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45.1 Definition

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

45.2 Etiology

- Unknown.
- It may arise from preexisting lipomas.

45.3 Epidemiology

- Liposarcoma of bone is an exceedingly rare tumor.
- It can be seen at any age but is more common in adults.
- There is a slight male predominance.

45.4 Sites of Involvement

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

45.5 Clinical Symptoms and Signs

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

45.6 Imaging Features

- Radiographs show a lucent mass that may or may not present well-defined margins, including cortical permeation (Fig. 45.1).
- CT and MRI of the tumor show features characteristic of fat tissue (Fig. 45.2).



Fig. 45.1 (a, b) Radiographs of a liposarcoma of the femur. Uncharacteristic lucent mass in the medullary compartment, with some endosteal scalloping and undefined limits

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Fig. 45.2 CT scan of surface liposarcoma of the proximal femur. Well-circumscribed lucent lesion distorting the host bone external shape

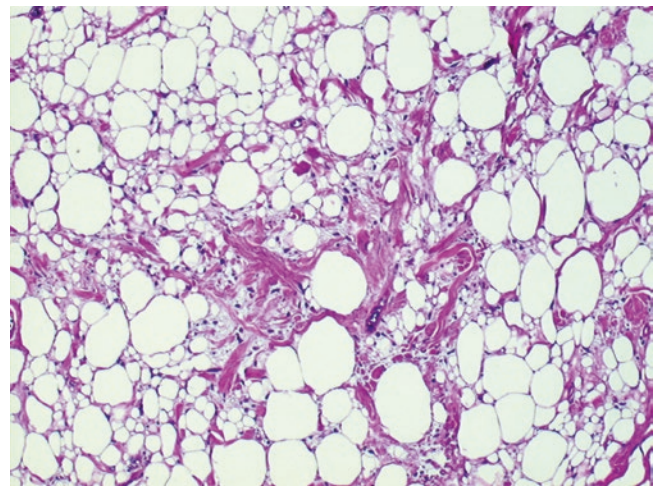


Fig. 45.3 Low-power microscopic view of well-differentiated liposarcoma

45.7 Imaging Differential Diagnosis

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

45.8 Pathology

45.8.1 Gross Features

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

45.8.2 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 (Figs. 45.3, 45.4, 45.5, and 45.6). A few lipoblasts are also seen.
 - *Dedifferentiated liposarcoma*

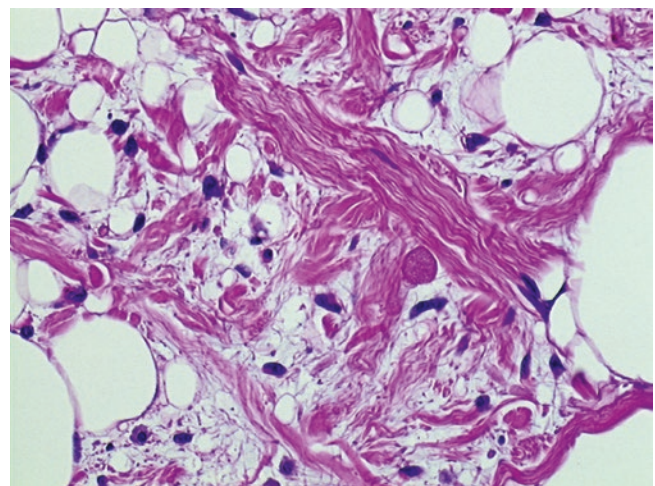


Fig. 45.4 Medium-power microscopic view of well-differentiated liposarcoma. Atypical cells are more easily found in the spindle cells septae of the lesion

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

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 (Fig. 45.7).

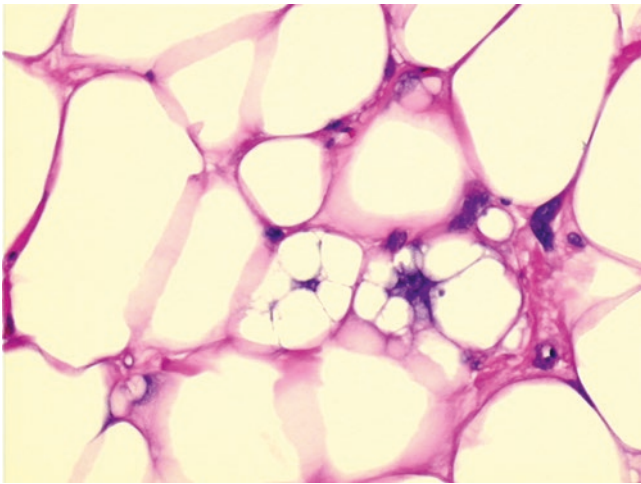


Fig. 45.5 High-power microscopic view of well-differentiated liposarcoma. There may be only a few atypical cell nuclei. Multivacuolated adipocytes and lipoblasts are also seen

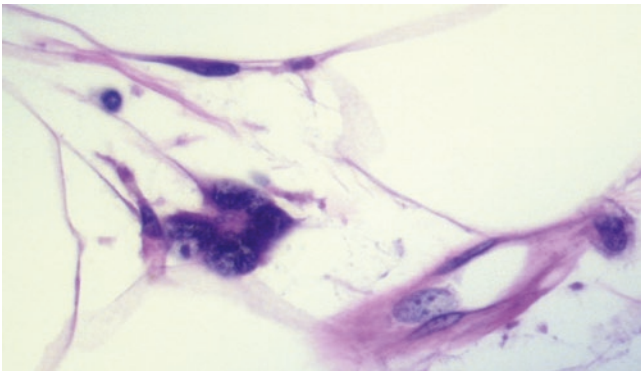


Fig. 45.6 High-power microscopic view of well-differentiated liposarcoma. Multiple atypical nuclei in adipocyte

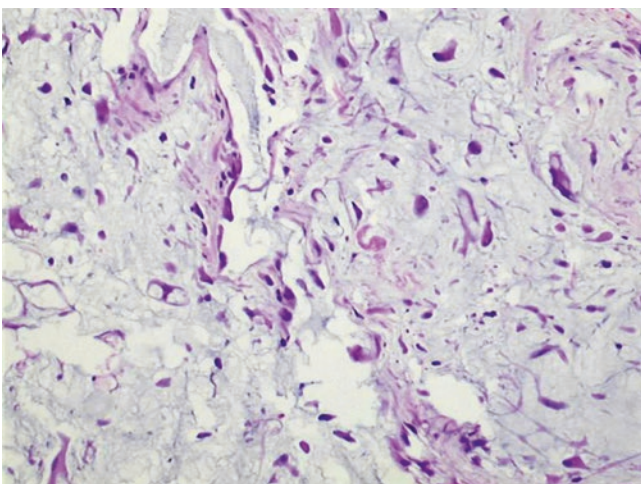


Fig. 45.7 Medium-power microscopic view of pleomorphic liposarcoma

45.9 Pathologic Differential Diagnosis

45.9.1 Lipoma

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

45.10 Ancillary Techniques

- MDM2/CDK4 are usually positive together or individually in liposarcomas. Pleomorphic liposarcomas differ from the dedifferentiated variant by expressing only one marker.
- FABP4/aP2, a recently reported sensitive adipocytic marker, is strongly positive.

45.10.1 Genetics

- Supranumerary ring or long marker chromosomes are found 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 the clinicopathological profile of tumors.

45.11 Prognosis

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

45.12 Treatment

- Wide resection or amputation.
- Any type of liposarcoma, including well-differentiated, can metastasize. Follow-up and screening are required.

Suggested Reading

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