

Case Report

Giant cell tumor of the frontal sinus: case report

Ali Alzarei¹, Majed Assiri¹, Rabab N. B.², Wael Aljoraebi³, Ibrahim Sumaily^{1*}

¹Department of Otorhinolaryngology, Head and Neck Surgery, ²Department of Histopathology, Asir Central Hospital, Abha, KSA

³Department of Otorhinolaryngology, Head and Neck Surgery, Prince Mohammad Bin Nasser Hospital, Jazan, KSA

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***Correspondence:**

Dr. Ibrahim Sumaily,

E-mail: sumaily.i@gmail.com

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ABSTRACT

Giant cell tumor (GCT) is an uncommon aggressive primary bone tumor usually affects long bones. It is rarely involving skull bones, and to less extent the frontal bone. Up to date only 3 adult cases reported of the frontal bone, only one of them was occupying the frontal sinus. Here, we present a 49 year old male presented with slowly growing left supraorbital swelling for 3 years. This swelling was a firm mass with destruction of anterior table of frontal bone. Diagnostic radiological work-up showed a mass in left frontal sinus, mass excised with external approach. Reporting this case with its clinical, radiological and histopathological images should add significant material to the literature for further studies of GCT of paranasal sinuses.

Keywords: Giant cell, Bone tumor, Frontal sinus, Paranasal sinus

INTRODUCTION

GCT is an uncommon, very challenging, locally aggressive, benign primary bone tumor with risk metastasis and malignant transformation.¹ GCT was first described by Cooper and Travers in 1818.² It is usually encountered by orthopedic surgeons as a long bone tumor.³ It is very rarely encountered in skull bones where it predominantly affects temporal and sphenoid bones.⁴ Therefore it is extremely rare to present as a frontal bone mass. There are only 3 cases reported in the English literature as a GCT of frontal bone in adult patients and 1 pediatric patient.⁵⁻⁷ Only one of them was a frontal sinus occupying mass.⁵ None of these case reports included a complete clinical, radiological and histopathological demonstration.

CASE REPORT

A 49 year old male, presented to rhinology clinic with a 3 year history of a large, gradually progressive left

supraorbital mass. The mass is painless and is not associated with any nasal secretions or external discharge, or other nasal or visual symptoms. He is known to have HTN and Bronchial Asthma for several years. On presentation the mass was very obvious on left supraorbital and frontal area about 5 x 3 cm with normal covering skin and normal eye movement and vision (Figure 1). Other otorhinolaryngology and neurological evaluations were unremarkable.

Radiological evaluation done including computed tomography (CT) and magnetic resonance imaging (MRI). CT showed isodense lesion with areas of calcifications in the left frontal sinus destructing the anterior table of the sinus and significant enhancement with the IV contrast (Figure 2). On MRI the lesion was isointense to the muscle on both T1 and T2 with central hyperintensity, and significant enhancement with intravenous contrast, and no invasion to skin or meninges (Figure 3).



Figure 1: The clinical appearance of the tumor preoperatively.

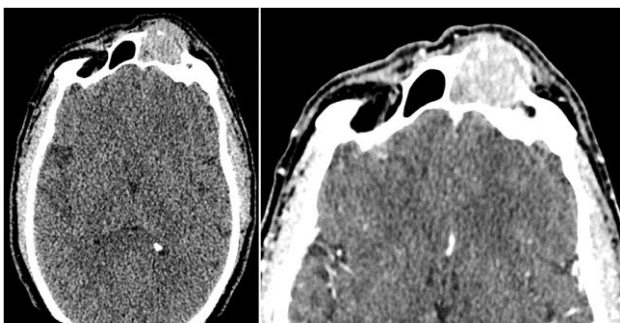


Figure 2: CT scan with and without IV contrast showed isodense lesion with areas of calcifications in the left frontal sinus destructing the anterior table of the sinus and significant enhancement with the IV contrast.

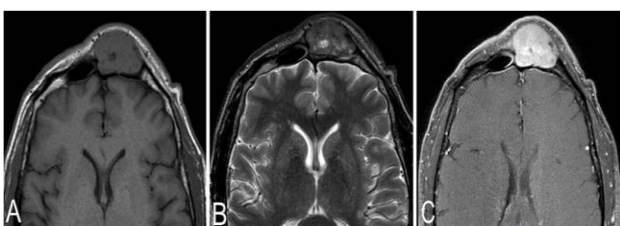


Figure 3: The MRI findings, where the lesion was isointense to brain on both T1 and T2 with central hyperintensity (A and B), and significant enhancement with IV contrast (C), and no invasion to skin or meninges.

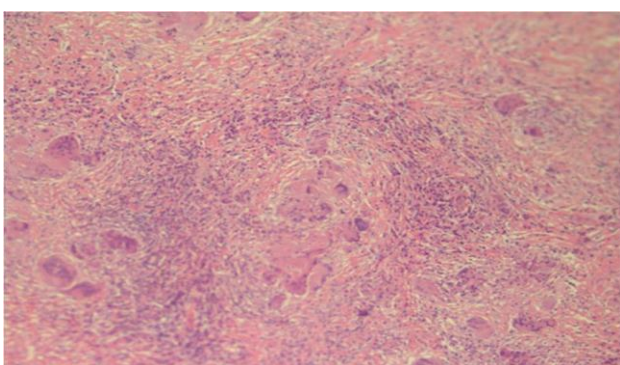


Figure 4A: Histopathology hematoxylin and eosin stained slides (A: 200 X sheets of giant cells surrounded by inflammatory cells).

The patient underwent complete excision of the tumor with the involved parts of the anterior table of left frontal sinus through an external approach. Histopathologically the tumor is composed of extensive amount of giant cells and consistent with GCT (Figure 4). The patient followed up in the rhinology clinic and showed no recurrence over 6 months of follow up.

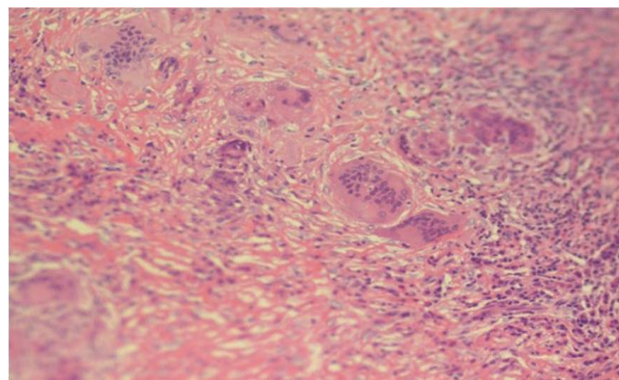


Figure 4B: Histopathology hematoxylin and eosin stained slides (B: 400 X sheet of giant cells surrounded by inflammatory cells).

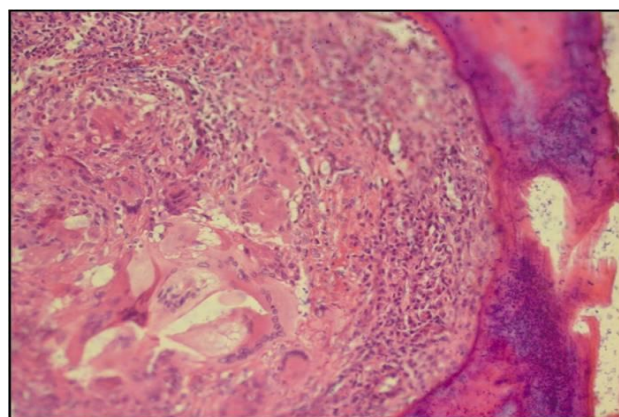


Figure 4C: Histopathology hematoxylin and eosin stained slides (C: the lesion is invading the bony trabeculae, 400 X).

DISCUSSION

GCT is a benign primary bone tumor, thought to be derived from hematopoietic system monocytic and histiocytic cell. This explains why in some references it is called osteoclastoma.⁸ It was firstly described by Cooper and Travers in 1818.² It is considered the most challenging benign bone tumor because of its aggressive behavior, difficult complete excision and risk of recurrence, metastasis and malignant transformation. It represents about 5% of primary bone tumor and commonly affects the epiphysis of long bones.³ It is relatively more predominant in female.⁸

Primary bone tumors in the skull are generally uncommon and account for 2.5% only, of these tumors is

the GCT, which thereby is considered a rare tumor in the skull bones, and when it occurs it prefers the sphenoid and temporal bones.⁴

In the English literature, only three cases reported of such tumor involving the frontal bone in adults and one pediatric patient.⁵⁻⁷ Only one of these cases was filling the frontal sinus.

Hlaváček et al. described their first 2 cases report of frontal giant cell tumor as a polyostotic form of the disease. The first patient present with disease involving the acromion and the frontal sinus, and in the other patient it was extending from frontal to ethmoid labyrinth. Both cases were treated surgically and showed no recurrence within 2 years of follow up.¹⁰

The approach to patient with suspected GCT should include radiological work up in the form of CT and MRI to assess the extent of the tumor and exclude other possible diagnoses.¹⁰ The tumor usually enhances with the intravenous contrast.

The treatment of choice for GCTs is surgical excision. Radiotherapy role in the treatment of GCT is still controversial. So, it is reserved for unresectable tumors, and in general it showed a good outcome.⁹

The malignant transformation of GCT occurs in 5-10% of cases.^{11,12} For diagnosis of malignant transformation of GCT, the following criteria has to be considered.¹³

- The number of giant cells and respective nuclei.
- The mitotic index.
- The Osteoid development.
- The presence of cell atypias or metaplasias.

In our patient, it was isolated to the frontal sinus. The presenting symptom was mainly the swelling, which is a usual presenting symptom. But with no pain as what is usually the most presenting symptom in GCTs.⁴ The CT scan showed a bony destructive mass with contrast enhancement as the usual with GCT, and the MRI ruled out any intracranial extension of the tumor.¹⁰ The patient underwent only excisional biopsy of the mass which established the diagnosis of GCT, and, in 6 months follow up, no further management for the primary bone disease was required as there was no recurrence.

CONCLUSION

GCT is one of the differential diagnoses of paranasal sinus tumor. It should be considered preoperatively so prompt surgical excision to be achieved, which usually is enough as a primary management. There is a relatively

high risk of recurrence as well as malignant transformation. Therefore, regular long term follow up is advised to avoid missing such sequelae.

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REFERENCES

1. Campanacci M, Baldini N, Boriani S, Sudanese A. Giant-cell tumor of bone. *J Bone Joint Surg Am.* 1987;69(1):106-14.
2. Cooper AS, Travers B. *Surgical Essays.* London, England: Cox Longman & Co; 1818: 178-9.
3. Kos CB, Taconis WK, Fidler MW, ten Velden JJ. Multifocal giant cell tumors in the spine: a case report. *Spine.* 1997;22(7):821-2.
4. Chan J, Gannon FH, Thompson LD. Malignant giant cell tumor of the sphenoid. *Ann Diagn Pathol.* 2003;7:100-5.
5. Matushita JP, Matushita JS, Simões LAM, Neto LFC, Matushita CS, Junior JPK Jr. Giant cell tumor of the frontal sinus: case report. *Radiologia Brasileira.* 2013;46(4):255-8.
6. Hlaváček V, Jolma VH. Giant cell tumors of bone in the E.N.T. organs. Report of two cases in the frontal sinus. *Acta Otolaryngol.* 1974;77:374-80.
7. Ulu MO, Biceroglu H, Ozlen F, Oz B, Gazioglu N. Giant cell tumor of the frontal bone in an 18-month-old girl: a case report. *Cent Eur Neurosurg.* 2010;71(2):104-7.
8. Mirra JM. Giant cell tumor (osteoclastoma). *Bone Tumors.* Philadelphia: Lea & Febiger; 1989: 119-120.
9. Mendenhall WM, Zlotecki RA, Scarborough MT, Gibbs CP, Mendenhall NP. Giant cell tumor of bone. *Am J Clin Oncol.* 2006;29(1):96-9.
10. Lee HJ, Lum C. Giant-cell tumor of the skull base. *Neuroradiol.* 1999;41(4):305-7.
11. Leonard J, Gökden M, Kyriakos M, Derdeyn CP, Rich KM. Malignant giant-cell tumor of the parietal bone: case report and review of the literature. *Neurosurgery.* 2001;48(2):424-9.
12. Roux S. Giant cell tumors of bone. *Rev Rhum Engl Ed.* 1998;65(2):139-47.
13. Jaffe JL, Lichtenstein L, Portis RB. Giant cell tumor of bone: its pathologic appearance, grading, and supposed variants and treatment. *Arch Pathol.* 1940;30:993-1031.

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