

Leiomyoma of The Lower Extremity: A Case Series

Sarah J. Daigle DPM¹, Danielle N. Butto DPM, AACFAS², Gabriel Gambardella DPM, AACFAS³, Rachel Balloch DPM, AACFAS²

¹ – Resident at Trinity Health New England - St. Francis Hospital and Medical Center, Hartford, CT; ² – Physician at Trinity Health New England - St. Francis Hospital and Medical Center, Hartford, CT; ³ - Physician at Bloomfield Foot Specialists, Bloomfield, CT

Statement of Purpose:

To present 4 recent patient cases in which a diagnosis of leiomyoma or angioleiomyoma was made after histopathologic examination, as well as, to review the current literature.

Literature Review:

- Leiomyoma is a benign soft tissue tumor that arises in the subcutaneous tissues or deeper in the skeletal muscle of extremities, and is postulated to originate from a smooth muscle progenitor (1).
- These tumors typically present in the uterine wall as a fibroid, and are uncommon outside of the uterus and GI tract. However, they have been found in the skin, subcutaneous tissues, and deeper structures (1, 2).
 - Represent 1.7% of all benign soft tissue tumors in the lower extremity (1).
- Angioleiomyomas are solitary, benign smooth muscle tumors that originate from the tunica media of a blood vessel, and are considered a type of leiomyoma (2-4).
 - Represent 4.4% of all benign soft tissue neoplasms, and 0.2% of all pedal tumors (2, 4).
- Leiomyomas have a non-familial predisposition, affecting women (4th to 6th decades), twice as often as men (1-3).
- Presents as a firm, palpable, mobile mass, often less than 2cm in diameter, without overlaying skin changes, which may or may not be painful (1, 3-6).
- MRI and ultrasound may be helpful in including leiomyoma in the differential diagnosis, but a true diagnosis is made with histopathologic and immunohistochemistry (7).
- Surgical resection is treatment of choice (1, 2, 4, 7).

Case Series:

Table 1 summarizes the clinical presentation of the mass, imaging, operative findings, and pathological findings, including the staining of the specimens, of the patients in this case series. Clinical and operative findings of the first patient can be seen in Figures 1 and 2. The MRI findings for patient 3 can be seen in Figures 3 and 4.

Discussion:

- There are 4 types of leiomyomas described in literature:
 - Single piloleiomyoma and multiple piloleiomyoma, which arises from the erector pili.
 - Solitary genital leiomyomas, which arise from the scrotum, penis, labia majora, vulva, and mammary areola (2, 6, 7).
 - Angioleiomyomas, or vascular leiomyomas, are a solitary, benign smooth muscle tumor that originate from the tunica media of small veins and arteries (2-4); 3 histological subtypes:
 - Solid angioleiomyoma: most common in the lower extremity; consists of smooth muscle bundles surrounding few thin vascular channels

Table 1

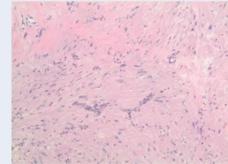
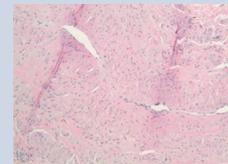
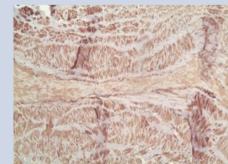
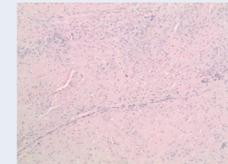
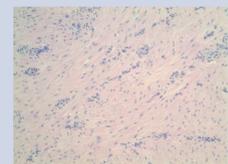
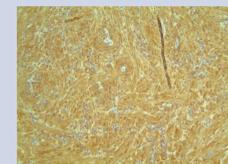
Patients	Clinical Presentation	Imaging	Operative Findings	Pathological Findings	H&E Staining	Myosin and SMA Staining
1) 45 y.o. Jamaican Female	- L medial ankle superficial to the neurovascular bundle - Present for “years” without changes in size and shape - Pain with rubbing of the mass	- X-ray: mass not appreciated - Ultrasound: - Well-demarcated oval 1.5cm x 1.3cm x 0.5cm nodule with echogenic center and hypoechoic cortex - Finding favors lymph node - MRI: - Fusiform T2 hyperintense, T1 isointense, 1.4cm x 5.4cm x 1.1cm mass - Could represent neuroma; low grade malignancy cannot be ruled out	- Mass within the subcuticular tissues - Appears to be mostly adipose tissue	- 1.3cm x 0.8cm x 0.6cm tan, rubbery nodule - Sectioning reveals a tan-white homogenous surface - Immunohistochemical stains are positive for myosin and negative for S-100 - Final Dx: Benign Leiomyoma		
2) 38 y.o. Hispanic Female	- R dorsal lateral foot - 1cm x 1cm - Pain with rubbing of the mass	- X-ray: mass not appreciated - MRI: - Solid 0.9cm x 1.0cm x 1.2cm mass dark on T1, bright on T2 with peripheral enhancement - No clear communication b/t mass and CCJ or peroneal tendon sheath	- Unorganized mass within subcuticular tissues - Lipomatous structure identified	- Measures 1.5cm x 1.0cm x 0.3cm - Portions of pale yellow adipose tissue - Immunohistochemical stains positive for smooth muscle actin (SMA) and negative for S-100 - Final Dx: Angioleiomyoma		
3) 46 y.o. Hispanic Female	- Growing mass to L anterior leg - Present for about 2 yrs - Increasing in pain	- X-ray: mass not appreciated - MRI: - Solid 1.5cm mass confined to the subcutaneous fat of the ventral mid/distal leg - No fascial or intramuscular involvement	- Circumscribed mass firmer than a normal lipoma but had features similar to a lipoma - Measured approximately 2 cm in greatest diameter	- Measures 2.0cm x 2.0cm x 1.5cm - Firm yellow-white fibrofatty tissue containing a white whorled cut surface - Composed of spindle cells w/ whorled arrangement and w/ peripheral and interspersed thin-walled blood vessels - Periphery of the lesion shows adherent adipose tissue - Immunohistochemical stains positive for desmin and SMA - Final Dx: Angioleiomyoma		
4) 30 y.o. Caucasian Male	- Developed small mass following L 5 th metatarsal osteotomy 6 months prior	- X-ray: mass not appreciated - Ultrasound: - Superficial, well defined, hypoechoic 0.6cm nodule in subcutaneous fat - No aggressive features - Possible etiologies: ganglion, adventitious bursa, or sebaceous cyst	- Firm mass within the subcutaneous tissue - Measuring less than 2cm	- Measures 1.0cm x 1.0cm x 0.3 cm - Tan-white to tan-pink, rubbery mass - Bisected to reveal a tan-white, firm, homogenous cut surface - Immunohistochemical stains are positive for SMA and negative for S-100 - Final Dx: Leiomyoma		



Figure 1



Figure 2

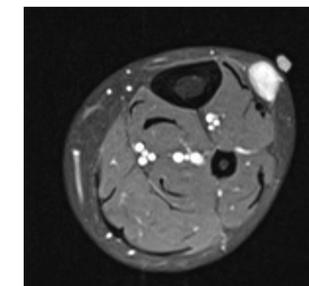


Figure 3

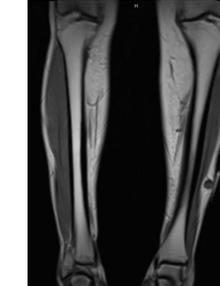


Figure 4

- ❖ Cavernous angioleiomyoma: composed of dilated vascular channels surrounded by a thin layer of smooth muscle bundles
- ❖ Venous angioleiomyoma: contain venous-like vascular channels with smooth muscle bundles that are distinguished from the vascular wall (1, 3, 8).

- Pain may or may not be associated with the lesion. When present, it may be caused by smooth muscle contraction or compression of the involved nerve or blood vessel; spasm and constriction lead to a localized hypoxia (1, 4).
- Proposed etiologies of leiomyoma: minor trauma, hamartomatous changes, venous stasis, pregnancy, and hormonal changes, especially estrogen (1, 4).
- Leiomyomas are generally a well circumscribed, homogenous mass of low to intermediate signal, isointense to muscle on T1 images. On T2 sequences, the mass appears as a uniform hyperintense lesion (1, 2, 6).
 - Gupte et al performed an MRI study of angioleiomyomas in 10 patients. No diagnoses were made with MRI. All of the tumors were diagnosed following surgical excision.
- Stock et al presented sonographic features of leiomyoma: well marginated, ellipsoid, heterogeneous and mildly hyper echoic with a thickened capsule. They concluded that a diagnosis based on sonographic features could not be made.
- Surgical excision is the treatment of choice. There are no documented recurrences. Leiomyomas are benign, and malignant transformation has been described in 1% of cases (1, 2, 4, 7).
- Definitive diagnosis is made with histopathological and immunohistochemical studies. Leiomyomas stain positive for SMA, vimentin, and desmin, and stain negative for S-100 (1, 6, 7, 9).

Conclusion:

Although this benign soft tissue tumor is rare, it is important to consider as part of a differential diagnosis, especially in women from ages 40 to 60. Leiomyomas can be successfully treated with surgical excision and have no recurrence rate. They also rarely transform into a malignancy. Confirmation of diagnosis must be achieved with histopathological and immunohistochemical studies.

References:

- Szolomayer, L., Talusan, P., Chan, W., et al. Leiomyoma of the Foot and Ankle: A Case Series. Foot and Ankle Specialist. Vol. 20, No. 10, 2016
- Maheshwari, A., Temple, H., Murocacho, C. Calcified Angiomyomas of the Foot: A Case Report. Foot and Ankle International. Vol. 29, No.4, April 2008, pp. 449-455
- Gajanthodi, S., Rai, R., Chaudhry, R. Vascular Leiomyoma of Foot. Journal of Clinical and Diagnostic Research. 2013 March, Vol. 7(3): 571-572
- Harmoui, M., Largey, A., All, M., et al. Angioleiomyoma in the Ankle Mimicking Tarsal Tunnel Syndrome: A Case Report and Review of the Literature. The Journal of Foot and Ankle Surgery. 49 (2010) 398.e9-398.e15
- Domanski, H. Cytologic Features of Angioleiomyoma: Cytologic-Histologic Study of 10 Cases. Diagnostic Cytopathology. Vol. 27, No. 3, 161-165
- Stock, H., Perino, G., Athanasian, E., et al. Leiomyoma of the Foot: Sonographic Features with Pathologic Correlation. Hospital for Special Surgery Journal. (2011) 7: 94-98
- Jalgaonkar, A., Mohan, A., Dawson-Bowling, S., et al. Deep Soft Tissue Leiomyoma Mimicking Fibromatosis in a 5-year-old Male. The Journal of Foot and Ankle Surgery. 51 (2012) 110-113
- Gupte, C., Butt, S., Tirabosco, R., et al. Angioleiomyoma: Magnetic Resonance Imaging Features in 10 Cases. Skeletal Radiology. (2008) 37: 1003-1009
- Kacerovska, D., Michal, M., Kreuzberg, B., et al. Acral Calcified Vascular Leiomyoma of the Skin: A Rare Clinicopathological Variant of Cutaneous Vascular Leiomyomas: Report of 3 Cases. Journal of the American Academy of Dermatology. Vol. 59, No. 6, December 2008, pp. 1000-1004