

Giant Cell Tumor of the Temporal Bone in an Old Patient

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We report a case of a 67-year-old woman with giant cell tumor of the temporal bone. A 67-year-old woman presented with localized tenderness, swelling, sensory dysesthesia, dizziness, and headache over the left temporal bone. She was neurologically intact except left hearing impairment, with a nonmobile, tender, palpable mass over the left temporal area. A brain computed tomography(CT) scans showed a relatively well defined heterogenous soft tissue mass with multiple intratumoral cyst and radiolucent, osteolytic lesions involving the left temporal bone. The patient underwent a left frontotemporal craniotomy and zygoma osteotomy with total mass removal. Permanent histopathologic sections revealed a giant cell tumor. She remains well clinically and without tumor recurrence at 2 years after total resection.

KEY WORDS : Giant cell tumor · Temporal bone · Old patient.

Introduction

Giant cell tumors are benign lesions that represent only 1.4 to 1.8% found in the skull. In the cranium, the sphenoid bone is the most common site, the temporal bone is rare¹¹. They are very rare in especially patients older than 60years¹⁸. Radical surgical resection is the treatment of choice^{1,2}. Adjuvant radiotherapy is controversial^{1,11,13,15}.

We present a case of the giant cell tumor of the temporal bone in an old patient.

Case Report

A 67-year-old woman presented with dizziness, left hearing loss, chewing difficulty, localized tenderness, swelling over the left temporal bone, and dysesthesia on left temporal swelling area from 7~8months ago. She had no history of trauma, medication, or prior surgery. Audiogram revealed 35dB on left hearing. The facial muscle weakness was not found.

For laboratory, full blood count, liver function test, electrolytes, serum calcium, serum alkaline phosphatase, and thyroid function test were within normal limits.

A computed tomography(CT) scans showed a radiolucent, osteolytic, and bony expansion involving zygomatic root and

squamous portion in the left temporal bone and bony invasion to left semicircular canal(Fig. 1).

The mass extended into the left temporal lobe with no apparent mass effect or edema. The mass demonstrated intense contrast enhancement. Magnetic resonance(MR) images demonstrated a well-demarcated, multilobulated mixed cystic mass with hemorrhagic components and fluid levels and showed contrast enhancement without dural and intracranial invasion(Fig. 2). Frozen biopsy was consistent with a giant cell tumor.

At surgery, a frontotemporal craniotomy with zygoma osteotomy and total mass removal performed. Ivory and violet colored, soft, and cystic mass showed in the operation finding. Dural invasion was not found.

On pathological examination, they revealed a giant cell tumor. It was composed of multiple multinucleated giant cell and short-

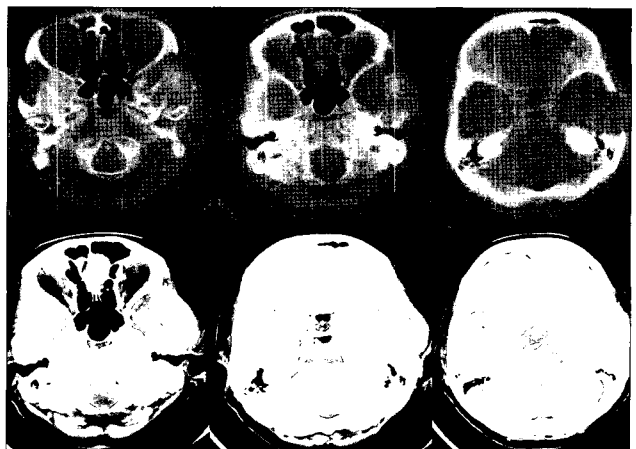


Fig. 1. Brain computed tomography(CT) scans before tumor operation CT scans show a radiolucent, expansile, and lytic lesion involving the temporal bone with intense enhancement.

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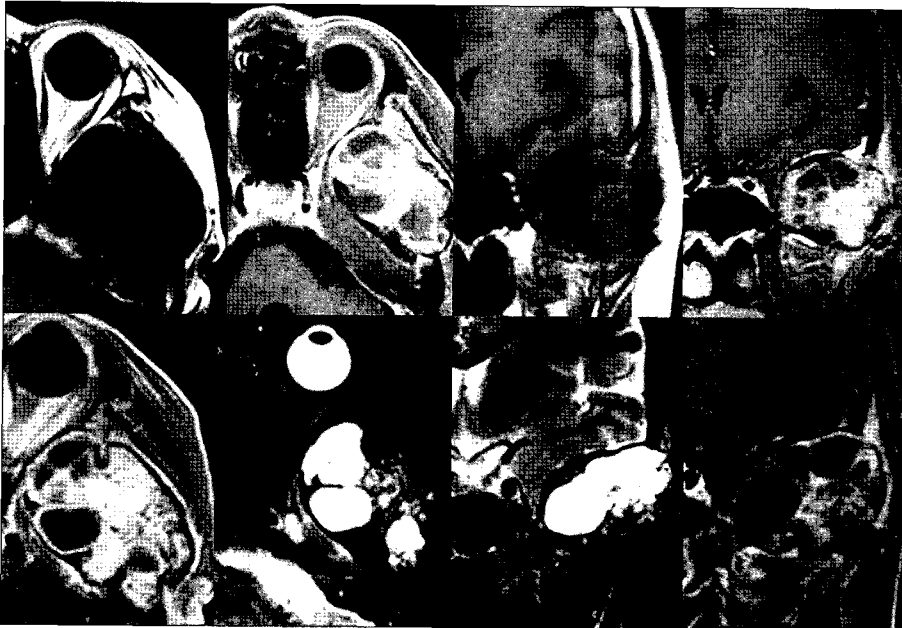


Fig. 2. Magnetic resonance images demonstrated a well-demarcated, multilobulated mixed cystic mass with hemorrhagic components and fluid levels and showed contrast enhancement without dural and intracranial invasion.

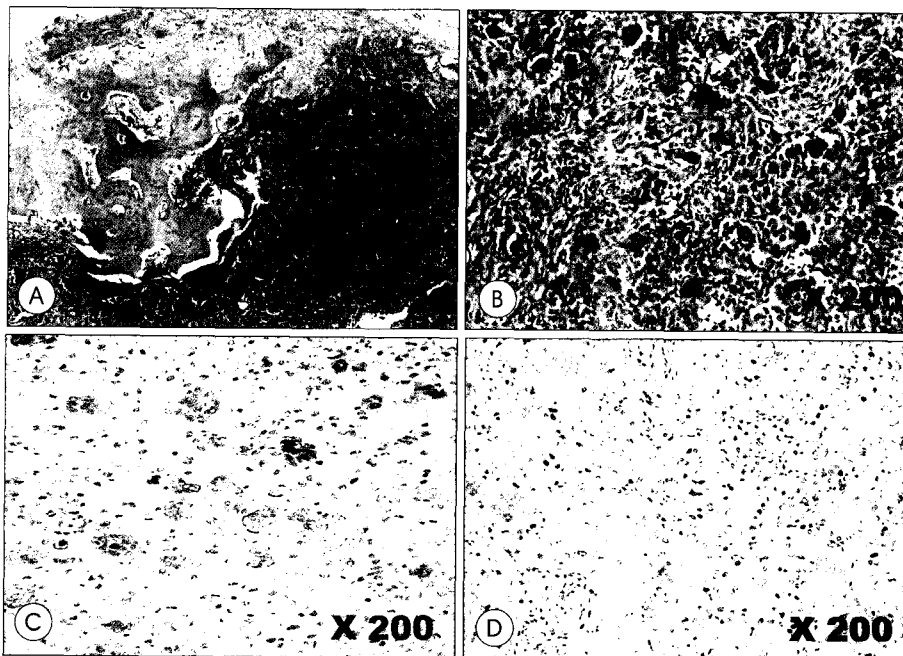


Fig. 3. A, B : Giant cell tumor of the temporal bone (H&E, original magnification X20, X200) The tumor demonstrate numerous giant cells dispersed in a predominantly spindled cell stroma. Also they show the infiltration of trabecular bone C : Immunostains for CD68 were positive in the giant cells, negative in the stromal cells. (CD68; macrophage marker, X200) D : A few of the stromal cells were positive for Ki-67, but the giant cells were negative.(Ki-67; cell proliferation index, Ki-67 labeling index : 10%, ×200).

spindle stromal cell. Immunostains for CD68(macrophage marker) were positive in the giant cells and negative in the stromal cells. A few of the stromal cells were positive for Ki-

67(cell proliferation marker, Ki-67 labeling index : 10%), but the giant cells were negative(Fig. 3). The postoperative course was uneventful, and no further treatment was given. She remains well clinically, and follow-up CT and MR images reveal no evidence of tumor recurrence for six months and two years after surgery(Fig. 4, 5).

Discussion

Giant cell tumors originate from the connective tissue within the bone marrow¹⁹. They are generally benign and locally aggressive lesions with the potential to malignant change^{14,21}. Also they represent about 5% of bony tumors, with 90% involving the ends of long bones and only 1.4 to 1.8% found in the skull⁷. In the skull base, the sphenoid bone is the most common site, followed by the nonsquamous portion of the temporal bone^{2,10,11,15,20,23,26}. Also rarely, they have been reported in the petrous and occipital bone¹⁶. These lesions generally present with pain and swelling^{12,23,25}. The temporal bone tumors typically cause pain behind the ear on the affected side, deafness and facial weakness^{19,24,26}.

The hearing loss is due to properties of these tumors to invade the infratemporal fossa and obstruct the eustachian tube^{9,26}. This tumors occur most commonly in the third or fourth decade of life. But they are very rare in younger than 20 years of age⁵ and older than 60 years of age¹⁸. They are slightly common in females^{2,8,9,19,20}.

Radiologically, they appears as radiolucent lesions without sclerotic change^{12,17}. A computed tomography(CT) scans show a radiolucent, osteolytic bony expansion and usually

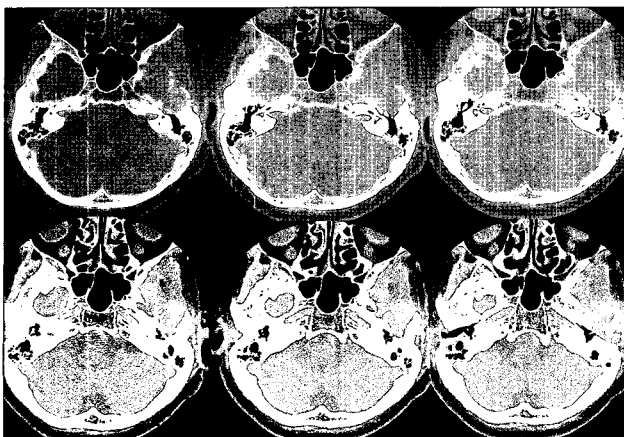


Fig. 4. Non-contrast computed tomography scans after tumor operation (6months later) They show the bony invasion of left semicircular canal.

reveals a tumor that is slightly increased in density before contrast administration, with intense and homogeneous enhancement after contrast administration²⁰. The radiological differential diagnosis includes aneurysmal bone cyst, chondroblastoma, dermoid cyst, eosinophilic granuloma, plasmacytoma, giant cell reparative granuloma, metastatic lesions, fibrous dysplasia, and brown tumor of hyperparathyroidism¹⁹. MR image typically reveals that the signal intensity is not increased on T2 WI, unlike the usual appearance of many other intracranial neoplasm²⁰.

Recent experiments have characterized these lesions as consisting of three cell types(osteoclast-like multinucleated giants cells, round mononuclear cells resembling monocytes and a spindle-shaped, fibroblast-like stromal cells²⁵). The stromal cell component may actually be of neoplastic origin, with the multinucleated giant cells being a reactive component^{19,25}). The giant cells, which resemble osteoclasts both morphologically and immunochemically, may arise from circulating mononuclear phagocytes, representing a reactive process rather than neoplasia^{1,13}.

Histologic differential diagnosis includes tumors in which giant cells may be found(osteogenic sarcoma, chondrosarcoma, malignant fibrous histiocytoma, chondromyxoid fibroma, and eosinophilic granuloma)²⁰.

Surgical resection is the treatment of the choice^{12,23}, and irradiation may predispose to malignant change¹³. Radiation therapy is restricted to surgically inaccessible and usually malignant lesions^{5,6,12,13,19,20}. The role of radiation therapy is controversial. Most benign giant cell tumors of bone are radioresistant, and they may undergo malignant degeneration when irradiated^{4,12,23}. On the other hand, Findlay et al. believe that carefully planned and delivered supervoltage irradiation is safe and effective⁹. By some authors, post-operative irradiation

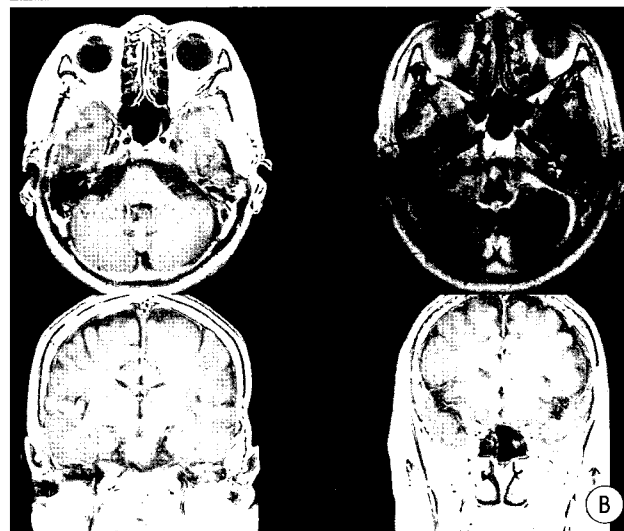
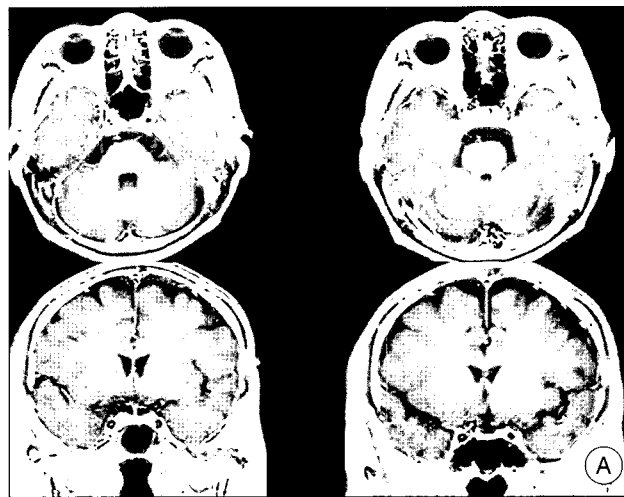


Fig. 5. Follow-up magnetic resonance(MR) images A(6months later after operation), B(2years later after operation) There was no recurrence in follow-up MR images for 2 years after operation.

has been reported to be effective in decreasing the recurrence of the tumor²². In radiated patients sarcomatous change occurred in 7% to 25% of recurrent tumor, compared to 3% of tumor recurrence in non-radiated patients^{9,24,26}.

Metastasis to the lung may be seen with an incidence ranging from 1 to 2%^{3,7,13,23}. Usually to lung, where some tumors may regress spontaneously¹³.

Rengachary, in his comments on this report, stated that malignant degeneration¹³. Malignancy develops in approximately 5 to 10% in cases^{14,18}. Even if resection is subtotal, recurrence rate is only 20%. And some authors reported as high as 40 to 60%²¹. A literature reviewed by Henderson and Whitwell revealed that after curettage alone the recurrence rate is 23%¹³. This falls to 7% after wide excision¹³. The recurrence rates correlated to extent of surgical resection and developed within 2years of resection³.

Radiological and histologic grading systems do not predict clinical outcome, and extent of surgical resection has been shown to be predictive of prognosis^{2,12,20}.

Conclusion

Giant cell tumors are generally benign, locally aggressive lesions for which surgical resection is the treatment of choice. This case is the reported example of a giant cell tumor of the temporal bone in an old patient. She was to receive no radiation therapy. She remains well clinically and without tumor recurrence at 2 years after total resection. Complete surgical removal of giant cell tumor can give remission.

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