

# Lipoma on the Sole of the Left Foot: Case Report

Emile Kouakou Tano<sup>1</sup>, Priscilla Felicia Tano<sup>1</sup>, Fiifi-Yankson Papa Kwesi Sonsomir<sup>1</sup>, Alexis Buunaaim<sup>2</sup>, Emmanuel J K Adu<sup>3</sup>, Paa Kwasi Baidoo<sup>4</sup>

## Learning Point of the Article:

The rare nature of lipoma on the sole of the foot requires a comprehensive evaluation to avoid any misdiagnosis and mismanagement.

## Abstract

**Introduction:** Lipomas are benign soft-tissue swelling commonly found on the neck, upper back, trunk, and shoulder but are rare in the foot and particularly in the sole.

**Case Report:** This is a case of lipoma in a 49-year-old female teacher with 2 months history of painless swelling at the sole of the left foot which later became painful when it was traumatized. The patient was referred from a peripheral hospital to a teaching hospital in Ghana. Ultrasonography assessment revealed a hematoma, so our surgical team decided to do an excision biopsy under a popliteal block. Intraoperative findings revealed a lipoma and the mass was sent for histopathological assessment. The excised mass microscopically showed lobules of mature fat cells with areas of fibrous septae which have blood vessels and some nerves. The histopathological report revealed a diagnosis of fibro lipoma with no signs of malignancy. The surgery was uneventful and a 6-month follow-up period showed a healed wound and the patient can fully step on her left foot.

**Conclusion:** The rare nature of a lipoma found at the plantar surface of the foot makes this case interesting and the creation of awareness can help heighten the index of skepticism among clinicians especially when patients present with a swelling on the sole which has been traumatized. The Doppler ultrasound findings were different from our surgical findings; therefore, lipoma should be a differential diagnosis of swelling on the sole of the feet associated with trauma.

**Keywords:** Lipoma, benign tumor, popliteal block, histopathology, case report.

## Introduction

Lipoma defined as a ubiquitous swelling is a usual soft-tissue swelling and represents about 50% of all soft-tissue swelling [1]. One-fourth of soft-tissue swelling is generally malignant [2]. Lipoma is rarely found in the sole. This is because it comprises mature fat cells that are typically discovered in regions where there is rich adipose tissue [2, 3].

Per our literature search, such a case has not been reported in Ghana and the sub-region even though lipoma occurring in other parts of the body have been reported [4]. The rare nature of a lipoma found at the plantar surface of the foot makes this case fascinating and the creation of awareness can help heighten the index of suspicion among clinicians.

Access this article online

Website:  
www.jocr.co.in

DOI:  
<https://doi.org/10.13107/jocr.2022.v12.i11.3398>

## Author's Photo Gallery



Dr. Emile Kouakou Tano



Mrs. Priscilla Felicia Tano



Dr. Fiifi-Yankson Papa Kwesi Sonsomir



Dr. Alexis Buunaaim



Dr. Emmanuel J K Adu



Dr. Paa Kwasi Baidoo

<sup>1</sup>Department of Surgery, Komfo Anokye Teaching Hospital, Kumasi, Ghana,

<sup>2</sup>Department of Surgery, School of Medicine, University for Development Studies, Tamale, Ghana,

<sup>3</sup>Department of Surgery, School of Medicine and Dentistry, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana,

<sup>4</sup>Department of Orthopedics and Trauma, Komfo Anokye Teaching Hospital, Kumasi, Ghana.

### Address of Correspondence:

Dr. Emile Kouakou Tano,  
Department of Surgery, Komfo Anokye Teaching Hospital, Kumasi, Ghana.  
E-mail: kanot2001@yahoo.com

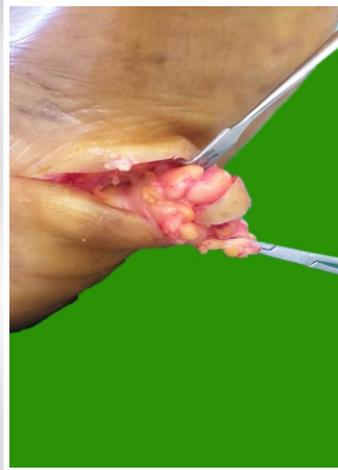
Submitted: 10/08/2022; Review: 18/09/2022; Accepted: October 2022; Published: November 2022

DOI: <https://doi.org/10.13107/jocr.2022.v12.i11.3398>

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**Figure 1:** Swelling over the sole of the left foot.



**Figure 2:** Excision biopsy.

### Case Presentation

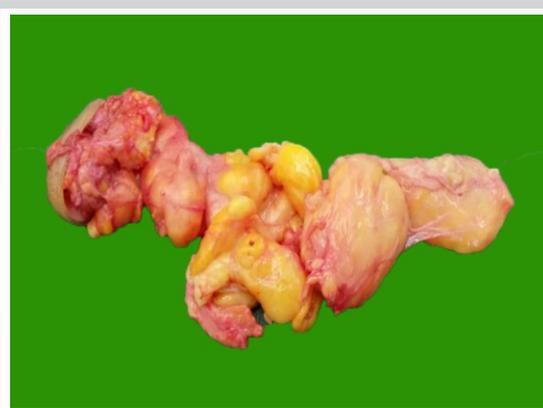
A 49-year-old female teacher with no history of chronic illness referred on account of painless swelling on the sole of the left foot of 2-month duration. The swelling had gradually increased in size over the period. She had no history of trauma to the left foot before the development of the swelling.

Before the presentation, a Doppler ultrasound done revealed fluid collection in the subcutaneous tissue of the plantar of the left foot with mixed echogenicity measuring about  $2.6 \times 2.5 \times 1.8$  cm (Vol. 6.0 mL). The surrounding soft tissue demonstrated areas of inflammatory changes. Hence, an impression of the abscess was reported with a queried diagnosis of hematoma. X-ray of the left foot was unremarkable.

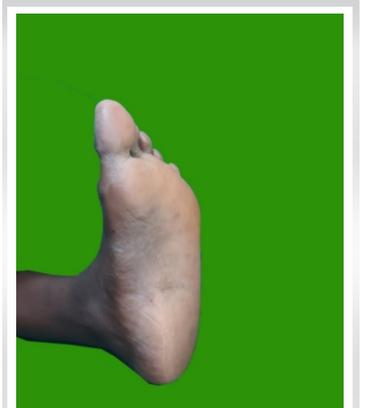
On examination, there was a 5 cm  $\times$  3 cm swelling at the medial arch of the left foot. The mass was soft, tender, not mobile, and attached to the overlying skin. The slip sign was not elicited. The overlying skin was hyperkeratotic (Fig. 1). There were no palpable inguinal lymph nodes.

Based on history, physical examination, and investigations, the patient was prepared for an excision biopsy.

A popliteal block was given, and a tourniquet was applied. Under aseptic conditions, an s-shaped transverse incision was made over the swelling and deepened to the capsule of the mass. There was a fatty-looking mass extending from the medial arch of the foot to the base of the second toe. The mass was excised and hemostasis was secured and the incision was closed in layers with vicryl 2.0 to subcutaneous tissue and prolene 2.0 to skin and a dressing was applied.



**Figure 3:** Fatty mass excised or lipoma.



**Figure 4:** Healed sole of the foot.

The post-operative period was unremarkable. The stitches were removed post-operative day 14. The histopathological report revealed microscopically an area showing lobules of mature fat cells with areas of fibrous septae which have blood vessels and some nerves. A definite diagnosis of fibro lipoma with no malignancy was made.

The patient was reviewed at the outpatient clinic. A 6-month follow-up period showed a healed wound and the patient can fully step on her left foot.

### Discussion

Lipomas are benign swelling, representing about 50% of all soft-tissue swelling [1, 5]. These swellings are uncommon on the foot, representing about 4% of benign tumors. Lipoma usually occurs where fatty tissues are found. They are benign and mesenchymal neoplasms [11]. These swellings usually affect the shoulder, upper back, trunk, and neck [8] which disagrees with our case report whereby the lipoma was on the sole. Ozdemir et al. as cited by Dholakia et al. examined case series of 196-foot tumors and described the most common of them was ganglion after which plantar fibromatosis followed; lipoma accounted for (2%) with just four cases [6, 11] Lipomas usually occur in the 4th–7th decades of life and this patient fits into the age category for lipomas [11, 12]. Furthermore, lipomas are often found in patients who are obese [5, 13] which disagrees with our findings since our patient was in the overweight category with a body mass index of 25.7. The etiology of lipoma remains uncertain [8, 14] like in our case report; however, a many risk factors may include genetic aberrations, obesity, hypercholesterolemia, and trauma [1,10]. Post-traumatic lipoma can result from herniation of fatty tissue after trauma. This is a pseudo lipoma as it is not a real tumor of the adipose tissue [1]. Inflammatory cytokines and mediators released by traumatized and dead cells can lead to the differentiation of pre-adipocytes to mature adipocytes resulting in the formation of lipoma [1].

A study by Khadilkar et al. differentiated lipomas from pseudo-lipomas through the existence of a fibrous capsule [9]. The swelling in this present case was able to be identified as a lipoma through the existence of a thin fibrous capsule with a progressive enlargement in size.

Dholakia and colleagues reported of the five regions in the foot and ankle, namely, the ankle, heel, dorsum of the foot, plantar surface of the foot, and toes for showing the site of the tumor [11] which is consistent with our findings where the lipoma extended from the medial arch of the foot to the base of the second toe.

Although clinically a convincing diagnosis is made, tumors with uncharacteristic clinical features might require radiological examination such as ultrasound, computerized tomography (CT) scan, or magnetic resonance imaging (MRI) which is standard for investigating soft-tissue tumors [3, 8]. Septa below 2 mm on CT and MRI imaging are suggestive features of lipoma [11]; however, these investigations are not routinely done in our subregion mainly due to cost and availability. Ultrasound is mostly the preferred imaging technique which is why it was requested for this patient the case report.

Lipoma of the foot must be distinguished from other lipomata lesions like fat herniation. Lipomas are different from herniation of adipose tissue as the latter will not increase in size or be engaged by fibrous capsules. Liposarcoma, Kaposi sarcoma, or synovial sarcoma are malignant soft tissue sarcoma of the foot that is to be differentiated from lipoma [15].

Excision biopsy is the current treatment that gives a definite diagnosis as was done in this case report [3].

### Conclusion

Soft-tissue swelling of the lower extremity especially of the foot is uncommon with an asymptomatic presentation. Findings of Doppler ultrasound suggested a diagnosis of hematoma, this diagnosis was found to be a lipoma during the excision biopsy which was later confirmed by histopathological examination of the excised mass. Therefore, lipoma should be a differential diagnosis of a swelling on the sole of the feet associated with

trauma as in the case presented. This case is of significance because the ultrasound diagnosis was a hematoma which was false and led to mismanagement of the patient until the correct diagnosis was made intraoperatively. Furthermore, a lipoma is mostly painless but became painful on trauma to the surrounding tissues; hence, it became a case of scientific importance.

With the correct diagnosis and treatment made, the patient was able to return to full activity after 6 months of treatment and follow-up and she was grateful to our team.

### Clinical Message

Soft tissue swelling of the lower extremity especially on the sole foot is uncommon with an asymptomatic presentation like this case. However, a detailed clinical evaluation will always help the clinician have a high index of suspicion for a rather rare location of a common condition like this case despite a contrary sonographic finding. Therefore, a lipoma should be a differential diagnosis of a swelling on the sole of the feet associated with trauma as in the case presented.

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

**Conflict of interest:** Nil    **Source of support:** None

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**Conflict of Interest:** Nil  
**Source of Support:** Nil

**Consent:** The authors confirm that informed consent was obtained from the patient for publication of this case report

## How to Cite this Article

Tano EK, Tano PF, Sonsomir FPK, Buunaaim A, Adu EJK, Baidoo PK. Lipoma on the Sole of the Left Foot: Case Report. *Journal of Orthopaedic Case Reports* 2022 November;12(11):19-22.

