

Case Report

Giant Cell Tumor of the Frontal Bone and the Frontal Sinus

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ABSTRACT

We describe a 7-year-old girl with Giant Cell Tumor involving the frontal bone and the frontal sinus. She presented with headache and a large swelling at the forehead. On skull x-ray a large nonspecific lytic lesion was seen. Total resection of the tumor and cranioplasty of the skull defect was performed and there was no relapse after 4 - year follow-up. (Rawal Med J 2006;32:95-96)

Key Words: Frontal bone, frontal sinus, giant cell tumor, skull.

INTRODUCTION

Giant cell tumor (GCT) of the skull is a rare lesion, usually involving the sphenoid or temporal bone in adults.¹ Involvement of frontal bone and frontal sinus is extremely rare.^{2,3} In this report, we describe a giant cell tumor of the frontal bone that did well after surgical resection for a period of 4-year follow-up.

CASE REPORT

A 7-year old girl presented to our clinic with a 1-year history of headache and a large mass on her forehead from rural area of Kordestan region of Iran. At first the mass was small and located between eyebrows, and then it grew up gradually. An impressive fluctuant mass measuring 5 in 5cm was seen apparently fixed to the peripheral bone (figure1). Neurological examination revealed no cranial nerve deficits. Ocular movement was normal except for slightly limitation in medial adduction on both sides because of mass effect. Serum calcium, phosphorous, alkaline phosphatase and parathormone were in normal range. Plain skull films showed a lytic lesion across the frontal bone at the place of frontal sinus and destruction on inner and outer table of the bone.

At operation, a bicronal incision was made for adequate exposure and cosmetic purposes. There was a mildly hemorrhagic brown fragile mass with a soft central part and a firm periphery. The mass was easily resected and separated from the dura and the sagittal sinus by blunt dissection. The lesion has no obvious capsule. The tumor was completely excised with a margin of grossly noninvolved bone and the skull defect was repaired with metylmethacrylate (figure 2). The patient did well after surgery with no complications. Pathological examination revealed multinucleated giant cells and mononuclear cells. The mononuclear cells were round or oval-shaped and their nuclei resemble those in the giant cells. The nuclei lack atypia. At 4-year follow up examination no recurrence of tumor was demonstrated. She did not have any complaints and cosmetic result was excellent. Methylmethacrylate, which was used to repair the skull defect, had no interference with normal growth of adjacent bones (figure 2).

DISCUSSION

Giant cell tumor or osteoclastoma is an uncommon primary bone neoplasm that usually affects the epiphysis of long bones.⁴ Distal aspects of the femur, proximal part of the tibia and distal end of the radius are the most common sites.⁵ GCT of the skull is uncommon and accounts, for less than 2% of all GCTs.^{3,6} The most commonly involved site is the endocondral bone of the middle fossa floor and this is likely related to their endocondral histogenesis.^{3,4,6,7} There is a female predominance, and

age at presentation is usually in the second and third decades. Its occurrence in the skull of prepubertal individuals is extremely rare.⁷ Very few cases of GCT in the calvarium have been reported.^{3,5,7,8}

The clinical presentation depends on the site of origin. Sphenoid bone tumors present with headache, ophthalmoparesis, trigeminal hypesthesia, and vision failure. Temporal bone GCT presents with pain behind the ear on the affected site, deafness, and facial weakness.^{4,6} Involvement of the calvarium usually presents with headache, swelling, and pain in the mass.^{3,7,8} Radiographically, the most common finding is bony erosion with a destructive mass.^{3,6} On CT and MRI GCT has no specific appearance.³ Radiological differential diagnosis of GCT of skull include chondrosarcoma, osteolytic metastasis, and other fibroosseous lesion, as well as giant cell reparative granuloma and brown tumor of hyperparathyroidism.^{6,7,9} Histological features of GCT include plump oval or spindle-shaped stromal cells, similarity of the stromal and giant cell nuclei, and even dispersion of the giant cells throughout the lesion.⁷

The optimal management of GCT is surgical removal and, if completed this is usually curative.⁴ Hypervascular tumors could be treated with preoperative embolization.^{3,6} In GCT of the skull bones, the best therapeutic results appear to be a combination of surgical excision and radiation therapy.² Malignant transformation reported in GCTs of long bones usually (but not exclusively) occurs after irradiation, thus, in regions where complete excision of the tumor is possible (such as calvaria) surgical treatment without radiotherapy seems to be desirable.^{1,3,5,8} In the case presented, the location and the age group was unusual, but we find the lesion to be a GCT after careful histological examination. Calvarium is a rare location for GCT of the frontal bone.^{10,11} and involvement of frontal sinus is even rare.⁸ Cranioplasty with methylmethacrylate lead to good cosmetic result in this patient and there was no relapse after four years of surgical treatment without radiation therapy.

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Figure1. Before operation, a large mass is seen in the middle part of the frontal bone.



Figure 2. Four years after the operation good cosmetic results.

