Central Giant Cell Granuloma of the Mandible: A Case Report

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Abstract: The central giant cell granuloma (CGCG) of the jaws is a rare benign tumour of the mandible (lower jaw) and the maxilla (upper jaw) characterized by destruction of the bone, loss of symmetry of the face and displacement of teeth and tooth germs, especially in younger patients. It is asymptomatic and present with slow growth often accompanied by dental mobility. The removal of this tumour is mutilating and is followed prosthetic rehabilitation. The aim of this study was to report a case of central giant cell granuloma localized to the symphyseal region in a young patient. The case reported is that of a 14-year-old girl who received a consultation for a tumor in the symphysical region causing an aesthetic impact. The tumor was firm, painless and had been developing for about a year. The cortical were broken in places, in transverse, sagittal and coronal sections. The treatment consisted of her excision under general anesthesia causing a significant loss of substance. The tumor mass, very hemorrhagic, was extended to the buccal floor. At the end of the intervention, a significant loss of substance was observed. Two months later, a partial adjunct prosthesis was performed. The anatomo-pathological examination showed of several multinucleated giant cells, a few histiocytes, lymphocytes and fibroblasts. The removal of this aggressive tumour remains mutilating, with significant psychological repercussions. More recently, antiangiogenic therapy with interferon alpha has been successfully applied.

Keywords: Central Giant Cell Granuloma, Mandible, Removal

1. Introduction

In 1953, Jaffe described this lesion as a «giant-cell reparative granuloma». The term «reparative» has been abandoned since due to the differentiation of central giant cell lesions between aggressive and non-aggressive lesions [1].

The central giant cell granuloma (CGCG) is an infrequent, osteolytic and aggressive benign jaw tumor [1]. It is often asymptomatic and present with slow growth often accompanied by dental mobility [2]. According to Chrcaonovic, the lesion was more prevalent in women than in men. The mean age of the patients was 25.8±15.3 years. The highest prevalence in the second and then third decade of life [3]. Its etiology remains unknown. There are two types of clinical progression: nonaggressive and aggressive. The aggressive forms are found mainly in younger patients. Some factors such as local trauma, inflammation, intraosseous hemorrhage, and genetic anomalies may be involved. However, the diagnosis can be made only by histological examination. The removal of this tumour is mutilating with significant aesthetic and psychological repercussions. Pharmacologic agents have been used as alternatives to surgical management [3]. The authors report a case of a central giant cell granuloma developed in the symphyseal and alveolar regions. The treatment consisted of the removal
of the tumour under general anaesthesia.

2. Case Report

A 14-year-old girl was seen for a tumor in the symphysis area that caused aesthetic damage and had been evolving for about a year. Exobuccal profile examination showed a lower lip eversion with an erased lip and chin groove (figure 1). On endobuccal examination, there was an outgrowth of the tumor towards the lower lip and a filling of the buccal floor. The mucous membrane was healthy. The tumor was firm, painless with the incisor block moved and the 41 absent (figure 1).

The CT scan showed oval, hypodense, voluminous and blowing formation with thin bone walls. It measured about 50x38x32 mm. The cortical were broken in places, in transverse, sagittal and coronal sections (figure 2).

Clinical and paraclinical signs were in favour of a benign osteolytic tumor. The treatment consisted of the removal of the tumour under general anaesthesia. After extraction of the incisor block, two incisions were made at the vestibular and lingual sulcular level from the 44 to the 34. A detachment combined with dissection allowed the mucosa to be released from the tumor mass. The removal of this mass, which is very adherent to the bone, was carried out with a gouge forceps. The tumor mass, very hemorrhagic, was extended to the buccal floor. At the end of the intervention, a significant loss of substance was observed (figure 3). The operating part consisted of 5 irregular tissue fragments and 5 teeth, the incisivo-canine block (figure 3).

The lower lip was without dentoalveolar support and healing was complete fifteen days later (figure 4).

The anatomo-pathological examination was in favor of the central granuloma giant cells. It was a connective tumor consisting of several multinucleated giant cells, a few histiocytes, lymphocytes and fibroblasts. It is associated with congestive vascular cavities and bone spans (figure 5). Two months later, a partial adjunct prosthesis was performed (figure 6). The patient followed up 3 months after the surgery. There was no residual symptomatology.

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Figure 1. Preoperative view

(left). Lower lip eversion erasing the lip chin groove, (right) Floor filling and dental movements.

Figure 2. Voluminous radioclear image blowing cortical arteries with significant ruptures in places.

CS: sagittal section, CT: cross section, CF: frontal section.

Figure 3. Peroperative view.

(left) Significant loss of substance after excision: (right) The operating part consisted of 5 tissue fragments and teeth.

Figure 4. Exobuccal and: endobuccal controls, 15 days later.

Figure 5. Multinucleated giant cells with vascular cavities.
but non-corticated borders. With increasing size, benign osteolytic tumors are discovered most often before the age of 20 years. In 2/3 of cases, the mandible is predominantly affected before age [6, 7].

Anatomical obstacles such as the mandible canal and the chin foramen may limit the resectability of the lesion. The beam cone beam CT often shows a mixed radiographic pattern, with opacities, scalloped, and mostly well-defined expansile, radiolucent, and often multiloculated lesions, rarely with cortical ruptures. CT often shows a somewhat lobular appearance. Mitoses are frequently involved in the activity of osteoclasts, of which giant cells are part, has been discovered in CGCG [13].

The recurrence rate after excision represents about 50% with a risk of malignant transformation into sarcoma between 10 and 12% [14]. Histopathologically, it has a proliferation of multinucleated giant cells within a connective tissue formed of ovoid or tapered mesenchymal cells. [15, 16].

The lesion consists of spindle-shaped fibroblastic or myofibroblastic cells, loosely arranged in a fibrous, sometimes fibromyxoid, vascularized tissue with haemorrhagic areas, haemosiderin deposits, macrophages, lymphocytes, granulocytes and, rarely, plasma cells. Especially in the haemorrhagic areas, evenly dispersed or small clusters of osteoclast-like giant cells are found. In addition, traversing collagen bundles are present, often accompanied by metaplastic bone formation, giving the lesion a somewhat lobular appearance. Mitoses are frequently found [16].

Higher overall expression of VEGF in CGCG might lead to increased vascularity as well as more destructive nature. VEGF is involved in tumor growth via the mechanism of neoangiogenesis to meet the oxygen and nutrient requirement of tumor cells and is involved in pathogenesis [17].

The CGCL is a localized benign but sometimes aggressive osteolytic proliferation consisting of fibrous tissue with haemorrhage and haemosiderin deposits, presence of
osteoclast-like giant cells and reactive bone formation [1].

The CGCG is a very mutilating benign tumor whose removal has aesthetic and functional repercussions that can go as far as the interruption of mandibular continuity. 3D imaging, such as the scanner or the beam cone, allows for better planning of the surgical procedure and the prosthetic project [8]. The recurrence rate of CGCG ranges from 10 to 15%. Aggressive lesions (22.8%) recurred after surgical treatment, compared to non-aggressive lesions (7.8%) [3]. The following factors showed a statistically significant increase in the recurrence rate: curettage, enucleation or marginal resection in relation to segmental resection, aggressive lesions, cortical bone perforation, and tooth root resorption [3].

4. Conclusion

The management of CGCG can include conventional surgery with or without medical adjunctive treatment or resection in-bloc for the aggressive variant. Histological findings are not predictive of biological behaviour. The treatment of CGCL is careful enucleation. In case of recurrences, more extensive surgery should be considered. Administration of calcitonin or glucocorticoids (intralesional) has proven effective in some cases. More recently, antiangiogenic therapy with interferon alpha has been successfully applied.

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