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Short clinical case

"Giant cell reparative tumor: An exceptional differential diagnosis for a lytic lesion of the temporal bone"

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ABSTRACT

Background and importance. – Giant cell reparative granuloma is a very rare benign osteolytic lesion. It typically arises in the mandible and rarely involves the skull.
Clinical presentation. – A 25-year-old male was admitted in August 2002 for a painless left preauricular mass of several months duration. CT scan revealed an osteolytic extradural lesion located in the temporal bone, with extension to infratemporal fossa. We performed a surgical partial resection of the tumour via a frontotemporal approach. At 36 months after surgery, the lesion continued growth and subsequently we decided to perform a preauricular infratemporal approach. After a ten year-follow-up, the patient remained asymptomatic and a small tumour remnant was visible and stable.
Conclusion. – Giant cell reparative granulomas that originate from the temporal bone are exceptional. There are no typical radiological features of this disease. Diagnosis is confirmed by analysis of the surgical specimen. Tumor growth requires surgical resection.

1. Introduction

Giant cell reparative granulomas (GCRG) are a rare and uncommon osteolytic lesion of the temporal bone. It most commonly occurs at the level of the mandible, followed by the sphenoid bone, craniofacial bones, and the bones of hands and feet. We present a description of a GCRG involving the temporal bone, surgically treated. The authors show that optimal resection followed by a sequential follow-up insure long-term of this benign lesion.

2. Case report

A 25-year-old male was initially admitted to our neurosurgical unit in 2002 for a painless preauricular mass of several months duration (Fig. 2A). The patient observed a gradual augmentation of the preauricular deformity. The examination showed a narrowing of the external auditory canal. He was neurologically intact. CT scan and angiography revealed an osteolytic temporal and infratemporal lesion (Fig. 1A), hyperdense contrast-enhancing lesion, hypervascularized fed by the maxillary artery (Fig. 1B). These features were compatible with an aneurysmal bone cyst.

The patient was operated on via a frontotemporal approach (Fig. 2B). The deep temporal fascia was infiltrated by the tumour and was excised separately (Fig. 2C). The tumour was firm, reddish brown and vascular (Fig. 2F). It had destroyed the squamous temporal bone in its vertical and horizontal part, with limited involvement of the greater wing of the sphenoid. Macroscopically the dura was not invaded (Fig. 2E). The internal limit of resection was the mandibular condyle (MC). Piecemeal subtotal removal of the tumour was successfully achieved.

Microscopic examination of the tissue revealed fibrosis-like changes with a proliferation of fibroblasts and multinucleated giant cells distributed within the stroma. Variably sized areas of haemorrhage with hemosiderin deposition were observed throughout the specimen. Osteoid formation and new bone formation were found with diffuse infiltration of scattered inflammatory cells (Fig. 3). The tumour harboured recurrent somatic mutations in two genes, *H3F3A* and *H3F3B*, encoding the replication-independent histone 3.3. *H3F3A* and *H3F3B* reside on chromosomes 1 and 17, respectively. Based on these pathological characteristics, the diagnosis was GCRG. The patient was discharged after ten days, with no clinical deficit. The postop MR revealed a tumour remnant,

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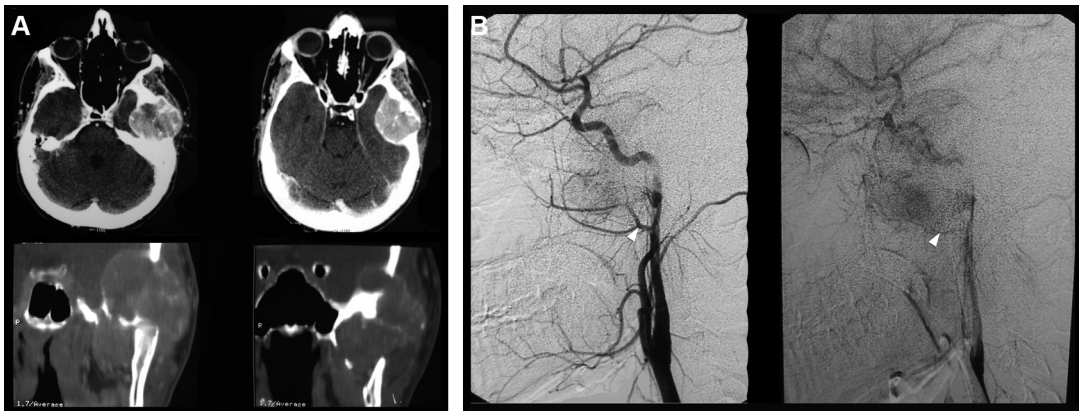

Fig. 1. A: injected preoperative CT: a sharply defined expansive osteolytic temporal and infratemporal lesion, hyperdense contrast-enhancing lesion. Bone CT scan showed infratemporal extension, pushing downward and medially pterygoid muscles; B: preoperative digital subtraction angiography (DSA): hypervascular tumor fed by maxillary artery (white arrow).

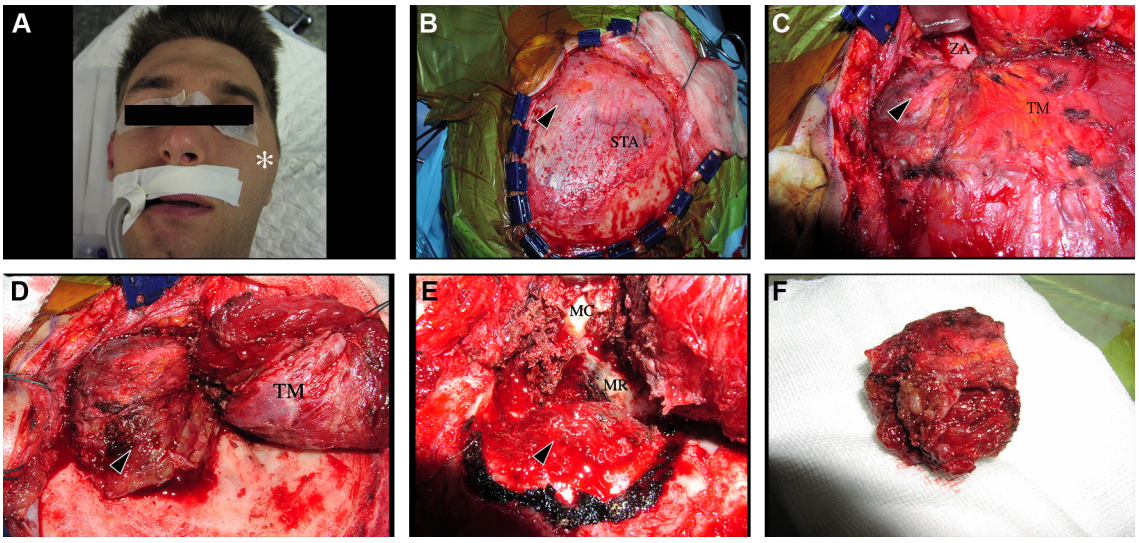

Fig. 2. Perioperative photographs, left side, first surgery: A: note the left preauricular mass (*); B: left frontotemporal approach, the tumor [black arrow] was medial to the superficial temporal aponeurosis muscle [STA]; C: tumor exposure [black arrow] after opening and retraction of the superficial temporal aponeurosis. Note the temporal muscle [TM] and the posterior part of zygomatic arch [ZA]. D: temporal muscle retraction [TM] and easily tumor excision [black arrow]; E: one-piece tumor removal. Note the dura, not invaded [black arrow], the mandibular condyle [MC], the retromaxillozygomatic region of the infratemporal fossa [inside the dotted line], the mandibular ramus [RM]. F: the tumor: a giant cell reparative granuloma.

medially to the mandibular condyle. After 36 months follow-up, this remnant was growing up (Fig. 4A–C).

We performed another surgical procedure that included an infratemporal fossa exposure, with no resection of the MC (Fig. 4D–F). In the postoperative course, the patient experienced cophosis, transient facial nerve palsy (House–Brackmann grade III) and transient V2 hypoesthesia. The cophosis remained stable at ten years follow-up.

3. Discussion

The term giant cell reparative granuloma was first proposed by Jaffe in 1953 [1], and the corresponding pathological diagnostic criteria for GCRG were developed at that time to distinguish it from giant cell tumour (GCT), aneurysmal bone cyst, fibrous dysplasia, hyperparathyroidism of brown tumours, and other diseases [1–3]. Since then, most GCRGs have been reported to be located in

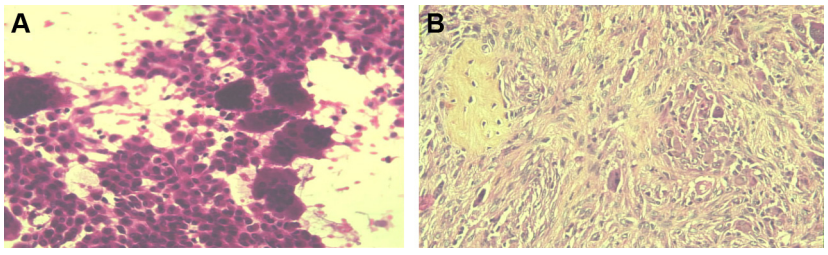

Fig. 3. Anatomopathology: Histologically, giant cell reparative granuloma is composed of small, elongated or oval-shaped stroma cells admixed with multinucleated giant cells. Osteoid or new bone formation, hemorrhage, and hemosiderin deposits without necrosis are encountered in giant cell reparative granuloma.

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