

Case Report

Benign Osteoblastoma Located in the Parietal Bone

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Benign osteoblastoma is an uncommon primary bone tumor, extremely rare in calvarium. We present a case of a 25-year-old female with an osteoblastoma of parietal bone which was totally resected. The authors discussed the clinical presentation, radiographic finding, differential diagnosis and management of the benign calvarial osteoblastoma with a review of the literature.

KEY WORDS : Osteoblastoma · Parietal bone.

INTRODUCTION

Benign osteoblastoma is uncommon, which accounts for approximately 1% of all primary bone tumors. Osteoblastoma usually affects the vertebral column and long tubular bones of the lower extremities¹²⁾. This tumor can occur rarely in skull, mostly facial bone and mandible, but is rarely seen in the calvarium. We report a rare case of benign osteoblastoma arising in the parietal bone with literature review.

CASE REPORT

A 25-year-old female presented with a palpable mass on right parietal region. She had no significant history of trauma or medical illness. She detected a small hard mass on right parietal area near midline at childhood and initially visited hospital at 12 years of age. Computed tomographic (CT) scans showed 2.8×1.2 cm sized subperiosteal ossifying mass at that time. She had no headache, but complained of slowly growing mass. Physical examination revealed mild dull tenderness on the mass, otherwise, no abnormality was found neurologically and there were abnormal laboratory findings.

Plain skull X-ray series showed a focal bulging mass at right parietal bone, without evidence of significant destruction or

periosteal reaction (Fig. 1). CT scans showed a focal bulging mass at right parietal bone with ground glass opacity of widened diploic space, but no evidence of brain invasion (Fig. 2). According to CT scans, the lesion measured $3.6 \times 4.3 \times 2$ cm in size. On magnetic resonance imaging (MRI), slightly inhomogeneous low signal intensity was noted on both T1- and T2-weighted images. T1-weighted images obtained after intravenous administration of gadolinium-

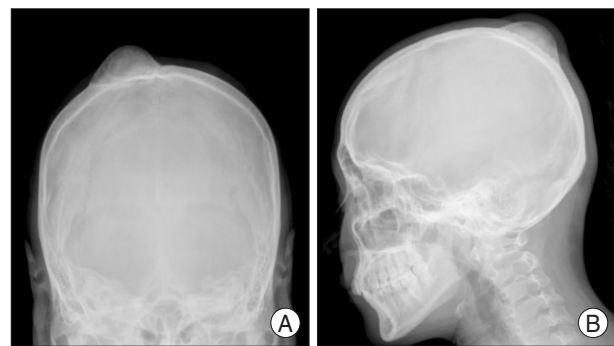


Fig. 1. Plain radiography showing a focal bulging mass at right parietal bone. A : Anteroposterior view. B : Lateral view.

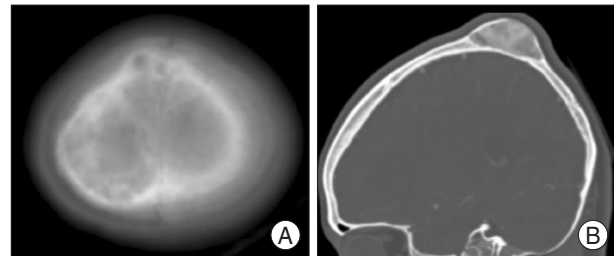


Fig. 2. Computed tomographic scan demonstrating a focal bulging mass of right parietal bone with ground glass opacity of widened diploic space. A : Axial view. B : Sagittal view.

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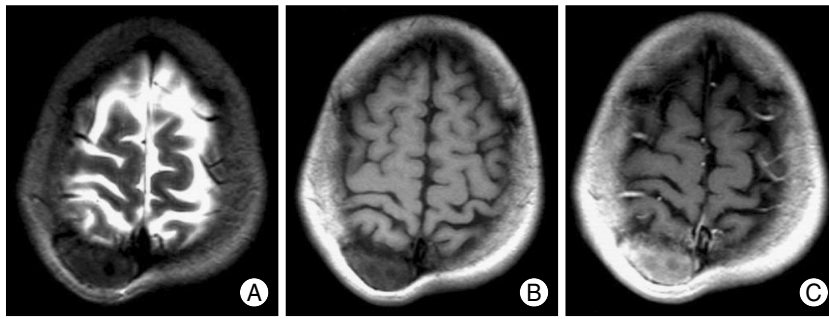


Fig. 3. A : Axial T2-weighted images show slightly inhomogeneous low signal at the lesion. B : T1-weighted images also show slightly inhomogeneous low signal at the lesion. C : T1-weighted images obtained after intravenous administration Gd-DTPA show inhomogeneous enhancement in the lesion.

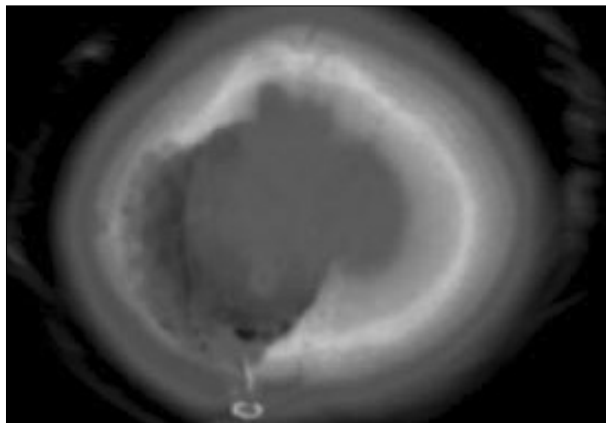


Fig. 4. Postoperative CT scans showing right parietal craniectomy with cranioplasty state.

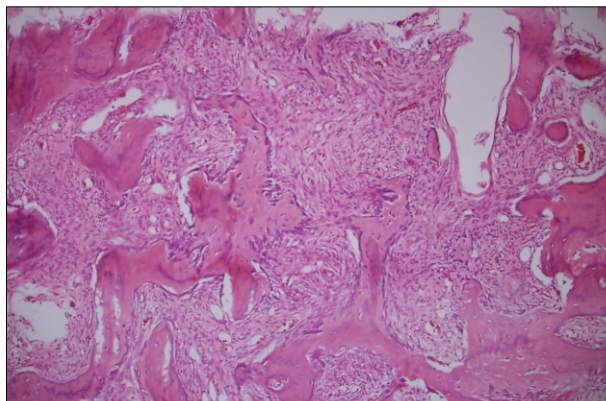


Fig. 5. Photomicrographs showing the tumor is composed of haphazard proliferation of interlacing trabeculae with osteoblastic rimming in fibrovascular stroma. (H & E stain, $\times 100$)

labeled diethylene triamine pentaacetate (Gd-DTPA) showed inhomogeneous enhancement in the lesion (Fig. 3).

At surgery, linear skin incision was made along the long axis of mass. Right parietal craniotomy was performed and the bone tumor was removed totally. There was no dural and brain invasion by tumor. On postoperative CT scans, total removal of bone tumor was confirmed (Fig. 4).

Postoperative histologic examination revealed that the tumor was composed of haphazard proliferation of interlac-

ing trabeculae with osteoblastic rimming in fibrovascular stroma (Fig. 5). The histologic diagnosis was osteoblastoma with maturation. The patient was discharged without adverse event and there is no sign of recurrence for 2 years after surgery.

DISCUSSION

Benign osteoblastoma was initially reported by Jaffe and Mayer in 1932 under various names such as 'osteogenic fibroma of bone' and 'giant osteoid osteoma'¹⁰. The current term was first described in 1956 by Lichtenstein and Jaffe^{9,13}. It is a relatively uncommon lesion that represents about 1% of benign bone tumors which usually affect the vertebral column and long tubular bones of the lower extremities¹¹. Approximately 15% of osteoblastoma occur in the skull and facial bones, but its occurrence in the calvarium is only about 3%¹⁴. Although this tumor rarely develops in the calvarium, it usually presents in the temporal bone and followed by the frontal bone. Its occurrence in the parietal bone is extremely rare. To our knowledge, this case is the seventh reported case of benign osteoblastoma confirmed to the parietal bone. Table 1 shows seven cases of benign osteoblastoma located in the parietal bone including our case^{2,5,6,15,16,20}.

In the study of Tawil et al.¹⁹ on 2008, patients of benign osteoblastoma in calvaria ranged in age from 4.5 months to 76 years, with a mean age of 21 years and a peak incidence in the first three decades of life. Females were slightly more frequently affected than males in calvaria in compared to male preference of osteoblastoma in usual site. The common presenting symptom of the calvarial tumors was painful swelling. Hearing disturbance, headache, visual disturbance and facial nerve palsy have been also reported¹⁹.

The radiographic findings of the tumor was that of an intramedullary, expansile, usually well-demarcated, lytic lesion averaging 4 cm in diameter (range 2-10 cm)¹⁹. CT scans usually demonstrated a bony destruction and parts of calcifications with variable patterns of contrast enhancement. The MRI findings are characterized by hypo- or isointense mass on T1-weighted images and hypointense mass on T2-weighted images with homogeneous or heterogeneous enhancement after the administration of Gd-DTPA¹⁸.

The differential diagnosis with the osteoid osteoma is sometimes very difficult. However, benign osteoblastoma is differentiated from osteoid osteoma on the basis of size : osteoid osteomas are typically static lesions of 1.5 cm in diameter or less whereas osteoblastomas are continuously

Table 1. Seven cases of benign osteoblastoma in the parietal bone

| Author | Age/Sex | Symptom | Size (cm) | Management | Outcome |
|--------------------------------|---------|---|-----------|---------------------------------|---------|
| Cervoni et al. ⁵⁾ | 57/M | Painful lump | -3 cm | TR | R (-) |
| Martínez et al. ¹⁶⁾ | 5/F | Non-tender lump | 2 cm | TR | R (-) |
| Choudhury et al. ⁶⁾ | 5/F | Subcutaneous mass | U | TR | U |
| Aziz et al. ²⁾ | 19/M | Swelling | 4 cm | TR+CTx | R (-) |
| Martin-Ferrer ¹⁵⁾ | 19/F | Nocturnal headache | 2 cm | TR Craniectomy Meningiectomy | R (-) |
| Tsugu et al. ²⁰⁾ | 9/M | Persistent parietal bulge after trauma | U | TR | R (-) |
| Current case | 25/F | Subcutaneous mass | 4 cm | TR | R (-) |

CTx : chemotherapy, TR : total resection, R : recurrence, U : unknown

growing lesions that are often more than 1.5 cm in diameter. Osteoblastoma often is more vascular than osteoid osteoma and is shown radiographically to expand more aggressively through cortical bone. Osteoid osteoma is surrounded by more sclerotic bone and thin central nidus. Osteoid osteoma can also be more painful than osteoblastoma^{7,17)}. Osteoblastoma must be differentiated from osteosarcoma. Osteosarcomas show more aggressive and destructive features; high mitotic activity, atypical mitotic figures, lace-like osteoid deposition, and destructive permeation of surrounding tissue^{17,19)}.

Although osteoblastoma is regarded as benign, several cases of invasion, local recurrence and malignant transformation have been reported^{1,8,14)}. Because the recurrence rate after incomplete resection appears to be as high as 16-20%¹⁴⁾, total resection of tumor is recommended whenever possible. There is no role for adjuvant radiotherapy or chemotherapy for osteoblastoma, except in recurrent or surgically unresectable cases^{3,4)}.

CONCLUSION

In conclusion, benign osteoblastoma of parietal bone is very rare, but should be considered as a differential diagnosis of calvarial bone mass. Total surgical resection is the treatment of choice to prevent recurrence and malignant transformation.

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