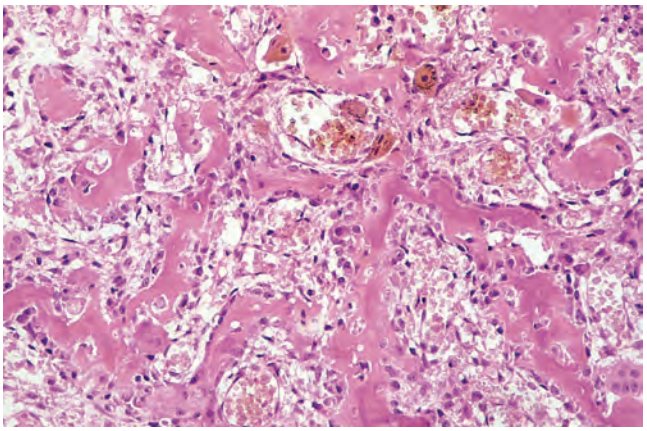

Figure 26-21 Osteoid osteoma composed of haphazardly interconnecting trabeculae of woven bone that are rimmed by prominent osteoblasts. The intertrabecular spaces are filled by vascularized loose connective tissue.

MORPHOLOGY

Osteoid osteoma and osteoblastoma are round-to-oval masses of hemorrhagic gritty tan tissue. They are well circumscribed and composed of randomly interconnecting trabeculae of woven bone that are prominently rimmed by a single layer of osteoblasts (Fig. 26-21). The stroma surrounding the neoplastic bone consists of loose connective tissue that contains many dilated and congested capillaries. The relatively small size, well-defined margins, and benign cytologic features of the neoplastic osteoblasts help distinguish these tumors from osteosarcoma. Osteoid osteomas elicit the formation of a tremendous amount of reactive bone, which encircles the lesion. The actual neoplasm (known as the nidus) manifests radiographically as a small round lucency that may be centrally mineralized (Fig. 26-22).

Osteosarcoma

Osteosarcoma is a malignant tumor in which the cancerous cells produce osteoid matrix or mineralized bone. It is the most common primary malignant tumor of bone, exclusive of myeloma and lymphoma, and accounts for approximately 20% of primary bone cancers. Osteosarcoma occurs in all age groups but has a bimodal age distribution; 75% occur in persons younger than 20 years of age. The smaller second peak occurs in older adults, who frequently suffer from conditions known to predispose to osteosarcoma—Paget disease, bone infarcts, and prior radiation. Overall, men are more commonly affected than women (1.6:1). Any bone can be involved. The tumors usually arise in the metaphyseal region of the long bones of the extremities, and almost 50% occur about the knee (i.e., distal femur or proximal tibia).

Osteosarcomas typically present as painful, progressively enlarging masses. Sometimes a sudden fracture of the bone is the first symptom. Radiographs usually show a large destructive, mixed lytic and blastic mass with infiltrative margins (Fig. 26-23). The tumor frequently breaks through the cortex and lifts the periosteum, resulting in reactive periosteal bone formation. The triangular shadow between the cortex and raised ends of periosteum, known radiographically as *Codman triangle*, is indicative of an aggressive tumor. It is characteristic but not diagnostic of osteosarcoma.

Pathogenesis. Approximately 70% of osteosarcomas have acquired genetic abnormalities such as complex structural and numerical chromosomal aberrations. Molecular studies have shown that these tumors usually have mutations in

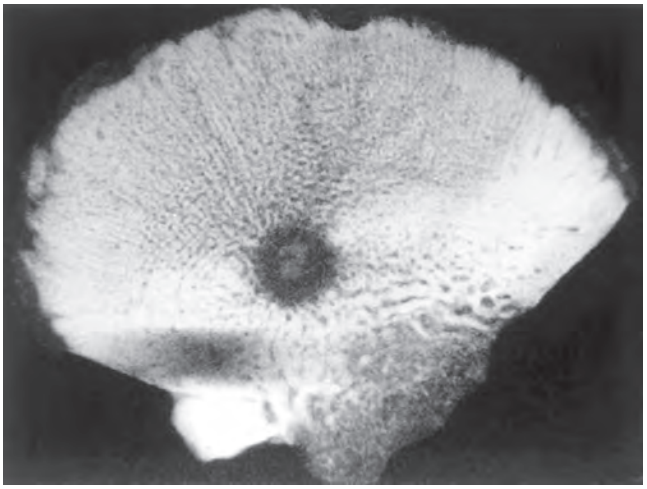

Figure 26-22 Specimen radiograph of intracortical osteoid osteoma. The round radiolucency with central mineralization represents the lesion and is surrounded by abundant reactive bone that has massively thickened the cortex.

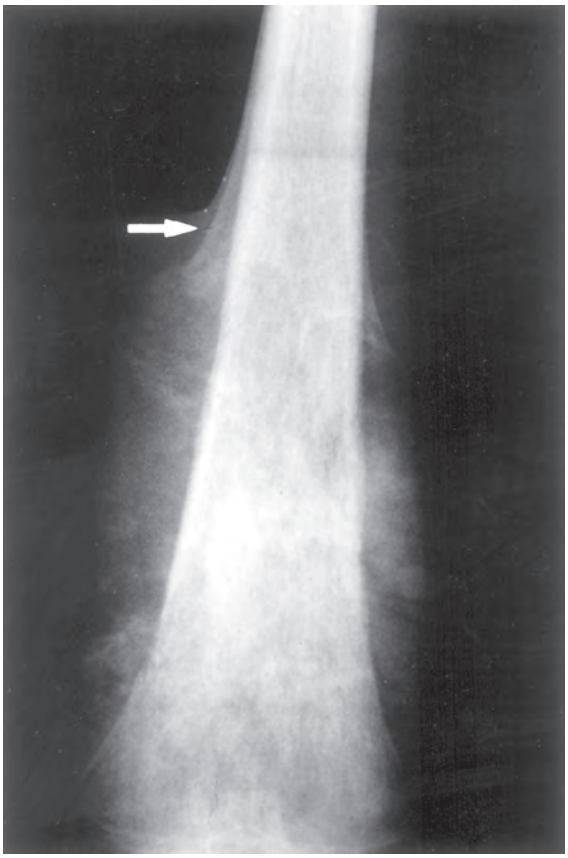

Figure 26-23 Distal femoral osteosarcoma with prominent bone formation extending into the soft tissues. The periosteum, which has been lifted, has laid down a proximal triangular shell of reactive bone known as a Codman triangle *(arrow)*.