

# Epithelioid Osteoblastoma Combined with Aneurysmal Bone Cyst Originating from the Right Temporal Bone and the Greater Wing of the Sphenoid Bone

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A 16-year-old girl was presented to our hospital for neurosurgical treatment because of headache and dizziness. These symptoms developed spontaneously and worsened within 2 weeks without prior trauma. Physical examination and the patient's medical history were otherwise unremarkable. The initial laboratory testing was normal. Further diagnostic workup revealed that on plain computed tomography (CT), irregular shadows of cystic-solid mixed density were seen at the base of the right middle cranial fossa and the right temporal region, with many liquid planes and scattered punctate calcifications visible within them. The tumor's boundary was clear, and the maximum cross-sectional area was about 5.4 x 4.4 x 4.0 cm. The lesion had a significant space-occupying effect.

The right temporal lobe and brainstem were compressed, and a large edema shadow was seen in the right temporal lobe, with the brain midline slightly shifted to the left. The surrounding bone of the skull base showed expansive growth, and some bone continuity was interrupted. On T1WI, a circular cystic-solid mixed-signal mass was seen at the base of the right middle cranial fossa and the right temporal region, with a significant space-occupying effect. The tumor edge was smooth and showed a high signal, with hemorrhage, multiple liquid planes, and scattered dotted high signals. On T2WI FLAIR, the tumor showed honeycomb mixed-signal shadows with clear boundaries. Multiple patchy high-signal shadows were seen within the lesion, with irregular high-signal edema zones surrounding them. The enhancement scan revealed significant enhancement of the capsule wall and solid portion. The right temporal lobe, basal ganglia, and brainstem were significantly compressed, and edema was visible in the surrounding brain tissue. The brain midline shifted to the left. MRS: NAA was not shown. CT and magnetic resonance imaging (MRI) suggested that the tumor

originated from the right temporal bone and the greater wing of the sphenoid bone and grew intracranially. The tumor was considered a chondroblastoma combined with aneurysmal bone cysts, a giant cell tumor of the bone, or osteosarcoma (Figures 1-5).<sup>1,2,3</sup>

Subsequently, the patient underwent radical surgery at our hospital. Postoperative pathological section: Right sphenoid wing, intermediate-type osteogenic tumor; epithelioid osteoblastoma combined with aneurysmal bone cyst should be considered first.

**Immunohistochemistry:** CD34 and CD31 vascular endothelial cells+, GFAP-, NSE-, CD68 histiocytes+, EMA-, SMA vascular wall+, SATB2 interstitial cells+, Ki-67 low proliferation, A-inhibin-, S-100-, Syn, STAT6, and P63 histiocytes -/+ (Figure 6).

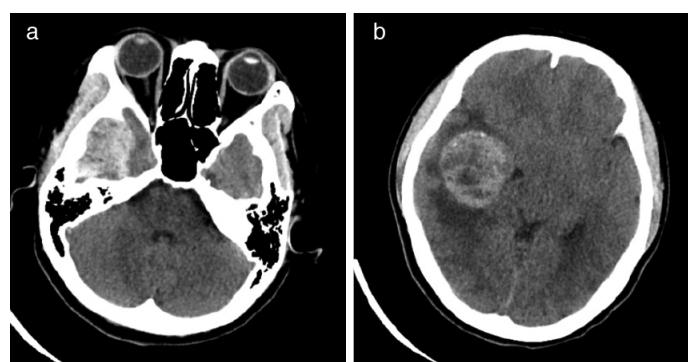


FIG. 1. CT revealed circular mixed-density shadows in the right middle cranial fossa and temporal region (1a), with an "8"-shaped lesion surrounded by spotted high-density and massive edema (1a/1b, Axial CT; 1c, coronal CT).

CT, computed tomography.



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FIG. 2. CT bone window revealing hyperosteogeny and sclerosis  
CT, computed tomography.

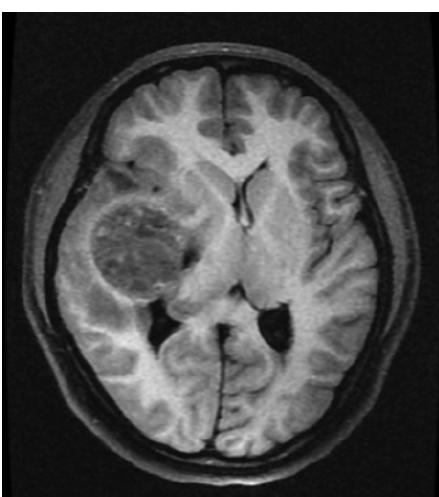


FIG. 3. T1WI revealing a mass with a low-signal shadow, and the midline shifted to the left.

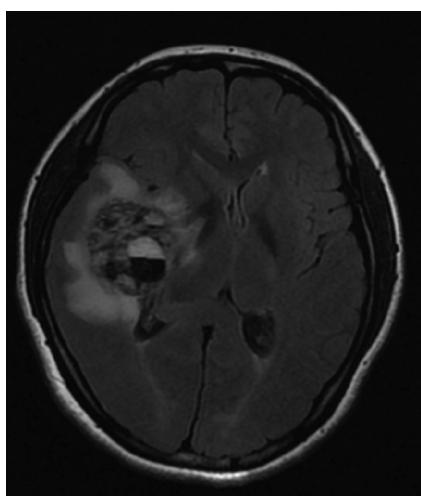


FIG. 4. T2WI revealing a cystic-solid mass with surrounding edema.

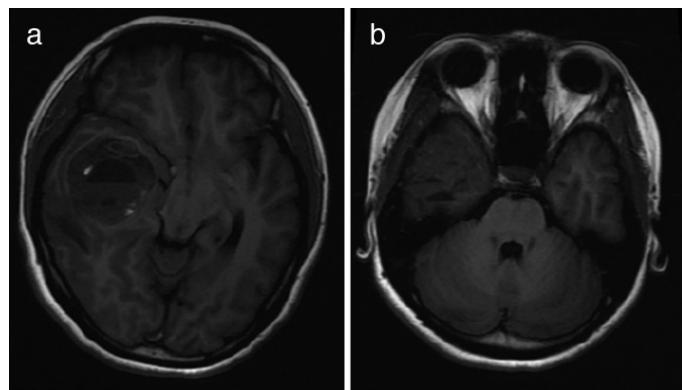
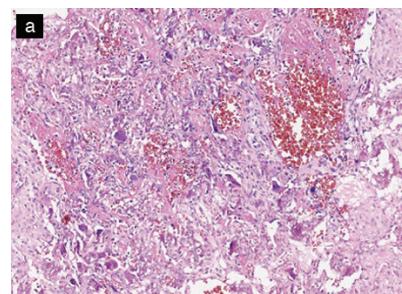
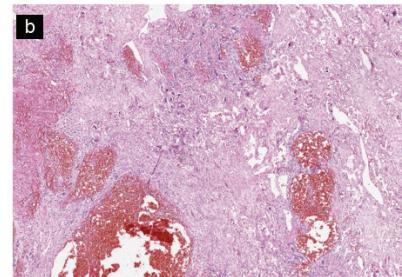


FIG. 5. T1WI enhancement revealing a liquid plane with punctate high-signal intensity within the mass and involving the right greater wing of the sphenoid bone (5a). The solid part of the tumor was lightly enhanced during the arterial phase, but the area of cystoid variation and necrosis was not enhanced in the MR coronal view (5b).

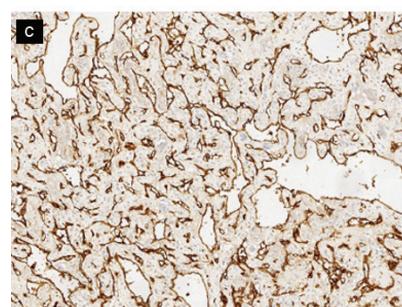
MR, magnetic resonance



6a HE 100X



6b HE 40X



6c CD34 40X

FIG. 6. The tumor was considered an epithelioid osteoblastoma combined with an aneurysmal bone cyst after routine pathology (6a, 6b) and immunohistochemistry (6c).

The tumor was finally considered an epithelioid osteoblastoma combined with an aneurysmal bone cyst originating from the right temporal bone and sphenoid greater wing, as suggested in the preoperative examination.<sup>4,5</sup>

**Follow-up:** One year postoperatively, MRI revealed a patchy high-signal area in the diffusion-weighted imaging sequence and a patchy low-signal area in the ADC sequence from the right temporal region, suggesting a tumor recurrence, but the patient opted for conservative treatment and follow-up (Figure 7).

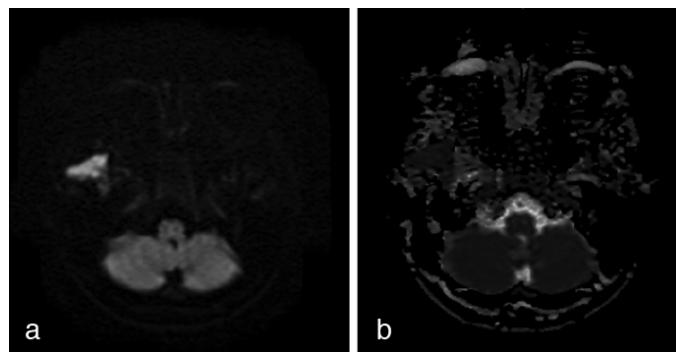


FIG. 7. Follow-up: One year postoperatively, MRI revealed a patchy high-signal area in the DWI sequence (7a) and a patchy low-signal area in the ADC sequence (7b) from the right temporal region, indicating tumor recurrence.

*MRI, magnetic resonance imaging; DWI, diffusion-weighted imaging*

**Ethics Committee Approval:** This study was approved by the Ethics Committee of Xiangyang NO.1 People's Hospital, affiliated to Hubei University of Medicine (no.: 20221825a).

**Informed Consent:** Informed consent was obtained from the patient's parents.

**Data Sharing Statement:** The data that support the findings of this study are available from the corresponding author upon reasonable request.

**Author Contributions:** Concept- P.A., P.G., G.F.; Design- P.A., P.G., J.L.; Supervision- J.L., G.F.; Fundings- G.F.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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