

## Primary Non-Hodgkin's Lymphoma of the Femur

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**A** 35-year-old woman in her third trimester of pregnancy presented with pain associated with motion of her knee. There was no history of trauma or penetrating injury. Physical examination revealed intact strength, sensation, and reflexes. Radiography (Fig. 1A) revealed mixed lytic and sclerotic lesions in the medial and lateral femoral condyles of the femur, a finding confirmed on CT (Fig. 1B) and MR imaging (Fig. 1C). CT-guided needle biopsy obtained only heme.

Open-biopsy curettage was performed, followed by allograft bone packing with corticocancellous chips. Histopathology revealed a dense lymphoid infiltrate (Fig. 1D); immunoperoxidase staining of frozen sections showed large, atypical cells that stained positive for CD20, confirming the diagnosis of diffuse large B-cell lymphoma. CT of the chest, abdomen, and pelvis was deferred until after pregnancy, and findings were unremarkable at that time. The final clinicopathologic diagnosis was primary non-Hodgkin's lymphoma of the femur.

Primary lymphoma of the bone accounts for approximately 3% of malignant bone neoplasms [1] and comprises less than 5% of all extranodal non-Hodgkin's lymphomas. Patients generally present with localized bone pain and, less frequently, soft-tissue swelling or a palpable mass. Signs of systemic disease, such as fever, weight

loss, and night sweats, are usually absent. Neurologic symptoms may exist if the spine is involved. Diagnosis of primary bone lymphoma includes initial involvement of a single bone (most commonly a long bone) without distant lymph node involvement or metastasis at or within 6 months of presentation and histologic evidence of lymphoma within the lesion [2].

On conventional radiography, primary lymphomas of bone are characterized as "mottled" or "moth-eaten" radiolucencies, corresponding to regions of marrow and cortical replacement by lymphoma cells [3]. Pathologic fracture may be present in approximately one quarter of the cases, pathologically related to weakened replaced cortex [2]. No pathologic fracture was identified in our patient. Bone marrow involvement is best seen on T1-weighted MR images, on which the high signal intensity of normal marrow fat contrasts with areas of low signal intensity corresponding to the lesion, which replaces fat [4].

At pathology, primary osseous lymphoma is typically of the diffuse B-cell subtype. A mixed-cell infiltrate or variation in cell size and shape can be seen in most bone lymphomas, which can help distinguish them from Ewing's tumor. Most often, the lymphoma is positive for B-cell markers, such as CD20, on immunoperoxidase staining.

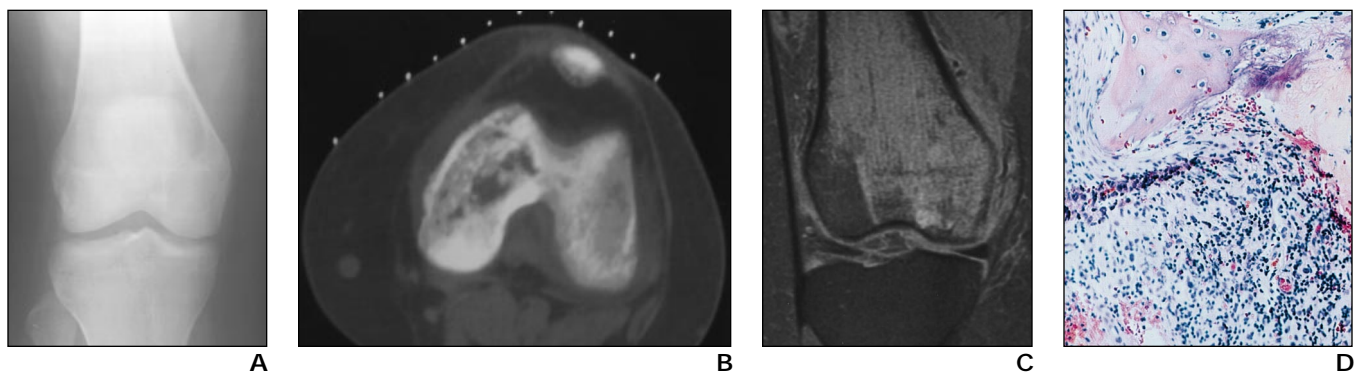
Although its incidence peaks in patients in their fifth decade, primary bone lymphoma can

occur in younger patients, as in our patient. It is slightly more common in men than women, and prognosis depends on the grade of the tumor at the time of diagnosis. Overall survival, however, is higher than 50% at 5 years for patients with single bone involvement only.

Treatment typically involves a combination of radiation and chemotherapy [3]. Interestingly, genetically engineered monoclonal antibodies against CD20 have been suggested for certain types of refractory non-Hodgkin's lymphoma; it remains to be seen whether such therapy will become a mainstay for the treatment of bone lymphoma.

## References

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**Fig. 1.**—35-year-old pregnant woman with pain on motion of knee.

**A**, Radiograph of distal femur shows mixed lytic and sclerotic lesion involving medial and lateral femoral condyles.

**B**, CT image reveals extensive nonexpansile mixed lytic and sclerotic lesions in medial and lateral femoral condyle epiphyses.

**C**, Sagittal T2-weighted MR image shows extensive mixed-signal lesions in medial and lateral femoral condyle epiphyses with surrounding edema. T1-weighted images (not shown) revealed findings consistent with marrow replacement and edema.

**D**, High-resolution photomicrograph shows bone fragments surrounded by dense lymphoid infiltrate, which is composed of large atypical cells (B cells) in background of small mature lymphocytes (T cells) and fibrosis. (H and E,  $\times 100$ )

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