DOI: 10.7860/JCDR/2024/68296.19007

Case Report

Oncology Section

An Uncommon Site of Cutaneous Leiomyoma on the Heel of the Foot

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ABSTRACT

Leiomyomas are common benign tumours of smooth muscles, often occurring in the uterine muscle wall. These growths usually appear during a woman's reproductive years and are not malignant. Leiomyomas are quite common and impact a large percentage of women worldwide. Occasionally, leiomyomas can be located in the extremities and cause pain due to compression effects. Typically, foot leiomyomas appear as a lump or mass in the soft tissue of the foot that grows slowly. They are normally painless, but pain or discomfort occurs when the growth affects or compresses the surrounding tissues or nerves. Although the precise cause of leiomyomas is unknown, it is thought that hormone changes, genetics, and other unidentified factors play a role in their incidence. Cutaneous leiomyomas are most often benign, and surgical removal can benefit patients in terms of pain management or symptom relief. Leiomyomas of the foot are uncommon. The present case report illustrates the clinical, radiographic, and pathological findings of a rare subcutaneous leiomyoma in the foot. The authors present the case of a 50-year-old woman who visited the Outpatient Department (OPD) complaining of swelling over the back of her left heel. Magnetic Resonance Imaging (MRI) of the ankle depicted the characteristics of the swelling, which was confirmed as leiomyoma through Immunohistochemical (IHC) tumour markers {Haematoxylin and Eosin (H&E)}. The lesion was surgically excised, and histopathology of the excised sample revealed leiomyoma.

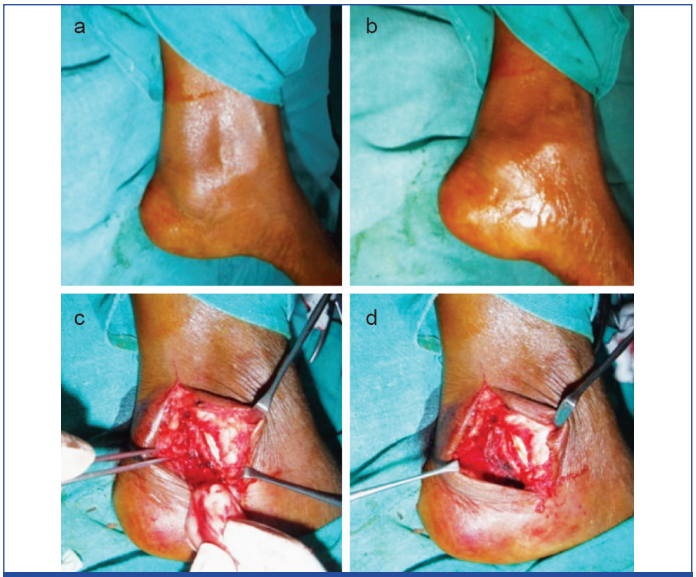
Keywords: Benign tumours, Medial malleolus, Soft-tissue tumour

CASE REPORT

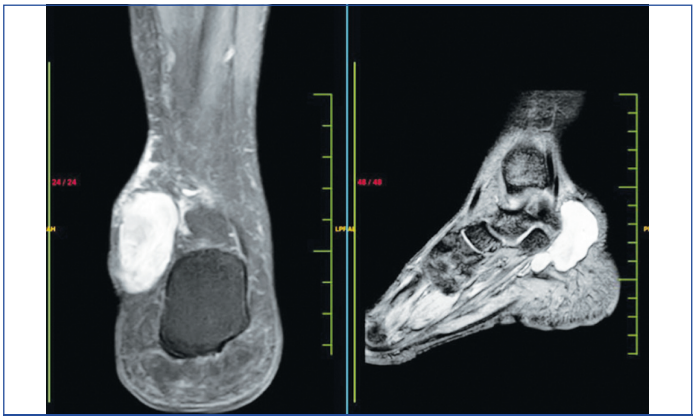
A 50-year-old woman presented with a primary complaint of swelling on the medial aspect of her left foot that had been ongoing for six months. The patient had no significant medical history or co-morbidities. The swelling started slowly and progressively worsened over time. The pain also increased gradually, particularly while walking and wearing footwear. During the physical examination, a single firm lump measuring approximately 4×3.5×2 cm was found below the medial malleolus of the left foot. The lump was located in the subcutaneous plane, non tender, barely movable, and had a firm to hard consistency [Table/Fig-1a-d]. All the digits had full range of motion without experiencing pain.

Based on the initial assessment, the patient was diagnosed with a ganglion cyst. An attempt was made to collect fluid from the swelling through aspiration, but it was unsuccessful. Subsequently, an MRI scan was performed, which revealed an intensely enhancing altered signal intensity lesion with a few cystic areas within the intramuscular plane on the medial aspect of the ankle joint. The lesion appeared iso- to hypointense on T1WI and heterogeneously hyperintense on T2WI/SPAIR. A tiny focus of blooming was observed on Glycopeptide Resistant Enterococci (GRE) [Table/Fig-2]. The size of the lesion was approximately 4.2×2.2×4.3 cm. Superiorly, it extended up to the body of the talus, laterally it abutted the flexor hallucis longus tendon, and medially it reached the subcutaneous plane. The possibility of a peripheral nerve sheath tumour was considered.

The patient underwent excisional biopsy of the lesion, and a single whitish-brown tumour was removed for histopathological analysis [Table/Fig-3]. The analysis revealed that the outer smooth muscle layer was whirled away from the vessels and blended with the peripheral smooth muscle fibres, which suggested a benign mesenchymal tumour with mild nuclear atypia [Table/Fig-4]. To arrive at a definitive diagnosis, immunohistochemistry markers such as Smooth Muscle Actin (SMA) and S-100 were performed. The tissue was positive for Alpha-SMA and Vimentin, and negative

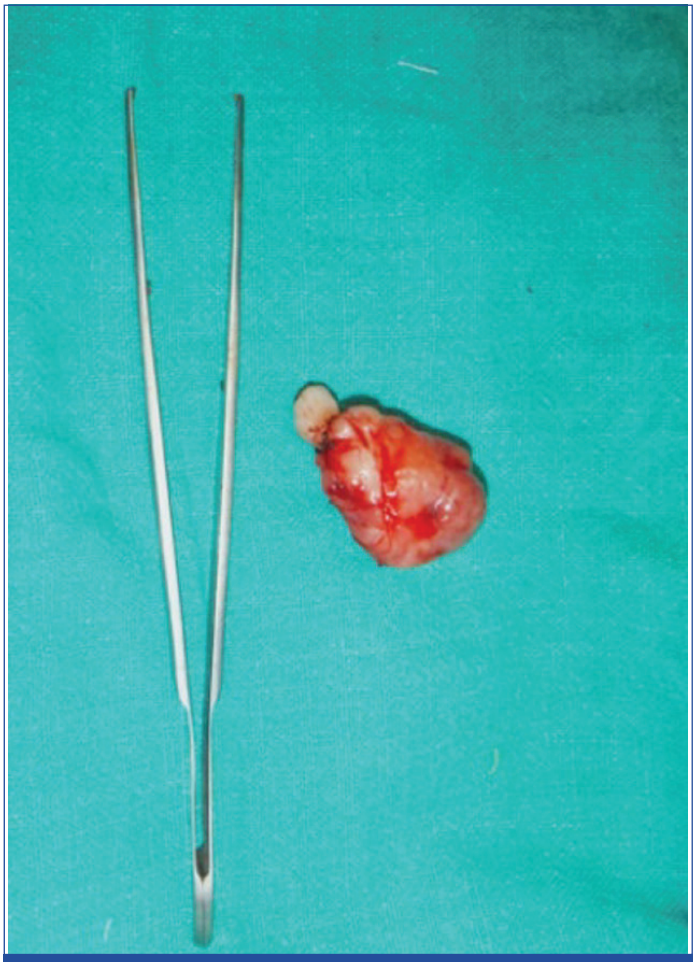


[Table/Fig-1]: Preoperative and intraoperative images depicting stages of excision of swelling.

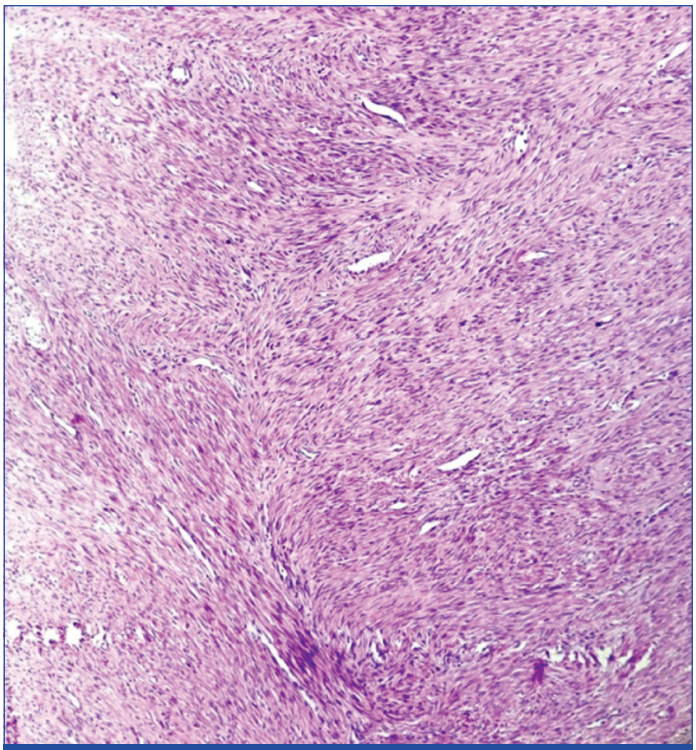


[Table/Fig-2]: MRI scan of the heel, showing intensely enhancing signal intensity lesion on medial aspect of ankle joint.

for S-100 and CD34. The negative stains for SMA confirmed the diagnosis of leiomyoma, as it is a smooth muscle tumour [Table/Fig-4].



[Table/Fig-3]: Excised leiomyoma from the foot heel of the patient.



[Table/Fig-4]: Histopathologic image of the excised sample depicting classical features suggestive of leiomyoma (H&E, 10x).

The findings from the histopathology and immunohistochemistry of the sample were suggestive of leiomyoma. The patient had an uneventful recovery period and the sutures were removed on postoperative day 10.

DISCUSSION

Cutaneous leiomyomas are rare smooth muscle tumours that can be inherited. The most common sites for leiomyomas are the uterus and gastrointestinal tract, followed by the skin [1]. Occasionally, leiomyomas can also affect the soft tissues of the extremities, with the lower extremity being more frequently affected than the upper. The prevalence of leiomyomas has not been clearly reported. Uterine leiomyomas are the most common, followed by skin leiomyomas. Based on their site of origin, leiomyomas are classified into three types: genital leiomyomas, angioleiomyomas, and piloleiomyomas [2,3]. Each type of tumour has unique clinical and histological characteristics. A case series identified an association between germline mutations in the fumarate hydratase gene and the occurrence of leiomyomas, although the mechanism of tumour predisposition remains unknown. Skin leiomyomas were commonly observed in parents of fumarate hydratase-deficient children [4]. Leiomyomas can also be classified based on their location as superficial or cutaneous leiomyomas, which typically arise from the arrector pili muscle; subcutaneous leiomyomas, which usually arise from dermal vascular smooth muscle; and deep leiomyomas, which are extremely rare in the extremities [5].

Biopsy is performed in solitary lesions to consider a broader list of differential diagnosis they may indicate. Clinical differential Diagnosis may include angiolipoma, eccrine spiradenoma, neurofibroma, nevus, glomus tumour, and lipoma. In more than half of cases, cutaneous leiomyomas present as a small, isolated lesions (around 2 cm) that are painful or tender. Surgical excision with or without skin grafting is the preferred treatment for painful solitary lesions or multiple cutaneous leiomyomas if there are only a few lesions. However, recurrence occurs in 50% of cases with multiple lesions. For individuals with painful and numerous lesions affecting large areas of the body, a various pharmacological therapy techniques have been utilised [6].

Cutaneous leiomyomas raise the possibility of an underlying aetiology of Reed's syndrome, also known as Hereditary Leiomyomatosis and Renal Cell Carcinoma (HLRCC). HLRCC is caused by an autosomal-dominant inactivating mutation of the tumour suppressor fumarate hydratase, which is associated with chromosome 1q42.3-q43. Piloleiomyomas, especially when numerous, have the strongest association with HLRCC [6,7].

A wide range of soft tissue tumours can affect the foot, although only 5% of malignant soft tissue tumours and 8% of benign soft tissue tumours are estimated to occur in the foot or ankle. The heel is an uncommon site for tumour involvement, and different parts of the foot tend to develop different types of tumours. The most common malignant neoplasms near the heel include clear-cell sarcoma, Kaposi's sarcoma, and malignant fibrous histiocytoma [8]. Giant-cell tumours, lipomas, and leiomyomas are the three most common benign neoplasms of the heel. This presents a diagnostic challenge, and if not properly diagnosed, it can lead to adverse outcomes such as multiple excisions, the need for amputation, recurrence, and others [9].

In the present case, even though leiomyoma was observed in various regions of the foot, its unique presentation was downward and lateral to the medial malleolus. Initially, the swelling mimicked the features of a ganglion. Unlike other cases, our patient presented with a painless swelling that gradually progressed to cause pain when wearing tight footwear [10,11].

Cutaneous leiomyomas can be extremely painful and can significantly impact the quality of life. Pharmacological options such as Gabapentin, Nifedipine, oral Nitroglycerin, and Alpha-1 adrenoceptor antagonist Doxazosin are used for pain relief when surgical management is not feasible or in patients with multiple lesions. Electrocoagulation and cryotherapy have been experimented

with, but only CO_2 laser ablation therapy has shown satisfactory results [12-14].

CONCLUSION(S)

Histopathologic examination is essential to confirm the diagnosis of other painful papulonodules, such as nodular fasciitis, fibromyoma, and smooth muscle hamartoma. Despite the generally low occurrence of ankle tumours, a differential diagnosis should be conducted for leiomyomas in cases presenting with unexplained heel discomfort. A confirmed diagnosis of leiomyoma offers a favourable prognosis, as observed in the present case. Surgical removal can be curative and provide complete relief of symptoms for solitary lesions.

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PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Oct 27, 2023
- Manual Googling: Dec 09, 2023
- iThenticate Software: Dec 12, 2023 (4%)

ETYMOLOGY: Author Origin

EMENDATIONS: 6

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Oct 26, 2023**
Date of Peer Review: **Nov 15, 2023**
Date of Acceptance: **Dec 14, 2023**
Date of Publishing: **Feb 01, 2024**