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Chondroblastoma of the Temporal Bone: CT and MR Appearance

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Summary: The authors report a case of chondroblastoma in the unusual location of the temporal bone. CT findings do not differ dramatically from other reports: the lesion appeared as a soft-tissue density mass in the right temporal bone, with bony destruction and thinning of cortical margins. MR findings are more rare: on coronal T1-weighted images the lesion appeared as a mass, isointense to gray matter, centered in the right petrous bone; on axial T2-weighted images, as a mixed-intensity signal mass. They conclude that MR is an accurate indicator of the location and extension of the tumor, but that CT gives more specific information regarding bone involvement.

Index terms: Chondroma; Temporal bone, neoplasms

We describe a patient with chondroblastoma of the temporal bone, an unusual location for this kind of tumor. Only 11 cases of temporal bone chondroblastoma have been reported, to our knowledge; of them, only two cases were studied with computed tomography (CT) and none with magnetic resonance (MR).

Case Report

A 58-year-old woman presented with a 2-month history of progressive right facial nerve palsy and headache. Neurologic examination revealed complete right facial palsy. The hearing test showed a marked conductive hearing loss. No other abnormalities were detected on physical examination. Laboratory studies demonstrated an elevated erythrocyte sedimentation rate. A CT scan of the head revealed a soft-tissue density mass in the right temporal bone that showed diffuse enhancement after contrast injection (Figs. 1A and 1B). There was marked bony destruction and thinning of cortical margins (Fig. 1C). Coronal T1-weighted MR images showed a mass, isointense to gray matter, centered in the right petrous bone (Fig. 1D). On axial T2-weighted images, the lesion appeared as a mixed-intensity signal mass (Fig. 1E).

At operation, a soft, brownish tumor was found in the right petrous pyramid. The tumor extended upwards into the middle cranial fossa and reached the cerebellopontine angle medially through the internal auditory meatus. Microscopic examination revealed a tumor composed of polygonal cells (chondroblasts) with scattered multinucleated giant cells, small foci of calcification with areas of chondroid matrix, and highly vascular fibrous tissue. All these findings were consistent with chondroblastoma.

Discussion

Chondroblastoma is an uncommon benign tumor that arises most often in the epiphyses of long bones. It is found primarily in adolescents and young adults, although occasionally it can be found in later adulthood and even in old age (1–5). Chondroblastoma arising from the temporal bone is extremely rare: our search of the literature disclosed only 11 cases (6). Temporal bone chondroblastomas occur in an older age group than do long bone lesions; this difference is its most characteristic feature (1, 2). Our findings of the CT appearance of a soft-tissue density mass with bone erosion and enhancement after contrast administration agree with other reports (6). Spotty calcifications in the central portion of the tumor detected by CT have also been reported (6). We did not detect calcifications on the CT scan, probably because of their small size.

The MR appearance of temporal bone chondroblastoma does not seem to have been described in the published literature. In our case, MR disclosed a mass isointense to gray matter on T1-weighted images, which showed heterogeneous signal on T2-weighted sequences. This heterogeneous signal intensity on MR is probably related to two factors: the highly vascular fibrous stroma and the intense cellularity. The small foci of chondroid matrix and calcified nodules interspersed among chondroblasts and giant cells are probably less relevant in the generation of the MR signal.

The differential diagnosis of expansive lesions arising from the temporal bone should include neurinomas of the fifth and seventh cranial
Fig. 1. A, Precontrast scan shows a soft-tissue density mass in the right petrous bone. B, Contrast-enhanced CT scan shows marked enhancement of the lesion. C, Bone window CT reveals an expansive tumor in the right petrous pyramid, with bone destruction (arrows). D, Coronal T1-weighted (560/20/2) MR section shows a mass isointense to gray matter in the right petrous bone (arrows). The tumor extends upwards into the middle fossa and causes compression of the temporal lobe. E, Axial T2-weighted (2040/100/2) MR image shows mixed intensity signal of the tumor, with spotty areas of high intensity (arrows).

nerves, as well as benign osseous tumors (osteoma, chondroma, giant cell tumors, aneurysmal bone cysts, and fibrous dysplasia) and metastasis. Neurinomas in the petrous bone usually present as smooth rounded erosions, whereas benign osteomas are sharply defined lesions harboring cortical bone-like density on CT and lack of signal on MR. Giant cell tumors and aneurysmal bone cysts are rarely detected in the temporal bone, although a few cases of giant cell tumor of the petrous bone have been described. Aneurysmal bone cysts are more frequently encountered in young people; the temporal fossa is the usual location (7, 8).

In conclusion, MR can accurately depict the location and extension of the tumor; however, accurate identification of the shape and edges of bone structures as well as subtle calcifications are difficult with MR. Bone involvement is shown to a better advantage with CT. As these features can assist in the differential diagnosis, CT, in our opinion, offers some advantage in revealing more specific data.

References