

Osteosarcoma

Lester D.R. Thompson, MD

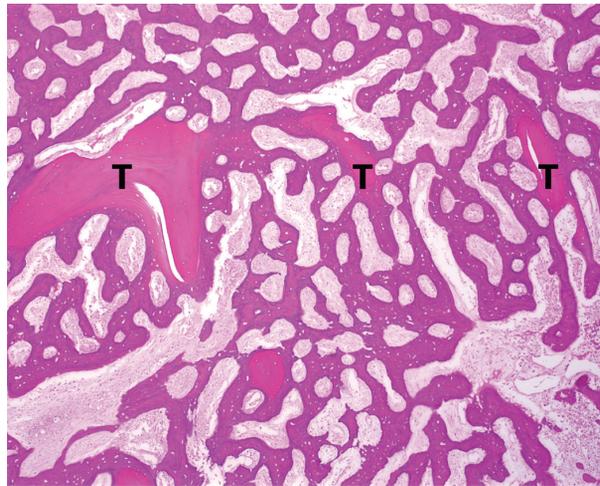


Figure 1. A low-power view of a conventional (intramedullary) osteosarcoma demonstrates islands of osseous matrix infiltrating through the trabecular (T) bone. The osseous matrix is formed by the malignant mesenchymal cells in the surrounding stroma.

Osteosarcoma is a mesenchymal malignancy in which the neoplastic cells synthesize and secrete the organic components of bone matrix. While it is the most common primary tumor of bone, it is very uncommon overall.

Osteosarcoma of the gnathic bones represents 6 to 8% of all osteosarcomas. Gnathic osteosarcomas usually present in patients in their mid-30s, which is more than a decade later than the peak incidence of long-bone osteosarcomas. This tumor affects the mandible and the maxilla differently, with mandibular tumors tending to arise from the body of the mandible while maxillary tumors arise from the alveolar ridge and sinus. The known etiologic factors include antecedent radiation exposure and Paget disease of bone.

Swelling and pain are the most common findings at presentation; teeth loosening, paresthesia, and bleeding may also be seen. Imaging studies are requisite for the diagnosis, as the destructive findings (sclerotic

and/or lytic) and soft-tissue extension help determine the diagnosis and operative planning. Most of these tumors are intramedullary; only a few cases of surface tumors have been described.

The treatment of choice is radical surgery, with or without adjuvant chemotherapy or radiation therapy. Treatment outcomes are similar to those of patients with long-bone osteosarcomas.

Macroscopically, gnathic osteosarcomas are gritty and tan-white, and depending on the matrix mineralization, they may exhibit a marble-like cut surface. Cartilaginous nodules (pale, blue-gray, and glistening) may be present. Histologically, osteosarcomas display mesenchymal cells that contain spindle-shaped to oval nuclei and indistinct cell membranes. Depending on the type and grade of a particular tumor, the cells may exhibit pleomorphism, a high nucleus-to-cytoplasm ratio, hyperchromatism, and abnormal mitoses. Bone matrix is the hallmark of osteosarcoma, but sometimes

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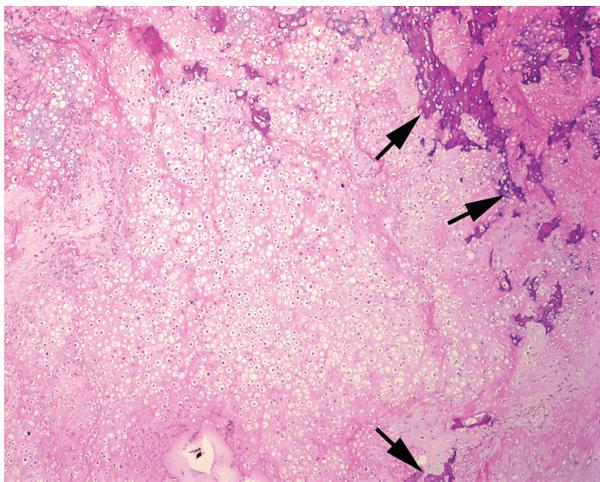


Figure 2. In this low-power photomicrograph of a chondroblastic osteosarcoma, most of the field demonstrates an atypical and malignant cartilaginous matrix, identifiable by the pale blue-gray color, with an admixed atypical osseous matrix (arrows).

the osseous matrix is relatively scant (figure 1).

One of the most common subtypes of gnathic osteosarcoma is chondroblastic osteosarcoma, which is made up of malignant, osteoid-producing cells with admixed islands and lobules of malignant cartilaginous or chondrosarcomatous tissue (figure 2). If the cartilage predominates, the tumor may be misclassified as a chondrosarcoma.

Suggested reading

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They are made up of lamellar bone, and there are minimal osteocytes surrounding the fibrovascular channels.³ In our case, CT of the temporal bone showed what appeared to be two osteomas. At surgery, the lateral tumor arose from the tympanosquamous junction of the right temporal bone; the interior tumor was not attached to the wall of the EAC but only to a part of the lateral tumor without adhesion. Since histopathology showed that the epithelium was overlying the interior tumor without being attached to the lateral tumor, we believe that what appeared to be two tumors was originally one large osteoma.

Acknowledgments

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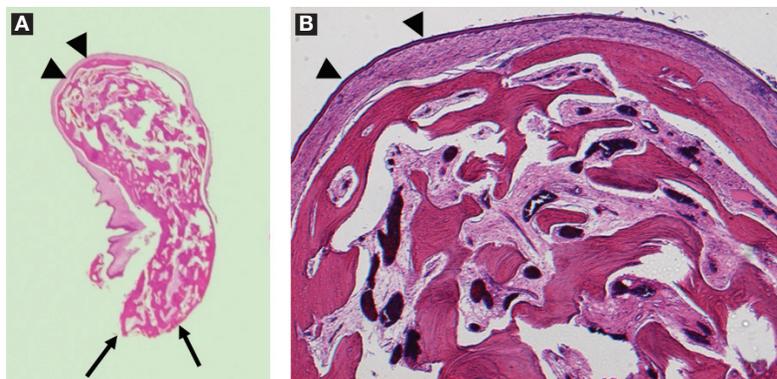


Figure 2. On histopathologic analysis, low- (A) and high-power (B) views show epithelium overlying the interior mass (arrowheads) without being attached to the lateral mass (arrows).

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