Case Report *Open Access*

Journal of Innovative Clinical Trials and Case Reports

ISSN: 3068 - 1936

DOI: *doi.org/10.63721/25JCTC0111*

Intraosseous Lipoma of the Calcaneum in a 20-Year-Old Male Managed by Curettage and Bone Grafting - A Case Report

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Citation: Pranav Kothiyal, Puneet Gupta, Pritish Gautam (2025) Intraosseous Lipoma of the Calcaneum in a 20-Year-Old Male Managed by Curettage and Bone Grafting - A Case Report. J of Inn Clin Trail Case Reports 1(2): 1-7. WMJ/JICTCR-111

Abstract

Intraosseous lipomas are rare benign tumours that are rarer still in calcaneum. Lipomas are more common in soft tissues and there occurrence in bones is detected incidentally most of the times. Here we report the case of a 20 year old male who was being treated for heel pain since 3 months without any relief. On radiographic evaluation a well defined lytic lesion was discovered in the right calcaneum that was managed by thorough curettage and autologous iliac crest cancellous bone grafting. The patient recovered well over a period of the next few months which was evidenced by resolution of symptoms and good incorporation of graft in the lytic lesion.

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Keywords: Calcaneum, Intraosseous Lipoma, Heel Pain

Submitted: 03.07.2025 **Accepted:** 16.07.2025 **Published:** 30.07.2025

Introduction

Intraosseous lipomas are rare benign bone tumors that comprise approximately 0.02 - 0.1% of all benign bone tumors [1,2]. The calcaneum, one of the more common sites for these lesions, may present with nonspecific symptoms such as localized heel

A 20 years old male patient presented with persistent pain in the right heel, which had been ongoing for 3 months. The pain was aggravated by prolonged standing, walking, and physical activity. There was no history of trauma, fever, or systemic symptoms. On clinical examination no obvious swelling or deformity was

observed in the heel. Localized deep tenderness was noted over the posterior aspect of the calcaneum. Full range of motion was present in the ankle joint. Antalgic gait was present due to pain on heel strike. The skin over heel posterior aspect of foot was normal in texture without any swelling, sinus, dilated vessels or tethering to underlying structures. No neurovascular deficits were identified.

The patient was investigated by getting a plain radiograph of the left foot done that revealed a well-demarcated, lytic lesion within the body of the calcaneum. The lesion was radiolucent with a sclerotic rim, consistent with a benign tumor. Cockade sign was seen as small central calcifications inside the lytic cavity that indicated towards the diagnosis of a intraosseous lipoma. To accurately delineate the extent of lesion, any cortical breach and soft tissue spillage a MRI was done that confirmed a well-circumscribed intraosseous lesion, 2.4 x 2.1 cm in size. The lesion was predominantly hypointense on T1-weighted images and hyperintense on T2-weighted images with narrow transition zone. There were no aggressive features such as cortical destruction or periosteal reaction, suggesting a benign process. Based on clinical and radiological findings, a differential diagnosis of a simple bone cyst, non-ossifying fibroma or intraosseous lipoma of the calcaneum was considered.

Management

Given the findings of large circumscribed lytic lesion in the calcaneum presenting with increasing heel pain and impending pathological fracture, surgical intervention in the form of curettage of lesion followed by cancellous bone grafting was planned. The goal of surgery was to prevent further weakening of the calcaneum, and subsequent pathologic fractures. The lesion was approached by a lateral incision over the calcaneum. A cortical window was created and thorough curettage was performed to remove the intralesional tissues and any remnants of the tumor. After complete curettage, the cavity was packed with autologous cancellous bone graft harvested from the iliac crest to promote healing and restore the structural integrity of the calcaneum. The incision was closed in layers, and a sterile dressing was applied. The foot was immobilized in a below-knee cast to provide stability during the initial postoperative period. Postoperatively The patient was placed in a non-weight-bearing cast for 6 weeks. The sutures were removed after 10 days and patient was prescribed analgesics for pain control and advised to elevate the foot to reduce swelling. After 6 weeks, the cast was removed, and physiotherapy with partial weight-bearing was initiated. After 8 weeks the patient was allowed full weight bearing. The histopathological examination of the biopsy specimen revealed adipose tissue with characteristic lobulations and areas of lipocytes in opposition with medullary trabecular bone the confirmed our clinicoradiological diagnosis.

At 2 Month Follow-Up the patient reported improvement in pain, with minimal discomfort during rest. However, some pain persisted with prolonged activity. X-rays at 2 month showed early signs of graft incorporation and no evidence of recurrence. At 3-Month Follow-Up the patient was pain-free during daily activities and able to walk without discomfort. At 6-Month Follow-Up the patient returned to normal physical activity, including sports, without any pain or limitations. Gait returned to normal, and there was no tenderness over the calcaneum. Continued incorporation of the bone graft was observed, with no signs of lesion recurrence.

Discussion

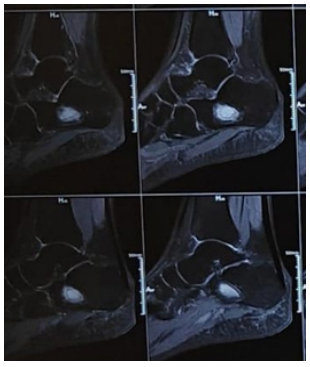
Intraosseous lipomas are benign tumors of adipose tissue found within bone. These are rare entities that have not been reported very frequently in literature but as advancements are being made in radiological investigative techniques there incidence have risen over the years [5]. They often remain asymptomatic but can cause pain when they grow larger or are located in weight-bearing bones such as the calcaneum [6-8]. Usually, the diagnosis of an intraosseous lipoma of the calcaneum is made after getting a CT scan or MRI done. MRI findings often change with the stage of tumour ranging from radiolucent lesions with a thin border to a radiodense lesion with a thick sclerotic border [9].

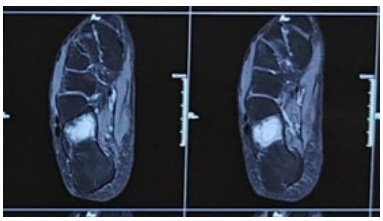
The categorisation and classification of intraosseous lipomas was given by Milgram based on the degree of involution. The Cockade sign described by milgram as pathognomic for intraosseous lipomas was seen in the X-ray of this patient presenting as a well defined lytic lesion with central calcification [8,9]. He categorised these lipomas into stage 1, 2 and 3 with stage 1

2 and 3 with stage 1 lesions are composed of mature fat cells, stage II lesions show fat cells with some necrotic foci, macrophages and calcification; and stage III lesions show necrotic fat with focal calcifications and cystic degeneration [9].

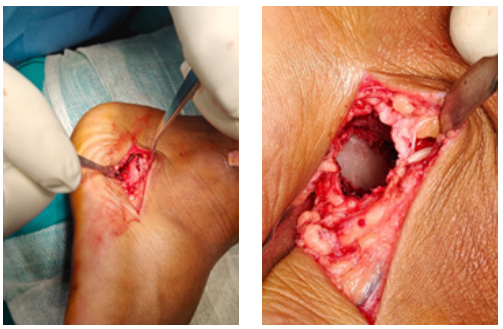
The management of intraosseous lipomas of calcaneum is mostly done by curettage and bone grafting. Usually after failure of a conservative treatment trail, which is quite common in these patients, the management is done by curettage of the cavity with or without filling of the cavity with bone graft or its substitutes [10,11]. Alternatives for reconstruction of the cavity after curettage are many like bone cement, autologous bone grafts or bone substitutes all having reported good results. In our patient we did a through curettage followed by meticulous packing of the cavity by morselized cancellous bone graft slivers. The patient had an excellent outcome postoperatively, with resolution of symptoms and full incorporation of the bone graft, thus highlighting the effectiveness of curettage and bone grafting in such patients. Similar results were obtained by Greenspan et al and Marwadi et al who gave good results with bone graft incorporation [11,12].

Pre op x-ray of the patient showing a well-defined lytic lesion in the calcaneum with cockade signed



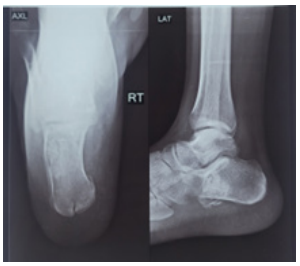


MRI sections of calcaneum showing a well-defined lesion of 2.4x2.1 cm size with narrow transition zone and sclerotic margins.



Lesion approached from the laterals aspect and the cavity as seen after curettage

Immediate postop xray



Xrays at 2 months

X-rays at 6 months

Conclusion

This case highlights the successful management of an intraosseous lipoma of the calcaneum in a young male patient. Curettage followed by cancellous bone grafting is an effective treatment, leading to symptom relief, structural restoration of the bone, and excellent functional recovery. Our study was subject to certain limitations and biases. It was a retrospective study and the technique was not randomized, However we report a case with a good follow-up and favourable results highlighting the importance of curettage and bone grafting in patients of intraosseous lipoma of calcaneum.

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