

## Abstract

Lipomas are benign bone tumors formed by fat tissue. They are usually a bone local tumor. MRI shows that a typical signal for fat is useful for diagnosis. Curettage is the definitive treatment.

## Keywords

Benign bone tumor • Lipoma

Lipoma is a very frequent lesion in soft tissues but a rare intraosseous benign bone tumor formed by mature fat cells.

They can be found in various bones such as the femur, tibia, pelvis, mandibles and are mostly calcaneus [1]. Multiple intraosseous lipomatoses have also been reported [2].

## Macroscopic Pathology

Lipomas are well circumscribed and sometimes lobulated. The lesion is best described as a glistening yellow, soft mass of adipose tissue. The gross findings are determined by the stage of the lesion. In 1988 Milgram et al. [3] reported the largest series of bone lipomas and defined three progressive stages. The principal findings are: stage I lesions, the adipose tissue predominates with a few bony trabeculae; stage II lesions have more calcifications or ossifications; and stage III lesions consists of adiponecrosis, well-formed cysts, sometimes extensive calcification and an sclerotic rim of reactive bone.

## Microscopic Pathology

Intraosseous lipomas are made of mature adipocytes with scattered intertwining bone trabeculae. They may be missed because median age normal bone marrow has prominent adipose tissue. Moreover, the lesion is curetted in the majority of cases, and without information regarding the radiological aspect of the lesion it is very difficult to identify a lipoma. As it occurs with the gross finding the microscopic features vary with the stages. Stage I lesions are predominantly adipose; stage II lesions show partially calcified focal adiponecrosis or ischemic bone formation; and stage III lesions demonstrate extensive adiponecrosis, massive ischemic bone formation and dark purple calcification, and cysts.

## Microscopic Differential Diagnosis

Intraosseous lipoma differential diagnosis includes fatty bone marrow and bone infarct. The roentgenographic information is most useful in making the right diagnosis. The calcification is similar to that seen in infarcts, but in infarcts it is peripheral. Most of them are found incidentally or with local pain.

## Imaging

An X-ray shows a well-defined lytic bone lesion with a surrounding osteosclerotic border around. MRI shows a typical high signal in T1; also in T2 if there is central

A. Solar (✉)  
Pontificia Universidad Católica de Chile, Santiago, Chile  
e-mail: [asolar@med.puc.cl](mailto:asolar@med.puc.cl)

necrosis and no signal in STIR [4], characteristic MRI signals for fat.

---

## Treatment

This consists of observation if the tumor is asymptomatic and located in a region without risk of fracture. Curettage and filling the cavity with bone graft is the definitive treatment.

## References

1. Narang S, Gangopadhyay M. Calcaneal intraosseous lipoma: a case report and review of the literature. *J Foot Ankle Surg.* 2011;50(2):216–20.
2. Rehani B, Wissman R. Multiple intraosseous lipomatosis, a case report. *Cases J.* 2009;2:7399.
3. Milgram JW. Intraosseous lipomas: radiologic and pathologic manifestations. *Radiology.* 1988;167:155–60.
4. Blacksin MF, Ende N, Benevenia J. Magnetic resonance imaging of intraosseous lipomas. *Skeletal Radiol.* 1995;24(37):41.