Liposarcoma of Bone

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Ricardo K. Kalil

Abstract

Liposarcoma is an exceedingly rare malignant intraosseous neoplasm, constituted by adipose cells, that can also arise on the surface of the bone. The long bones of extremities are usually affected. The nonspecific image findings of liposarcoma in bone can be seen in various other benign and malignant bone lesions. Histologically, it is similar to soft tissue variants of liposarcomas. Immunohistochemically, MDM2/CDK4 is usually positive. Well-differentiated and myxoid liposarcomas, the two most common types, have a more favorable prognosis than the other histological types. Treatment includes wide resection or amputation.

Definition

- An exceedingly rare malignant intraosseous neoplasm, constituted by adipose cells, which can also arise on the surface of bone.

Etiology

- Unknown.
- It may arise from preexisting lipomas.

Epidemiology

- Liposarcoma of bone is an exceedingly rare tumor.

Age

- It can be seen at any age but is more common in adults.

Sex

- There is a slight male predominance.

Sites of Involvement

- Almost all cases reported are in the long bones, especially femur and tibia.

Clinical Symptoms and Signs

- Pain and the presence of a mass are the usual symptoms.
- Pathological fracture may occur.

Image Diagnosis

- Radiographs show a lucent mass that may or may not present well-defined margins, including cortical permeation.
- CT and MRI of the tumor show features characteristic of fat tissue.

R.K. Kalil, MD
Laboratory of Orthopaedic Pathology, Buenos Aires, Argentina

Department of Pathology, A.C. Camargo Cancer Center,
São Paulo, SP, Brazil
e-mail: rkkalil@gmail.com

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Image Differential Diagnosis

- The nonspecific image findings of liposarcoma in bone can be seen in various other benign and malignant bone lesions.

Pathology

Gross Features

- The cut surface shows a lobulated, yellow to white, and soft or firm lesion, with well- or poorly defined margins. It is usually a large lesion.
- Some lesions may present myxoid, mucinous features.

Histological Features

- Similar to soft tissue variants of liposarcomas:
  - Atypical lipomatous tumor/well-differentiated liposarcoma.

    Neoplastic tissue is very similar to normal fat. Atypical nuclei may be seen mostly in or near the spindle cell septae that traverse the neoplasia. A few lipoblasts are also seen.
  - Dedifferentiated liposarcoma

    Abrupt transition from low-grade lipogenic area to high-grade non-lipogenic morphology within a well-differentiated liposarcoma is seen. May have heterologous elements.
  - Myxoid liposarcoma

    It may be constituted by two neoplastic tissue patterns, a richly arborizing vascularized myxoid pattern and a round cell pattern. Patterns may be seen alone or in variable mixture in a particular tumor.
  - Pleomorphic liposarcoma

    Highly anaplastic fat cells characterize this variant.

Pathology Differential Diagnosis

Lipoma

- It may be difficult to differentiate from well-differentiated liposarcoma in a limited sample.

Ancillary Techniques

- MDM2/CDK4 are usually positive together or individually in liposarcomas. Pleomorphic liposarcomas differ from the dedifferentiated variant by expressing only one marker.

Genetics

- Supranumerary ring or long marker chromosomes in well-differentiated liposarcomas.
- Translocation t(12;16) is common in myxoid/round liposarcoma. Fusion of DDIT3 (CHOP) and FUS (TLS) genes. Translocation t(21;22) rarely.
- Amplification of 12q14.2–21.2 includes the HMGA2 and MDM2 gene regions.
- Various aberrations of 12q13–15 were described in lipomas.
- Pleomorphic liposarcomas present complex karyotypes.
- Amplification of 1q21.2–31.2 was described in a parosteal liposarcoma.
- Abnormalities in the AKT genes were found to correlate with clinicopathological profile of tumors.

Prognosis

- Well-differentiated and myxoid liposarcoma, the two most common types, have a more favorable prognosis than the other histological types.

Treatment

- Wide resection or amputation

Images

See Figs. 42.1, 42.2, 42.3, 42.4, 42.5, 42.6, and 42.7 for illustrations of liposarcoma of bone.

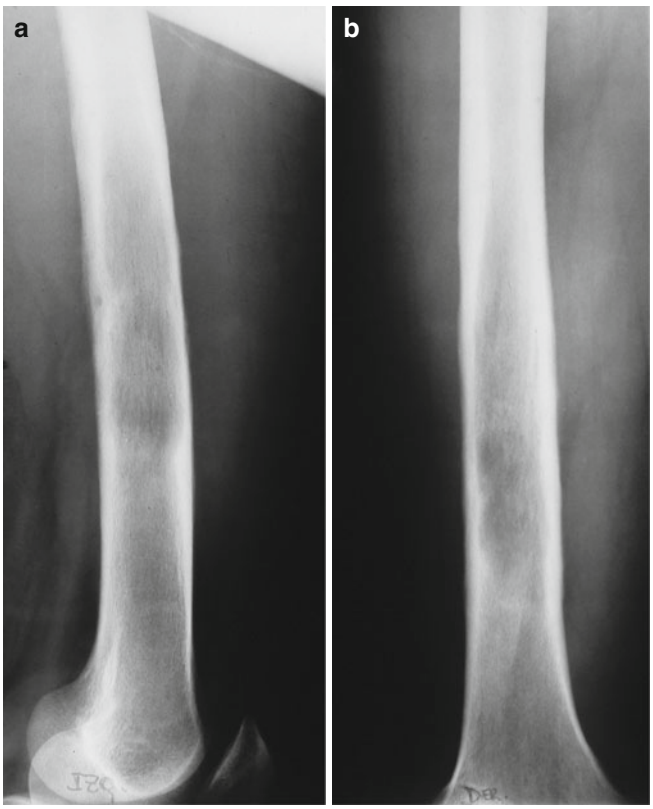

Fig. 42.1 (**a**, **b**) Radiographs of a liposarcoma of the femur. Uncharacteristic lucent mass in the medullary compartment with some endosteal scalloping and undefined limits

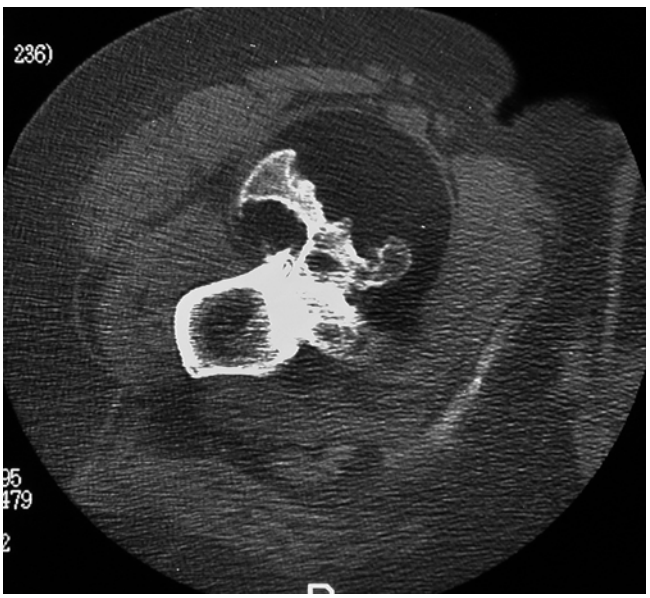

Fig. 42.2 CT scan of surface liposarcoma of the proximal femur. Well-circumscribed lucent lesion distorting the host bone external shape

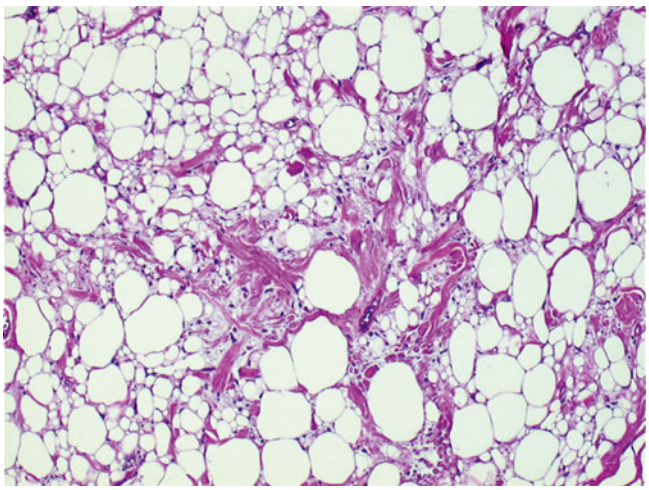

Fig. 42.3 Low-power microscopic view of well-differentiated liposarcoma

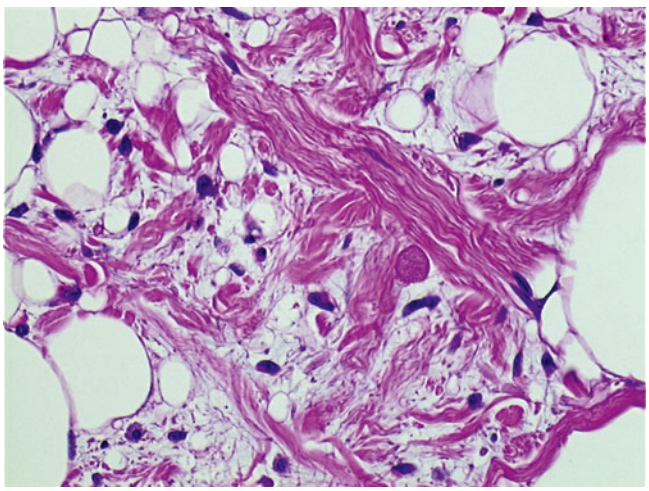

Fig. 42.4 Medium-power microscopic view of well-differentiated liposarcoma. Atypical cells are more easily found in the spindle cells septae of the lesion

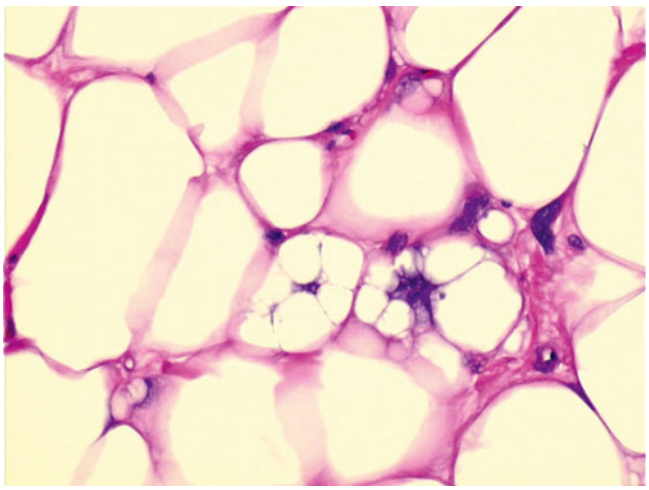

Fig. 42.5 High-power microscopic view of well-differentiated liposarcoma. There may be only a few atypical cell nuclei. Multivacuolated adipocytes and lipoblasts are also seen

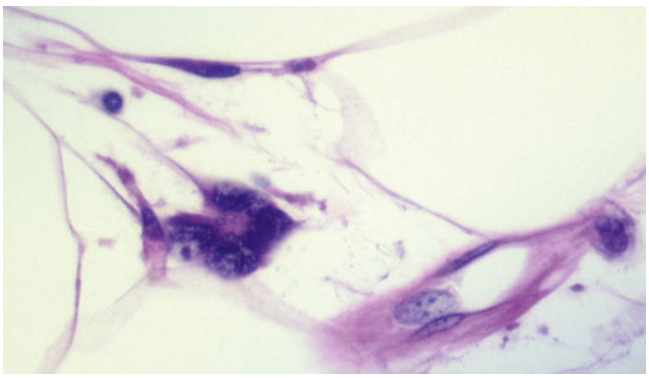

Fig. 42.6 High-power microscopic view of well-differentiated liposarcoma. Multiple atypical nuclei in adipocyte

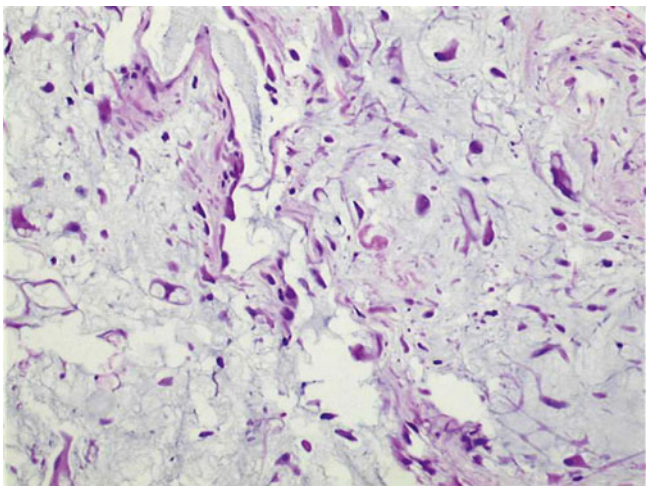

Fig. 42.7 Medium-power microscopic view of pleomorphic liposarcoma

Recommended Reading

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