

## 후두골에 발생한 거대세포종

- 증례 보고 -

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### Giant Cell Tumor of the Occipital Bone

- Case Report -

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#### ABSTRACT

Giant cell tumors of the skull are very rare. They seldom involve the skull and more often tend to involve the temporal and sphenoid bone. We present here the case of a 25 year-old female with giant cell tumor of the occipital bone who visited the hospital with headache and posterior neck pain. Magnetic resonance(MR) imaging revealed a well defined extra-axial mass of 3×3cm in the posterior fossa with changes of the overlying calvarium. The lesion showed isosignal intensity on the T2 weighted image and homogeneous strong enhancement on the T1 enhanced image. The patient underwent total resection of the lesion and giant cell tumor was made as a final diagnosis. A brief review of the literature is also presented.

**KEY WORDS :** Giant cell tumor · Occipital bone · Skull neoplasms.

#### Introduction

Giant cell tumors represent about 5% of bony tumors, with 75 to 90% of them involving the epiphyseal ends of long bones.<sup>2,5)</sup> They seldom involve the cranium and tend to involve the temporal and sphenoid bones.<sup>4,9)</sup> They usually occur in the third and fourth decades of life. We present here a 25 year-old female with giant cell tumor of the occipital bone.

#### Case Report

A 25-year-old female patient admitted to our clinic pre-

senting with complaints of headache and posterior neck pain. On the general physical examination, no mass was palpable on the scalp. There was no neurological deficit and she did not have a history of trauma. Plain radiographic films of the skull showed a round large osteolytic and sclerotic lesion on the occipital bone (Fig. 1). Magnetic resonance MR imaging revealed a well defined extra-axial mass of 3 × 3cm in the posterior fossa with changes of overlying calvarium. It showed isosignal intensity on the T2 weighted image and homogeneous strong enhancement on the Gd-DTPA enhanced image (Fig. 2). On her angiography study, the lesion was moderately vascular and predominantly supplied by the bilateral occipital arteries (Fig. 3). The arteries supplying the lesion were successfully embolized with polyvinyl alcohol material 3 days before the operation. Our first impression, based on the findings of brain MR imaging and cerebral angiography, was that she had a posterior fossa meningioma. The midline suboccipital craniotomy was carried out and the tumor was totally removed.

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It originated from the occipital bone and extended through the dura mater. It was hard in consistency and yellowish in color. It was located both intradurally and extradurally, mainly in the epidural space, and a small portion of tumor had penetrated through the dura mater. There was no evidence of invasion of brain parenchyma. The overlying bone was resected and cranioplasty with hydroxyapatite was done.

Histopathological examination showed an expansile tumor with a focal infiltrative pattern on a low power view. On the high power view, it showed the classic histologic findings of giant cell tumor of bone, osteoclastic giant cells and spindle

shaped stromal cells (Fig. 4).

The postoperative course was uneventful. The patient's headache and posterior neck pain have improved.

## Discussion

Giant cell tumors of bone (osteoclastoma) originate from the connective tissue within the bone marrow, which are rare tumors representing about 5% of all bony tumors. Approximately 75 to 90% of these tumors involve the epiphyseal ends of the long bones. The remaining 10 to 25% involve the sacrum, patella, bones of the hand, and the vertebra.<sup>2,5,7)</sup> In very rare instance, giant cell tumors arise in skull. Within the skull, giant cell tumors most frequently occur in the sphenoid and temporal bones. They rarely involve the ethmoid, frontal, petrous or occipital bones.<sup>4,8)</sup> Embryologically, the sphenoid and temporal bones are generated through endochondral bone formation, except for the greater wing and pterygoid processes of the sphenoid bones. In contrast, the other skull bones are produced by intramembranous bone formation. It has been suggested that this difference in genesis may be related to the relative absence of these tumors in other calvarial bones.<sup>9)</sup>

Giant cell tumor of the skull usually occur in the third and fourth decades of life.<sup>3)</sup> They are rare in persons under the age of 15 and over 40, and these tumors have a slight female predominance.<sup>4,8)</sup> The clinical presentation usually depends upon the site of origin. The symptoms are pain and swelling in the region of the affected bone, limitation of motion of the adjacent joint and weakness of the involved extremity.<sup>4)</sup> Tumors arising from the sphenoid bone typically cause headache, ophthalmoparesis, trigeminal hyperesthesia and loss of vision.<sup>3,8,10)</sup> Temporal bone tumor usually manifests as pain be-



Fig. 1. Town's view of the skull shows a round osteolytic lesion of occipital bone.

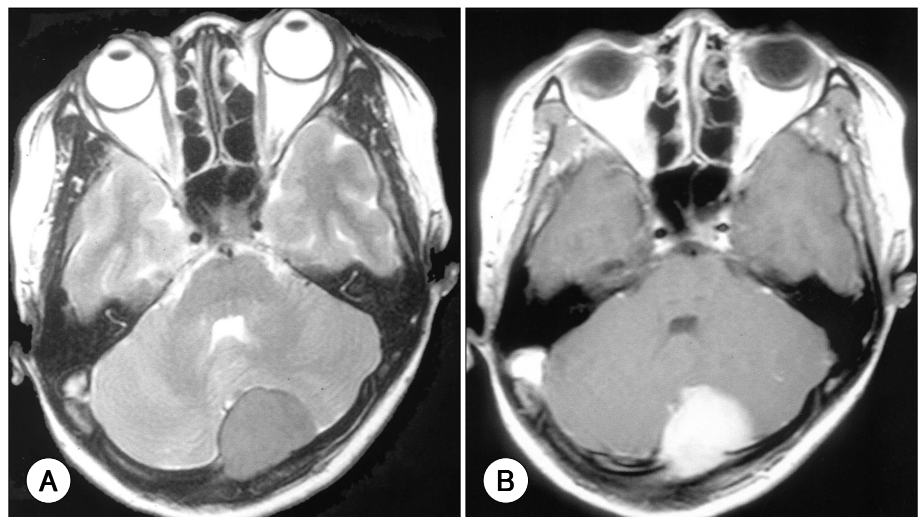
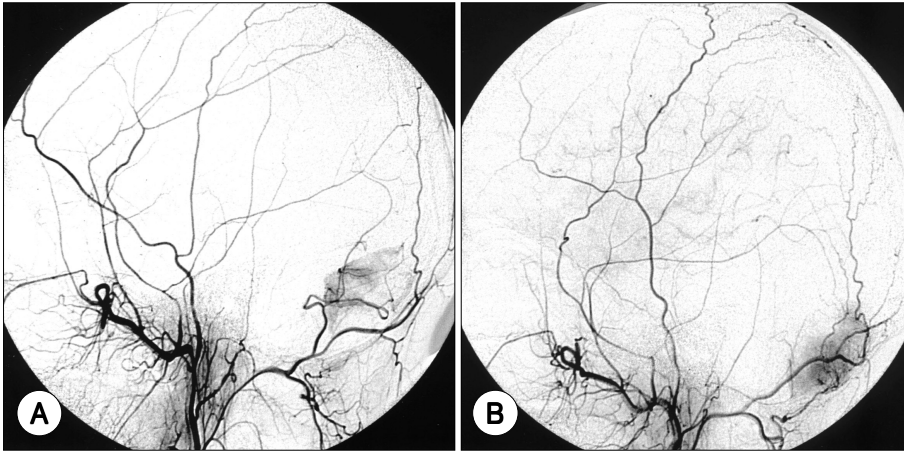
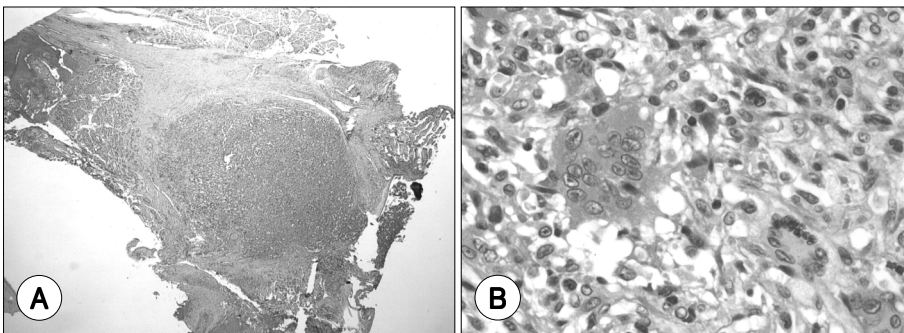


Fig. 2. Magnetic resonance (MR) imaging revealing a well defined extra-axial mass in the posterior fossa. A : It shows isosignal density on T2 weighted MR image. B : Strong homogeneous enhancement can be observed on the T1 enhanced image.



**Fig. 3.** Cerebral angiography showing that the tumor is supplied by bilateral occipital arteries. Right external carotid artery lateral(A), left external carotid artery lateral(B).



**Fig. 4.** Histopathology of the tumor. A : Low power view showing expansile tumor with a focal infiltrative pattern(H & E,  $\times 100$ ). B : Tumor showing the classic histologic finding of giant cell tumor of bone, osteoclastic giant cells and spindle shaped stromal cells(H & E,  $\times 400$ ).

hind the ear on the affected side, vertigo, dizziness, deafness and facial weakness.<sup>3)</sup>

Histopathologically, giant cell tumors are characterized by a vascular stroma with spindle-shaped or oval stroma cells and occasional multinucleated giant cells. Mitotic figures are common, but osteoid formation is rare.<sup>2,4,5,7,8)</sup>

The radiological appearance of giant cell tumor is of an expansive or lytic lesion of the bone with areas of cortical perforation.<sup>2,4,7,8)</sup> Computerized tomography usually shows an expanding lesion with homogenous contrast enhancement.<sup>2,4,5,7,9)</sup> MR imaging usually shows a homogenous mass displacing the adjacent arteries and homogenous enhancement after injection of gadolinium DTPA.<sup>9)</sup> MR imaging is a very useful tool to localize and evaluate the extent of giant cell tumors as well as its relation with surrounding major vessels.<sup>10)</sup>

The radiological appearance may mimic that of malignant tumors. Radiological differential diagnosis includes aneurysmal bone cyst, chondroblastoma, dermoid cyst, chondrosarcoma, eosinophilic granuloma, osteolytic metastasis and giant cell granuloma.<sup>1,6)</sup>

Total surgical resection is the treatment of choice of giant cell tumors in all operable lesions.<sup>2,5,6,8)</sup> Unfortunately, total

resection of tumor is rarely feasible when the tumor involves the skull base. The role of adjuvant radiation treatment remains controversial, because most benign giant cell tumors of bone are radioresistant, and they may undergo malignant transformation when irradiated.<sup>2,5,7-9)</sup> Local failure of radiation therapy has been reported to be as high as 40 to 60%, and rate of malignant transformation after radiation therapy has been reported from 7 to 25%.<sup>2,7)</sup> On the other hand, some authors recommend radiation treatment for the inoperable site and not for radically operated cases.<sup>1)</sup> In our case, adjuvant radiation treatment was not done because we believed that the tumor had been totally resected. Recurrences are best treated with repeated local resection.

### Conclusion

Giant cell tumor of the skull is very rare and tends to involve the sphenoid and temporal bone, and involvement with the occipital bone is extremely rare. The MR imaging and angiography findings may mimic the extra-axial tumors such as meningioma, so the careful examination of plain film of the skull and computerized tomography must be carried out to establish the diagnosis. Intraoperative pathologic con-

firmation may be helpful since the complete resection of giant cell tumor is the choice of the treatment.

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### 국문 초록

중심 단어 : 3 × 3cm 가 . 25

T1 T2

1