

CASE REPORT

Bilateral Intraosseous Tumor of the Calcaneus with Imaging-Pathologic Discordance A Case Report and Literatures Review

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Abstract

A case of bilateral intraosseous tumor of the calcaneus with different MRI imaging is presented. On the left, radiological findings suggest intraosseous lipoma, but on the right-sided lesion, imaging studies were not convincing. The microscopic report showed foreign body granulomatous reaction, a rare clinical pathological discordant.

Key words: Bone tumor, Calcaneus, Intraosseous lipoma

Introduction

Intraosseous lipoma is a rare benign tumor of the skeleton, despite the abundant adipose tissue found in bone marrow (1). Of more than 6000 bone tumor cases reported at the Mayo Clinic, Dahlin observed only seven of these tumors below 0.1% of bone neoplasm (2). However, this probably is not the actual incidence number because the lesions are frequently asymptomatic. In the consultation cases seen at the Mayo Clinic, the calcaneus appeared to be a prevalent site and it was the second most common site in Milgram's case series (2, 3).

We report an exceptional occurrence of a lipoma in both calcanei with discordance between the pathological report and our clinical diagnosis based on multi-method imaging.

Case Report

A 26-year-old woman with bilateral heel pain sought medical advice in our orthopedic clinic. A lateral X-ray revealed bilateral calcaneal osteolytic lesions in the antroinferior of both calcanei that were well defined and presented without sclerotic borders (Figure 1-1, 1-2). Next, a CT-scan was done, showing osteolytic lesions in the antroinferior area of both calcanei. On the right we saw a latent benign unicameral lesion without an obvious pattern of cortical erosion, but with minor cortical expansion. We also saw a thin sclerotic border that suggested a unicameral bone cyst (Figure 2-1, 2-2). There were scattered areas of fine calcification,

especially at the periphery of the cyst that suggested other differential diagnoses for the lesion like a chondroid tumor.

On the left we observed a septated multi-cavitary lytic bone lesion that also had a latent benign nature, but there was a heterogeneous central pattern with an obvious central area of amorphous calcification. So, at the top of our differential diagnosis list was an intraosseous lipoma, followed by a multi-cavitary bone cyst (Figure 3-1, 3-2).

MRI imaging of the right side was compatible with a bone cyst (Figure 4-1, 2), but on the left side we found a heterogeneous lesion with mostly fat density and intralésional calcification that suggested lipoma (Figure 5-1, 2).

Treatment

The patient's heel pain did not subside after 6 weeks of non-surgical therapy and at the right calcaneus there was a possible risk of pathologic fracture. Hence, she was scheduled for an intra operative frozen section biopsy, curettage and bone grafting.

Surgery was performed under general anesthesia. The patient was placed in the supine position and a pneumatic tourniquet was used. The modified Ollier approach was made over the lateral wall of the calcaneum (4). The lateral wall of the calcaneum was elevated with a sharp osteotome, then curettage of the tumor cavity was performed and a sample was sent for frozen section

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Figure 1-1. lateral calcaneal view of right foot.



Figure 1-2. lateral calcaneal view of left foot.

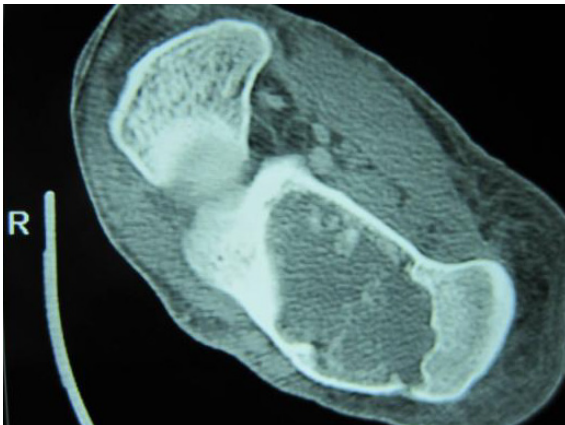
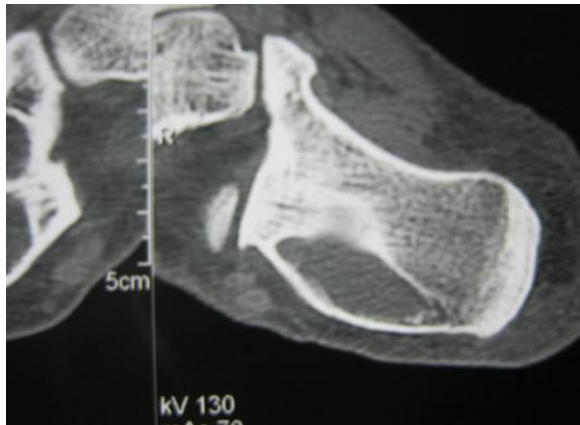


Figure 2-1,2. Right side CTscans.



evaluation. We used a power burr to enlarge the cavity in all directions. Next, we removed the corticocancellous bone graft from the left iliac wing and mixed it with 10 cc cancellous allograft and the calcanei cavities were filled with auto-allograft mixture.

Partial weight bearing was permitted the day after surgery. After three months, full weight bearing was

permitted, the healing process took place as desired, and on follow up x-rays there were no signs of tumor recurrence (Figure 6-1, 6-2).

Pathology Report

Slides show sections of fibro-connective tissue having cholesterol clefts surrounded by chronic inflammatory

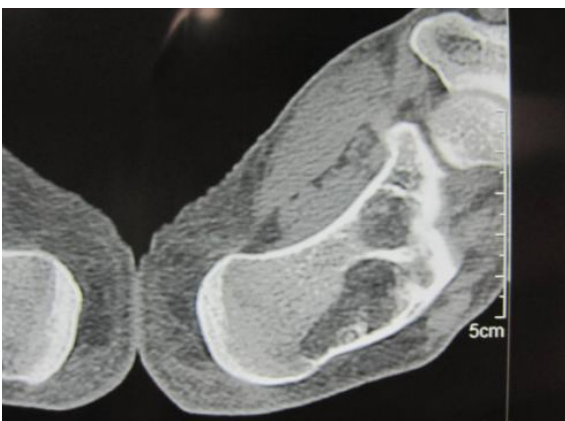
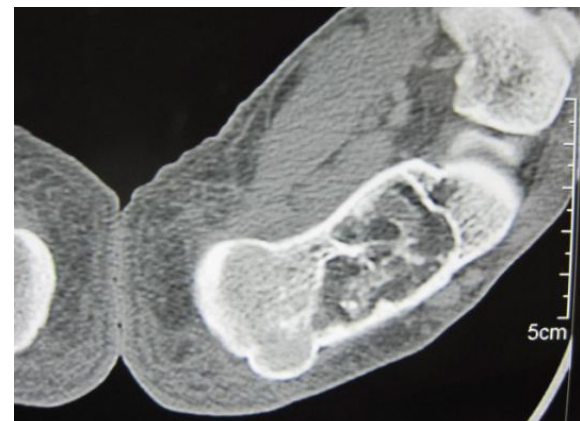


Figure 3-1,2. Left side CT scan.



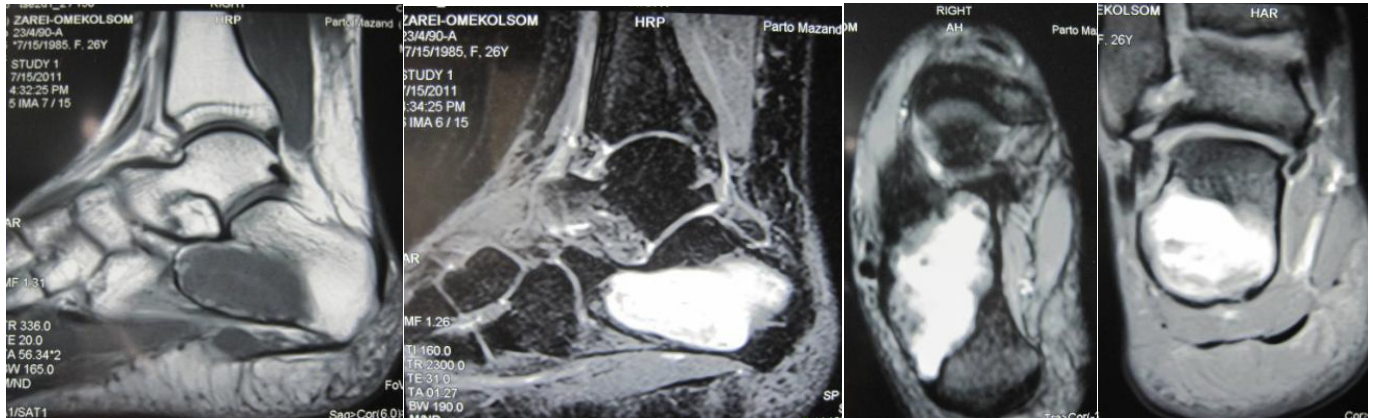


Figure 4-1,2,3,4. Right side MRI.

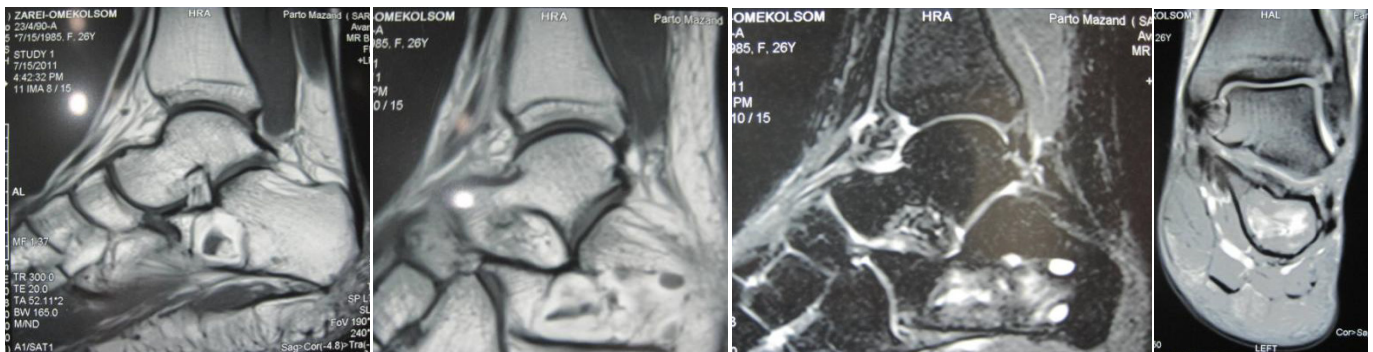


Figure 5-1,2,3,4. Left side MRI.

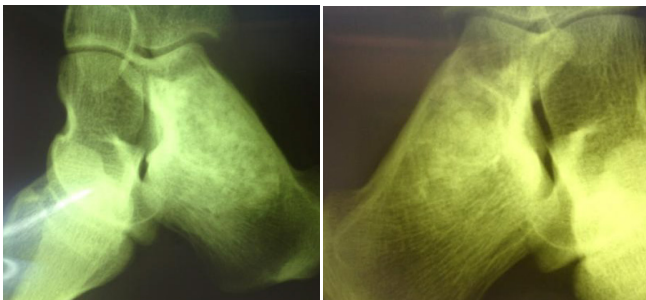


Figure 6-1,2. Post operative radiographs.

cells and scattered multinuclear giant cells mostly compatible with foreign body reaction (Figure 7-1, 2). Histological diagnosis was bilateral calcaneal foreign body reaction.

Discussion

Blacksin et al. showed that observing fat within intraosseous lipoma aids in diagnosis (5). MRIs and CT scans can be diagnostic, whereas simple radiography can be ambiguous, especially if there is necrosis within a lesion.

The symptoms linked to this lesion are usually not specific, and in most cases the lesion is discovered as an incidental finding on an x-ray study performed in a

completely asymptomatic patient (6). Sometimes, the lesion may be diagnosed because of pain and minor local swelling (7). In our case, the tumors were discovered on a radiograph performed because of the patient's heel pain.

With regard to treatment, some authors believe that no treatment should be considered for these tumors (8,9). Several others recommend, if there are any symptoms, carrying out curettage and filling the cavity with bone graft (10). After surgery, in Milgram's study, no cases were known to recur; however, in a subsequent report malignant transformation was described (11). The appearance of these lesions on radiographs, CT scans and MRIs can vary because of their degree of involution and necrosis (12).

Radiologically, we placed the left side lesion in Milgram stage II intraosseous lipoma with central necrosis and amorphous calcification, but on the right calcaneus, because of the rare possibility of a different nature of the patient's tumors, our diagnosis was intraosseous lipoma with massive necrosis and post necrosis liquefaction. This feature was compatible with Milgram stage III with cystic degeneration (9).

The pathology report was improbable for our diagnosis. In Milgram stage II we expect transitional cases with partial fat necrosis and focal calcification, but also regions of viable lipocytes and in stage III we expect involutional changes with variable degrees of

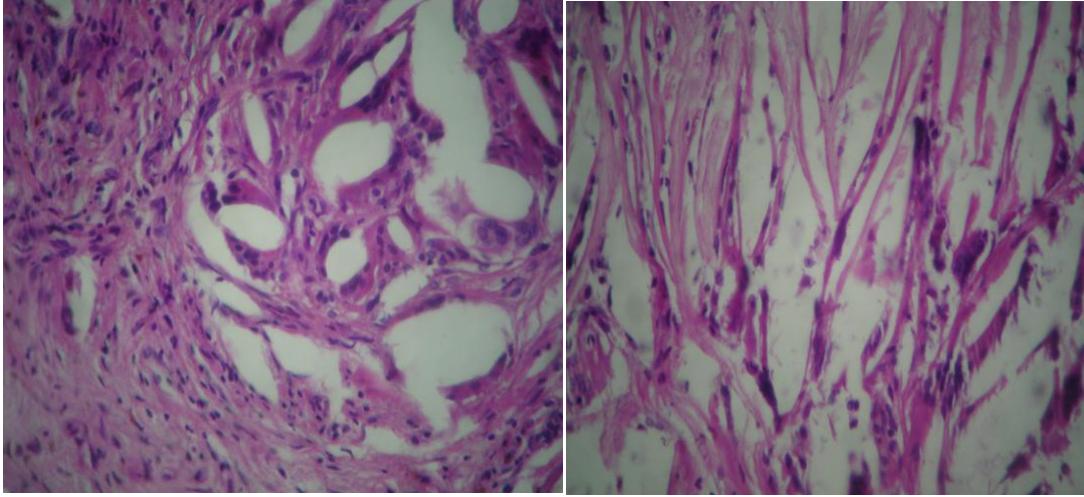


Figure 7-1,2.

fat necrosis, cyst formation, calcification, and reactive new bone formation. None of these pattern were mentioned in our pathology report, so there was a radiologic-pathologic discordant. The helpful finding in the pathology report was the similarity of both tumors that convinced us that the right side tumor was also an intraosseous lipoma.

Calcaneal intraosseous lipoma is a benign lesion that may cause diagnostic challenges.

Radiographic diagnosis of a lipoma may not be straightforward and so there may be differential diagnosis that may include simple bone cyst, non-ossifying fibroma, aneurysmal bone cyst, bone infarct and even chondroid tumors. The appearance of these lesions on radiographs, CT scans and MRIs can vary as result of their degree of involution and necrosis. Although biopsy and pathological evaluation is the most important method to obtain exact diagnoses of tumoral lesions, it might be equivocal. Therefore, it is important to make a correct diagnosis on the basis of multi-method imaging studies, especially MRI. Also, the correct diagnosis of an incidentally discovered calcaneal

intraosseous lipoma prevents an unnecessary biopsy and treatment in selected cases.

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References

1. Campanacci M, Enneking WF. Bone and Soft Tissue Tumors: Clinical Features, Imaging, Pathology and Treatment. 2nd ed. Berlin: Springer; 1999:683-9.
2. Unni KK, Inwards CY. Dahlin's bone tumors: general aspect and data on 10165 Cases. 6th ed. Philadelphia: Lippincott Williams & Wilkins; 2006: 298-300.
3. Milgram JW. Intraosseous lipomas. Clin Orthop Relat Res. 1988; 231:277-302.
4. Robert K, Heck Jr. Bone tumor In: Canale ST, Beaty JH, editors. Campbell's Operative Orthopaedics. 11th ed. Philadelphia: Mosby, Elsevier; 2008:29.
5. Blacksin MF, Ende N, Benevenia J. Magnetic resonance imaging of intraosseous lipomas: a radiologic-pathologic correlation. Skletal Radiol. 1995;24:37-41.
6. Eyzaguirre E, Liqiang W, Karla GM, Kumar R, Ayala A, Zoran G. Intraosseous lipoma. A clinical, radiologic, and pathologic study of 5 cases. Ann Diagn Pathol. 2007; 11(5):320-25.
7. Campbell RSD, Grainger AJ, Mangham DC, Beggs I, The J, Davies AM. Intraosseous lipoma: report of 35 new cases and a review of the literature. Skeletal Radiol. 2003; 32: 209-22.

8. Kozlowski K, Welshman R. What is it? Intraosseous lipoma in a 13-year-old boy. *Br J Radiol.* 1991; 64:855-6.
9. Bagatur AE, Yalcinkaya M, Dogan A, Gur S, Mumcuoglu E, Albayrak M. Surgery Is Not Always Necessary in Intraosseous Lipoma. *Orthopedics.* 2010; 33(5):306.
10. Milgram JW. Intraosseous lipomas. radiologic and pathologic manifestation *Radiology.* 1988;167:155-60.
11. Milgram JW. Malignant transformation in bone lipomas. *Skeletal Radiol.* 1990; 19:347-76.
12. Propeck T, Bullard M.A, Lin J, Doe K, Martel W. Radiologic-pathologic correlation of intraosseous lipomas. *AJR. Sep.* 2000;175:673-8.