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An Incidental finding of Intraosseous Lipoma of Ilium: A Rare Case Report and Literature Review

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Abstract **Case Report**

Intraosseous lipoma is a very rare benign bone lesion, which constitutes not more than 0.1% of all bone tumors. The majority of cases are located in the metaphyseal region of the long bones in the lower limbs and is usually identified as an incidental roentgenographic finding. We report a rare case of intraosseous lipoma of the ilium in a 33‑year‑old male, accidentally discovered during a lumbar MRI for hyperalgesic sciatica, the diagnosis was established due to the characteristic radiological features objectified by MRI and CT.

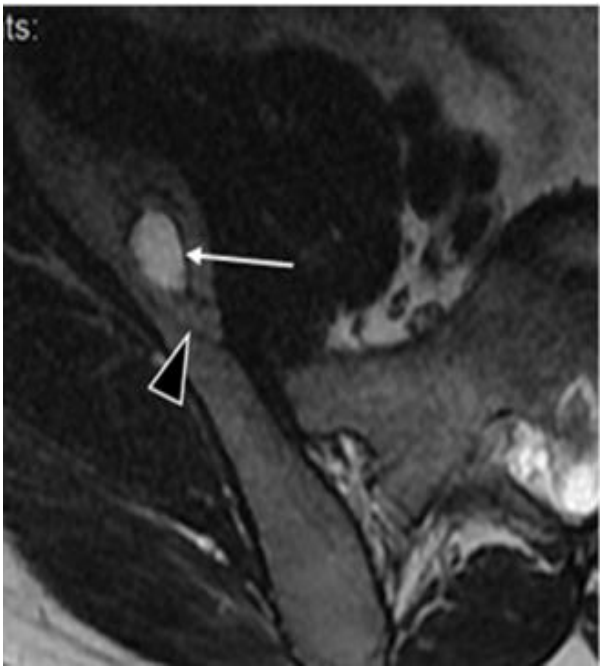
Keywords: Intraosseous Lipoma, Imaging, Bone Tumor, Ilium.

INTRODUCTION

Lipomas are common benign soft tissue neoplasm composed of mature adipose tissue with no evidence of cellular atypia. Benign lipomas can affect bone, joint, tendon sheath and other soft tissues. Intraosseous lipoma is among the rarest primary bone tumors (1). The incidence of osseous lipoma constitutes less than 0.1% of bone tumors (2). The majority of such tumors present in the metaphysis of long bones in the lower limbs, frequently with minor symptoms, usually pain, while the asymptomatic ones are incidentally discovered (3). Radiographically, these lesions may mimic other entities essentially cystic ones. Generally, the prognosis is excellent, malignant transformation of these tumors is rare and recurrences have not been documented, so there is no need for surgery in most cases. We report a rare case of intraosseous lipoma of ilium that was incidentally diagnosed during an unrelated investigation.

CASE REPORT

A 33-year-old man, with no particular pathological history, especially. The patient presented to the emergency for hyperalgesic sciatica, resistant to medical treatment. On physical examination, Lasegue sign was positive without motor or sensitive deficit. Magnetic resonance imaging was requested. It showed a para median hernia at L4-L5 compressing the cauda equina. The MRI revealed also a bone lesion on the right iliac wing (Fig 1) in intermediate signal T2, similar to the signal of the bone marrow, fading on STIR weighted ponderation. It was surrounded by a fine border in hyposignal T2, and contains trabeculae on hyposignal on all sequences, and a central area on hypersignal T1 FATSAT, T2 and STIR related to a cystic degeneration.



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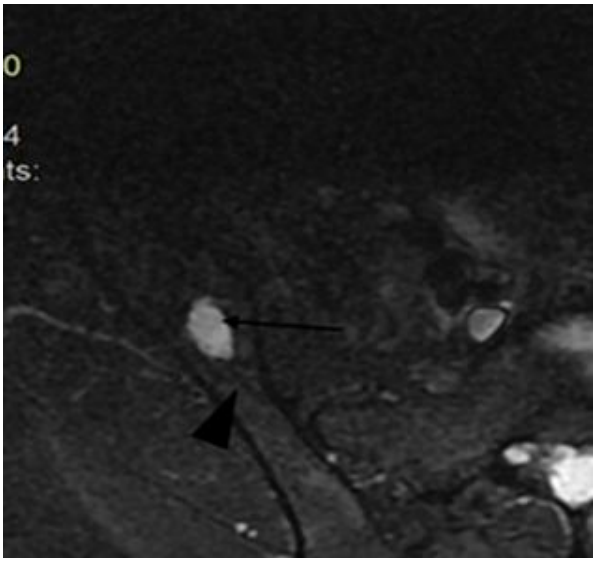

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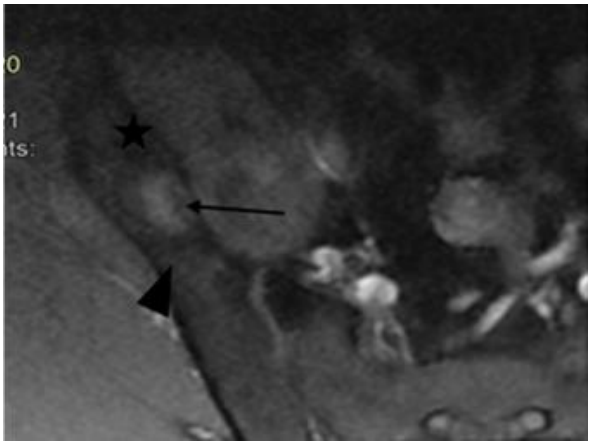

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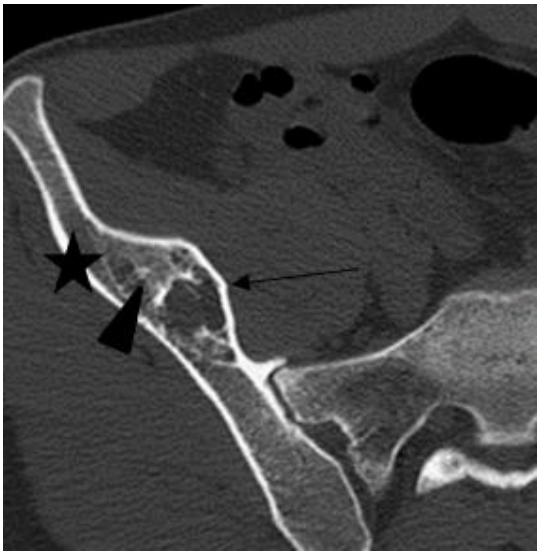
Fig-1: Axial T2-Weighted (**A)** MRI Image Shows A Bone Lesion Of The Right Iliac Wing, On Intermediate Signal Similar To The Bone Marrow Signal, Containing Trabeculae On Hyposignal (Stars) And A Central Area On Hypersignal (Arrows), Surrounded By A Fine Border In Hyposignal (Arrowheads). Axial STIR (**B**) And T1 FATSAT (**C**) Shows A Mucinous Cystic Central Area On Hypersignal (Arrows), Surrounded By A Fine Border In Hyposignal (Triangles).

A pelvic CT was performed to better characterize the ilium lesion (Fig-2). It depicts predominant low attenuation with focal areas of intermediate attenuation and prominent trabeculae within the lesion, which is surrounded by a thin rim of sclerotic bone.



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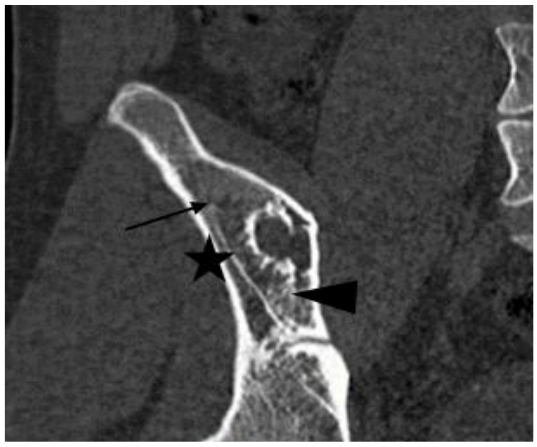

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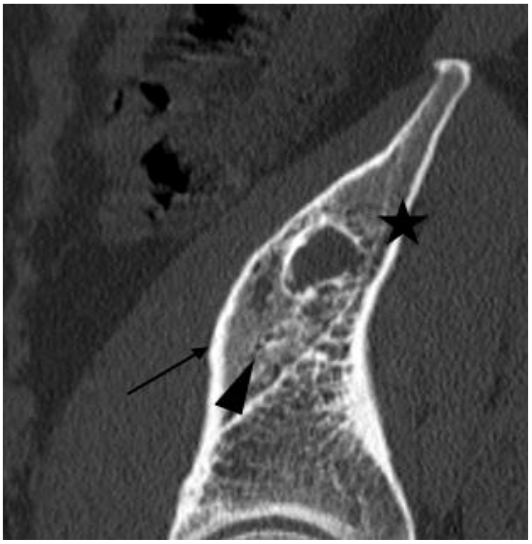

C

Fig-2: computed tomography in axial (A), frontal (B) et sagittal (C) sections shows a geographic ilium lesion with predominant low attenuation, focal areas of intermediate attenuation and several trabeculae within the lesion(arrowheads), which is limited by a thin rim of sclerotic bone (stars), and solid periosteal reaction (arrows) without cortical destruction.

CT and MRI findings made it possible to make the diagnosis of an intraosseous lipoma with cystic degenerative changes.

The attitude adopted for this patient is therapeutic abstention since the patient is asymptomatic with annual monitoring.

DISCUSSION

Intraosseous lipoma is a rare benign type of bone tumor, representing, according to some authors, no more than 0.1% of all benign bone tumors (2). However, the incidence may be greater because of not diagnosed cases of this type of lipoma which are often asymptomatic (4).The age range of patients at presentation is wide, from 10 to 80 years old, the most usual age being about 40. There is no obvious difference in distribution between different sexes. The calcaneus and long tubular bones, especially the femur, tibia and fibula, are the common anatomical locations (5), However, primary from ileum is extremely rare, and the first report was made by Buckley and Burke in 1988 (6).

Most lesions are asymptomatic. Thus, this disease is usually discovered incidentally on radiographs while unrelated disorders or injuries are investigated. A few patients have some symptoms such as pain or swelling. It has been reported that nerve compression symptoms can be induced by expansion of the tumor (5).

Histologically, these tumors are composed of mature adipose cells, which are slightly larger than the non-tumorous ones, and may include single spindle cells, regressive lesions (foci of fat necrosis, cystic spaces, and dystrophic calcifications) and bone trabeculae undergoing resorption (7).

Milgram (8) outlined a three-stage classification system for intraosseous lipomas. Stage I lesions consist of viable enlarged fat cells organized into lobules resembling mature adipose tissue. The adipocytes replace the normal bone marrow and encase the preexisting trabeculae. Stage II lesions also consist of viable lipocytes but are distinguished from stage I lesions in that they contain areas of partial fat necrosis. The fat necrosis is associated with calcification and formation of reactive bone. Stage II and III lesions demonstrate significantly more resorption of trabecular bone than stage I lesions. Stage III lesions are further differentiated by near-complete or complete involution of the lipoma and a thicker, more radiodense border. Cyst formation is more characteristic of stage III lesions and is due to myxomatous degeneration of fat cells. The cystic areas can be small or constitute a large part of the lesion (8, 9). the lesion that has been described in our case is in stage III.

Radiological images of intraosseous lipomas are usually uncharacteristic. Because of the different presentational stages. The imaging characteristics of stage I lesions are dictated by their fat content. On radiographs, the lesion appears lucent because it consists predominantly of mature adipose tissue. On CT images, the lesion has CT attenuation coefficients consistent with the range for fat (9). On MR images, lesions show homogeneous hyperintense fat signal on T1- and T2-weighted MR images that will be entirely suppressed by STIR or fat saturated sequences. The trabecular cancellous bone pattern is typically absent within the lesion (10). The imaging characteristics of stage II and III lesions are due to fat necrosis and dystrophic calcification, which appear as regions of increased density on radiographs and increased attenuation on CT images. On MR images, areas of fat necrosis have variable signal intensity on T1-weighted images and high signal intensity on T2-weighted images; such areas may undergo complete cystic degeneration, as like as the lésion described in our case. Areas of calcification show low signal intensity on both T1- and T2-weighted images. In stage II and III lesions, evidence of expansile remodeling is more likely to be seen and helps distinguish these lesions from osseous infarcts. Stage III lesions show a greater degree of involution, which manifests as more extensive areas of fat necrosis and calcification, a thicker peripheral zone of reactive sclerosis, and greater cystic changes (9). However, in cases with substantial secondary involution and necrosis, biopsy may be necessary to confirm the diagnosis (11).

The stage of the lesion affects the list of differential diagnosis(4,12). Any expansile bone lesion such as simple bone cyst, aneurysmal cyst, fibrous dysplasia and chondromyxoid fibroma may be confused with stage I lesions. CT and MRI constitute helpful diagnostic tools, as they can easily demonstrate the fat contents of the lesion. Central bone calcification suggests the diagnosis of lipoma in this location. When involution has occurred, bone infarct and enchondroma must be considered in the differential diagnosis (4). Differently from infarct, lipomas may expand bone contours and may cause bone resorption. Additionally, lipomas may undergo cystic degeneration; infarcts always consist of the same bone tissue that was present before infarction. Radiographically, enchondromas may mimic stage III lipomas. Both lesions situated in a same region can slowly and asymptomatically expand a bone, presenting with an intense centrally located calcification. Fortunately, tissue examination can lead to the diagnosis, considering that lipomas contain no cartilage tissue. Osteoblastoma and giant cell bone tumor also should be considered in the differential diagnosis of uncommon ossifying lipomas (4, 12).

Asymptomatic lesions do not need surgical treatment and some of them can undergo involution spontaneously. Cases with imminent fractures are treated by curettage and bone grafting. There are no recurrences after surgical therapy (13). If a lesion comes under suspicion for potential malignancy followed by history, clinical and imaging findings, surgical treatment and biopsy must be made (14). In our case, we did not perform biopsy and radiological follow-up was approached.

CONCLUSION

Intraosseous lipoma is a rare benign bone lesion that is difficult to diagnose on plain radiographs alone because it may be confused with other bone lesions. However, imaging modalities including MRI and CT scan are necessary for the confirmation of the diagnosis that leads to correct decision making without the need for more diagnostic procedures such as bone biopsy and surgery.

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