Temporal bone giant cell tumour: report of a second primary giant cell tumour of the temporal bone and infratemporal fossa

D. S. Roberts, W. C. Faquin and D. G. Deschler

1Department of Otolaryngology, Massachusetts Eye and Ear Infirmary, Harvard Medical School, Boston, MA 02114, USA; 2Department of Pathology, Massachusetts Eye and Ear Infirmary and Massachusetts General Hospital, Boston, MA 02114, USA

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Abstract. Temporal bone giant cell tumour: report of a second primary giant cell tumour of the temporal bone and infratemporal fossa. Objective: To report a second primary giant cell tumour (GCT) of the temporal bone and infratemporal fossa. Methodology: Medical records were analyzed in the context of the available literature. Results: A 30 year-old male developed a temporal bone GCT with infratemporal fossa extension 12 years after undergoing successful surgical treatment of a GCT of the femur. These tumours were histologically distinct, suggesting the development of a second primary GCT rather than metastatic disease. This case differs from prior reported cases by surgical approach. Complete removal was achieved but required resection of the zygomatic arch and dissection of all upper facial nerve branches. The patient is disease free after 3 years with acceptable functional and cosmetic results. Conclusion: Complete resection of GCTs of the temporal bone and infratemporal fossa is advocated. Surgical techniques that allow for visualization of the facial nerve and increase surgical access can enhance overall clinical success.

Introduction

Giant cell tumours (GCTs) are neoplasms that most often occur at the ends of long bones but may involve the skull. GCTs originate from non-osteogenic stromal cells of bone marrow, account for 5% of bone tumours, and may be locally aggressive. Large case series suggest that temporal bone involvement is rare (1/546 cases).1 First line treatment for GCTs is surgical resection. Recurrence reflects the inadequacy of treatment and successful surgical management is associated with the extent of resection.2,3 When metastases occur, the lung is most commonly impacted.4

We report the first case of two histologically unique giant cell tumours occurring in the same patient. Our patient developed a temporal bone GCT and zygomatic arch involvement with infratemporal fossa extension. This patient had a history of a previous GCT of the femur with histological features suggesting the development of a second primary GCT rather than metastatic disease to the temporal bone. Our surgical management illustrates how complicated lesions of the head and neck often require superior surgical access to ensure clinical success with limited post-operative morbidity.

Case report

An 18 year-old healthy male underwent curettage and cement packing for pathologically proven GCT of the right distal femur. 4 months later, recurrent disease was noted and definitive resection was performed.

12 years later a palpable and observable fullness in the superior parotid bed and posterior aspect of the zygomatic arch was noted. Cranial nerves were intact with no adenopathy.

Imaging showed an enhancing lesion of the left upper parotid and infratemporal fossa (Figure 1).

The patient underwent wide local excision of the temporal bone and infratemporal fossa (Figure 1).

Histologic evaluation revealed a cellular tumour comprised of numerous multinucleated osteoclast-type giant cells within a background of mononuclear cells. The neoplasm exhibited features
of conventional giant cell tumour of bone, and lacked giant cell poor areas as were present in the patient’s prior femur tumour (Figure 2). The temporal bone GCT showed destruction and replacement of bone along with focal pushing extension into surrounding skeletal muscle and erosion of articular cartilage of the temporomandibular joint.

Discussion

GCTs of the temporal bone with infratemporal fossa extension are exceedingly rare. Surgical resection is the primary management choice. Surgical approach can impact local recurrence rates. Orthopedic literature suggests that wide excision may be curative while marginal excision recurrence rates are 8% and intralesional excision can lead to recurrence in 27% of cases. Others successfully report gross total removal and curettage of GCTs in the temporal bone as viable treatment option. Complete surgical excision is advocated when tumour location in the head and neck is amenable to total excision.

In this case, pathology suggests the development of a second primary GCT in the temporal bone rather than metastatic disease or the formation of a giant cell granuloma (GCG). GCTs may be composed of three cell types that include stromal cells, mononuclear histiocytic cells, and multinucleated giant cells. These tumours are differentiated from giant cell granuloma (GCG) that may also form in the temporal bone. GCG differs from GCT in that giant cells cluster around areas of necrosis with acellular stroma. Giant cells within GCGs are also associated with a higher number of nuclei. The temporal bone GCT in our case illustrates prominent multinucleated giant cells while the femoral GCT showed an atypical population of mononuclear cells as well as giant cell poor areas. While both cases represent GCTs, these tumours are histologically distinct representing the first repor-
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ted case of the development of a second primary GCT in the temporal bone after initial presentation a femoral GCT years before.

Complete removal was achieved with resection of the zygomatic arch and dissection of all upper facial nerve branches. This was tolerated well with acceptable functional and cosmetic results. The patient is disease free after 3 years without facial nerve deficits.

Due to the risk for recurrence, complete resection of GCTs of the temporal bone and infratemporal fossa is advocated. Surgical techniques that allow for visualization of the facial nerve and increase surgical access can enhance overall clinical success with limited post-operative morbidity. Superior surgical access and wide local excision are required to ensure optimal outcomes in GCTs of the head and neck.

References


Daniel Roberts
Massachusetts Eye and Ear Infirmary
243 Charles Street
Boston, MA 02114, USA
Tel.: 617-573-3654
Fax: 617-573-3939
E-mail: Daniel_Roberts@meei.harvard.edu