



Leiomyoma of the Ankle

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Leiomyomas, also known as fibroids, are benign tumors originating from smooth muscle and can arise in soft tissue, most commonly in the uterus or bladder. Those that arise in the extremities usually form subcutaneous masses. Leiomyoma of the foot has rarely been reported, and leiomyoma of the ankle is even rarer. A 52-year-old male presented with a tender nodule on the lateral aspect of his right ankle. The tumor was surgically excised and was shown to be a leiomyoma.

Key words: Foot and ankle, leiomyoma, musculoskeletal tumors

INTRODUCTION

Leiomyomas are of smooth muscle origin and are predominantly found in the uterus, affecting up to 80% of women. Few case reports in the literature describe leiomyomas of the extremities.

Leiomyomas account for 4.4% of all benign soft-tissue neoplasms.¹ They are derived from smooth muscle cells and are classified according to their origin: (a) piloleiomyomas, which arise from arrector pili muscles of the skin; (b) angioleiomyomas, which arise from vascular smooth muscle; and (c) genital leiomyomas, which arise from genital structures such as the scrotum or vulva and from the nipple or areola.²

Although noncancerous, the growth of a leiomyoma can elicit a mass effect, compressing local structures and eliciting significant pain. Symptoms may include pain, swelling, and stiffness in the affected joint. The tumor may also interfere with normal ankle movement, resulting in difficulty walking or performing other activities.

CASE REPORT

A 52-year-old male presented in September 2019 with a mass over the lateral side of his right ankle, just above the lateral malleolus. He had recognized it 5 years earlier while

wearing shoes and noted its fast growth during the previous 3 months. No sensation loss or mobilization restriction in the associated joints occurred during that period.

Physical examination revealed that the neurovascular status of the right ankle was intact, without any numbness or tingling. A rubbery, slightly mobile mass was observed and palpable within the subcutaneous tissue of the right lateral malleolus. It measured ~3 cm × 2 cm and did not illuminate. The right ankle had a full range of motion without pain or crepitus. The mass was tender on palpation and exhibited no Tinel sign. The local skin and temperature were normal.

Radiographs revealed a soft-tissue opacity inferolateral to the lateral malleolus [Figure 1], and ultrasonography revealed one lobulated hyperechoic lesion over the right ankle, ~2.2 cm × 1.1 cm × 1.6 cm in size [Figure 2], that exhibited posterior acoustic enhancement and increased vascularity on imaging. The differential diagnosis included a ruptured epidermoid cyst, hemangioma, neurogenic tumor, and sarcomas.

Surgical excision was discussed with the patient and planned. The operation was performed with a local anesthetic. The skin incision was made transversely along the tumor region. On exposure and deep to the subcutaneous layer, a solitary tumor mass was identified, and *en bloc* excision was performed [Figure 3]. Pathologic examination revealed soft tissue leiomyoma, characterized by a solid lesion composed

Received: February 28, 2023; Revised: May 03, 2023;
Accepted: May 26, 2023; Published: October 10, 2023

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How to cite this article: Hsieh CY, Chen YY, Wang CC. Leiomyoma of the ankle. J Med Sci 2024;44:47-9.



Figure 1: Preoperative anteroposterior radiograph of the right ankle showing soft-tissue opacity inferolateral to the lateral malleolus without destruction of the bony structure

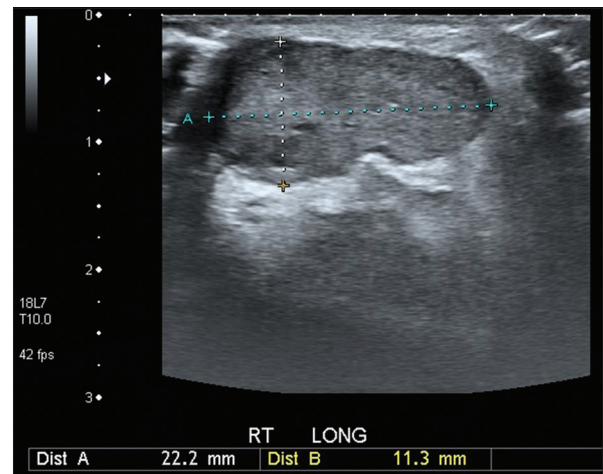


Figure 2: Ultrasonography revealed one lobulated hyperechoic lesion, ~2.2 cm × 1.1 cm × 1.6 cm in size

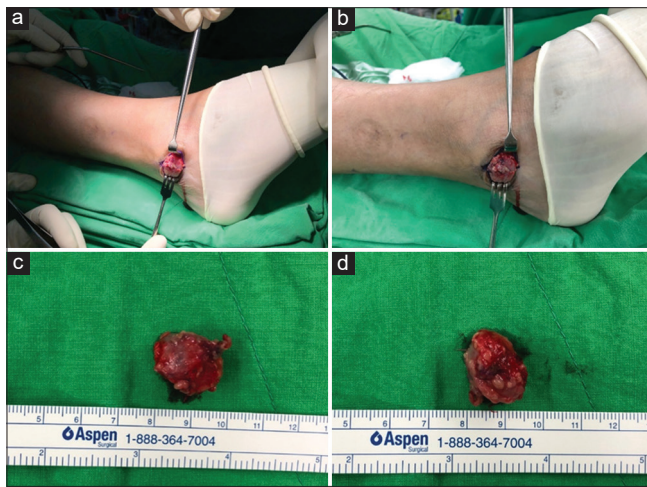


Figure 3: Intraoperative photographs. (a and b) The tumor mass was located over the inferolateral to lateral aspects of the malleolus, (c and d) the resected specimen

of degenerative smooth muscle bundles arranged in a whorled pattern [Figure 4].

DISCUSSION

Leiomyoma of the ankle is rare, and the exact cause of this type of tumor is not clear. However, leiomyomas are believed to develop from smooth muscle cells that are present in blood vessels or the muscles surrounding the ankle joint. Deep soft-tissue leiomyomas, as reported in the English language literature, have been reported in patients aged 3–62 years (mean, 25 years) and affect male patients more frequently than female patients.³

Symptoms may include pain, swelling, and stiffness in the affected joint. The tumor may also interfere with

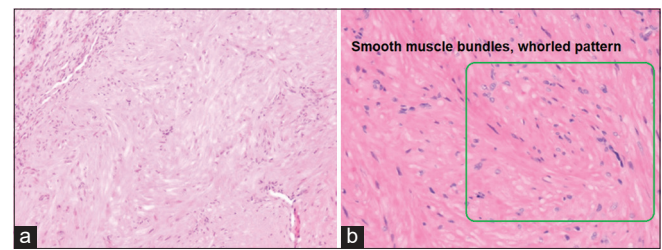


Figure 4: Pathology sections. (a) (Low power view, ×100) and (b) (High power view, ×400) show pictures of leiomyoma of the soft tissue, characterized by a solid tumor lesion composed of degenerative smooth muscle bundles arranged in a whorled pattern

normal ankle movement, resulting in difficulty walking or performing other activities. Leiomyoma of the ankle is typically diagnosed through physical examination and imaging studies, and biopsy is performed to confirm the diagnosis.

The differential diagnosis for these subcutaneous lesions in the lower extremities includes schwannoma, neurofibroma, ganglion cyst, liposarcoma, and myxomatous tumors. Operative excision is the standard of care to establish a diagnosis and rule out malignancy.

Deep soft-tissue leiomyomas characteristically exhibit well-defined circumscription with a fibrous pseudocapsule and myxohyaline stromal degeneration. On microscopic examination, intersecting bundles of spindle cells with generally uniform, round-ended, elongated nuclei, and intensive eosinophilic cytoplasm are evident.⁴

In general, leiomyomas of the ankle have a good prognosis. Benign leiomyomas rarely transform into malignant leiomyosarcomas; De Vos *et al.* reported that malignant transformation occurred in 0.13%–0.29% of cases.⁵ Transformation of uterine leiomyoma into leiomyosarcoma has been reported; Leibsohn *et al.*

reported that of 1429 patients who underwent hysterectomies for benign leiomyoma, only 7 (0.5%) were found to have leiomyosarcoma.⁶ No cases of leiomyosarcoma in the foot or ankle have been reported; however, the long-term outlook depends on various factors, such as the size and location of the tumor, the age and overall health of the patient, and the extent of surgical intervention required.

CONCLUSION

Despite the overall low incidence of heel tumors, leiomyoma should be considered in the differential diagnosis for ankle masses when no mechanical cause is evident. As demonstrated in our patient, leiomyoma has a positive prognosis. Surgical excision can be curative for solitary lesions and provides complete symptom relief.

Ethical approval

This study proposal was approved by the Institutional Review Board of Tri-Service General Hospital (C202215155) (December 30, 2022~December 29, 2023).

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent form. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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