous, predominantly hyperintense to skeletal muscle, however with some internal isointense foci. Gadolinium enhanced sagittal fat-suppressed T1-weighted image (C) showed strong enhancement.

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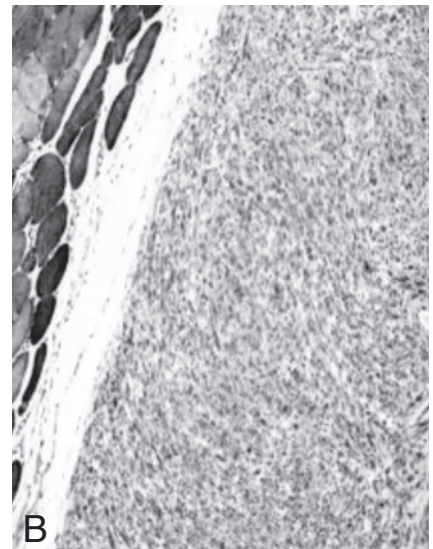
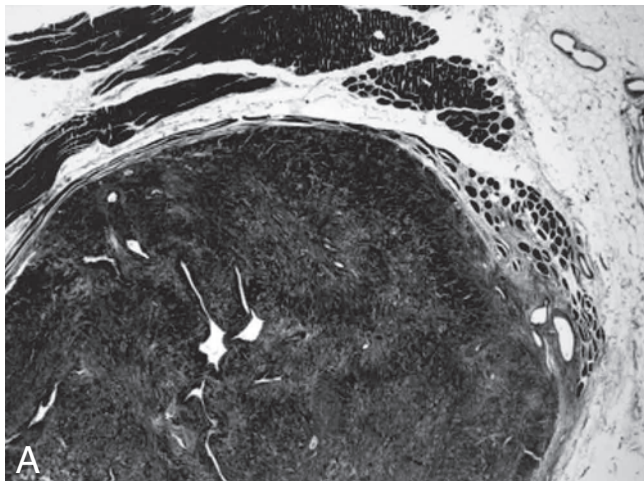


Fig. 3. — Histopathology. Low- power view (A) showed a relatively sharp delineated nodular proliferation of smooth muscle cells (arrows) surrounding multiple vascular channels (asterisk). The nodule is embedded in bundles of skeletal muscle cells (short arrow) ( $\times 50$ ). Immunohistochemical staining (B) was positive with desmine (muscle marker) ( $\times 200$ ).

ed, based on the sonographic and MR characteristics. Histopathological findings and immunohistological analysis with smooth muscle cell markers confirmed the diagnosis (Fig. 3).

### Discussion

Angioleiomyoma is a smooth muscle tumor accounting for 5% of all benign soft tissue neoplasms. The lesion originates in the tunica media of the blood vessels. It can occur anywhere in the body, however most commonly it will be discovered in an extremity, more specifically in the lower leg. The tumor can be located either superficial, as in most cases, or deep in relation to the fascia. The peak incidence is between the fourth and sixth decades of life; there is a female preponderance (1, 2). Pain is a common presenting symptom, possibly due to contraction of the smooth muscle fibers resulting in local ischemia (2). Hasegawa et al. suggested that the pain may be mediated by irritation of nerves within the lesion (3).

MR most often demonstrates a sharply delineated oval mass which is homogeneous and isointense to muscle on T1-weighted images. On T2-weighted and STIR images the lesion is mixed hyperintense and isointense to muscle. Further, the hyperintense areas on T2-weighted images typically show enhancement after intravenous contrast injection (4, 5). A radiologic-pathologic study suggested that the hyperintense areas may correspond

to blood vessels. The isointense areas are likely related to fibrous tissue and intravascular thrombi. Frequently, a hypointense peripheral rim is present on both T1- and T2-weighted images, corresponding to a fibrous capsule (5).

There are several other lesions with a rich vascular supply that should be included in the differential diagnosis. Soft tissue hemangioma is the most common soft tissue tumor. However, sonography usually shows a heterogeneous, irregular lesion and acoustic shadowing may be present due to phleboliths. On T1-weighted MR images a hemangioma is typically heterogenous with hyperintense areas corresponding to fat. Other angiomatous lesions that can present like this case include hemangioendothelioma and hemangiopericytoma. The benign form of both these tumors can strongly resemble angioleiomyoma. The more malignant forms of these vascular lesions show more aggressive features of infiltration of the surrounding tissue and by imaging these lesions are indistinguishable from angiosarcoma (6). In the lower extremity, one should also be aware of small tumors that can be hypervascular and despite their small size be malignant in nature including epithelioid sarcoma and synovial sarcoma. Both these tumors most often affect the extremities in young patients. Synovial sarcoma is located near a joint (especially the popliteal fossa). Despite its name, the tumor does not arise from synovium. Epithelioid sarcoma, an aggressive soft tissue sar-

coma, mostly occurs in the distal upper extremity, followed by the lower extremity. The tumor often shows an indolent course with high risk for recurrence and metastasis (7, 8).

MR is not able to differentiate between the different histological subtypes of angioleiomyoma, and what's more worrisome, a radiologist can mistakenly diagnose a malignant lesion as benign based only on MR features. The importance of MRI relates to its ability to distinguish soft tissue planes that allow for complete and safe surgical excision. In this patient, we were able to locate a fat plane and a muscle interface between the tumor and the Achilles and the flexor hallucis muscle respectively. Both MRI and ultrasound also enabled us to locate sural and saphenous nerves at a safe distance from the mass.

In conclusion, we reported a case of angioleiomyoma, a benign angiomatous soft tissue tumor. We emphasized that small nodular tumors that show hypervascularity on MRI or ultrasound can be malignant. Tumor excision is therefore strongly advised.

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