Peripheral giant cell granuloma

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Abstract

Peripheral giant cell granuloma or the so-called "giant cell epulis" is the most common oral giant cell lesion. It normally presents as a soft tissue purplish-red nodule consisting of multinucleated giant cells in a background of mononuclear stromal cells and extravasated red blood cells. This lesion probably does not represent a true neoplasm, but rather may be reactive in nature, believed to be stimulated by local irritation or trauma, but the cause is not certainly known. This article reports a case of peripheral giant cell granuloma arising at the maxillary anterior region in a 22-year-old female patient. The lesion was completely excised to the periosteum level and there is no residual or recurrent swelling or bony defect apparent in the area of biopsy after a follow-up period of 6 months.

Keywords: Peripheral giant cell granuloma/giant cell epulis, Jaw,reactive

Introduction

Peripheral giant cell granuloma (PGCG) is the most common oral giant cell lesion appearing as a soft tissue extra-osseous purplish-red nodule consisting of multinucleated giant cells in a background of mononuclear stromal cells and extravasated red blood cells.

This lesion is probably not present as a true neoplasm, but rather may be reactive in nature. The initiating stimulus has been believed to be due to local irritation or trauma, but the cause is not certainly known. It has been termed a peripheral giant cell "reparative" granuloma, but whether it is in fact reparative has not been established and its osteoclastic activity nature appears doubtful. Its membrane receptors for calcitonin demonstrated by immunohistochemistry and its osteoclastic activity when cultured *in vitro* are evidences that the lesions are osteoclasts,[1-5] whereas other authors have suggested that the lesion is formed by cells of the mononuclear phagocyte system.[6] The PGCG bears a close microscopic resemblance to the central giant cell granuloma, and some pathologists believe that it may represent a soft tissue counterpart of the central bony lesion.[7]

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Case Report

A 22-year-old female patient reported to the Department of Oral and Maxillofacial Surgery with the complaint of swelling in the left upper jaw since 1 year. History revealed that the swelling started as a small one and progressively increased to the present size over a period of 1 year. It was associated with intermittent pain. There was no history of trauma, neurological deficit, fever, loss of appetite, loss of weight. There was no similar swelling present in any other part of the body. The patient was systemically healthy.

On extraoral examination, a single, diffuse swelling was seen on the left side of the face in the region of anterior maxilla. The swelling measured about 2 × 1.5 cm. The surface of the swelling was lobulated and present in relation to 11 21 22. The swelling was firm in consistency and bluish in color, and the overlying mucus membrane was intact [Figure 1]. Orthopantomogram, intraoral periapical radiographs, and maxillary occlusal radiograph showed no bone resorption. The fine needle aspiration cytology (FNAC) features showed numerous giant cells in a hemorrhagic background. Spindle cells/inflammatory cells were not seen.

Surgery (excisional biopsy) was planned under local anesthesia (LA). The overlying mucosa was incised and undermined. Lesion was separated from the adjacent tissue by blunt dissection and removed in one piece [Figure 2]. Primary closure was done with 3-0 silk suture [Figure 3]. The specimen was sent for histopathologic examination. Sutures were removed after 1 week. There was no evidence of recurrence till 5 months of follow-up [Figure 4].

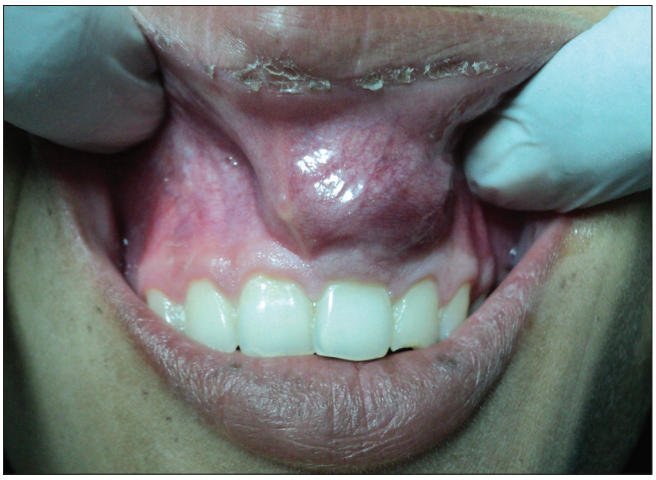

Figure 1: Preoperative intraoral presentation of lesion

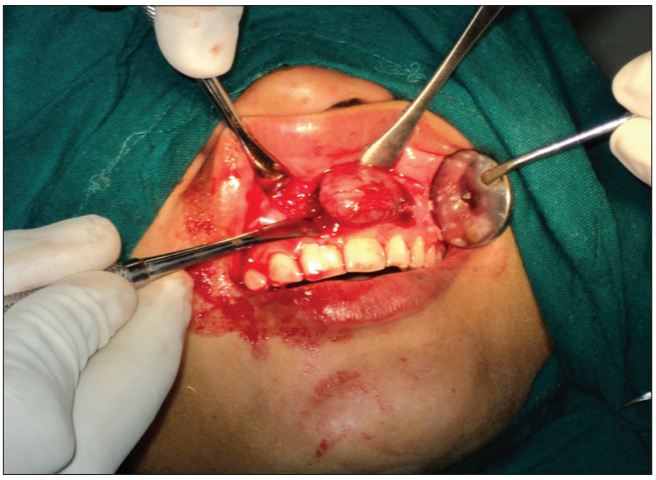

Figure 2: Excision of mass

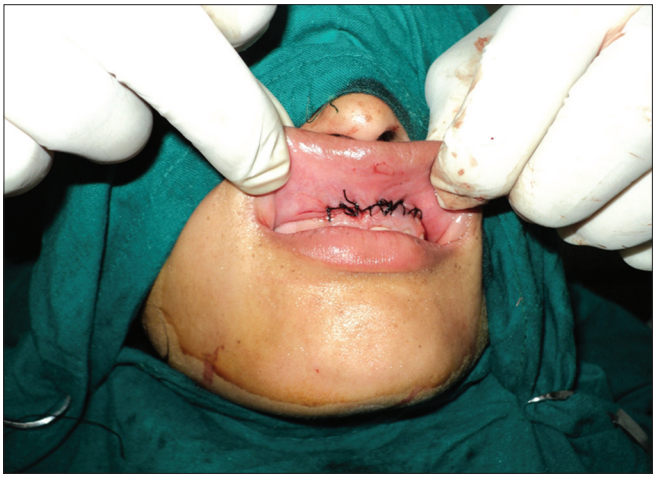

Figure 3: Immediate postoperative view

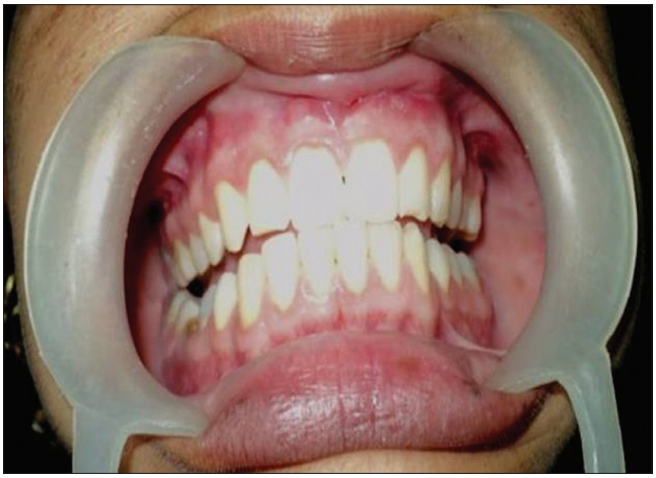

Figure 4: Postoperative view after 1 month

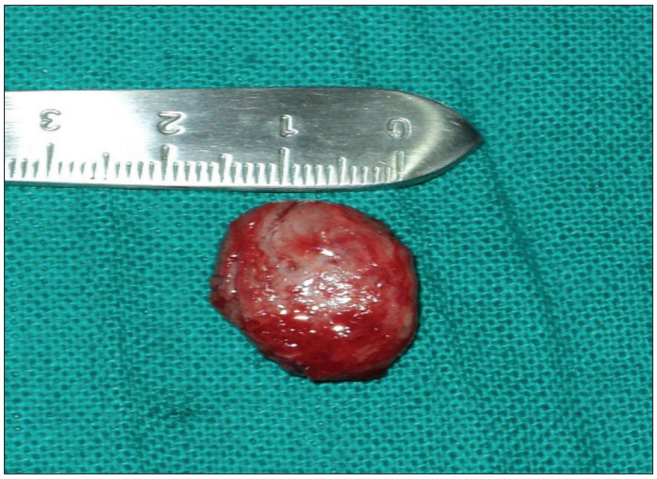

Figure 5: Measurement of excised mass

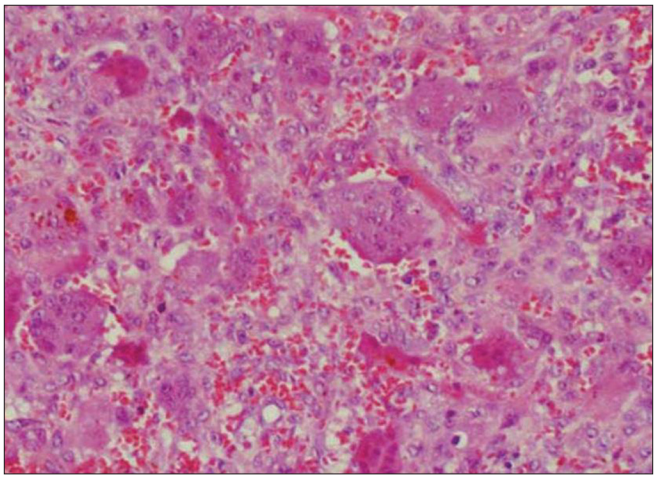

Figure 6: Histopathologic view ×10 magnification

Histopathology

Histopathologic examination of biopsied specimen revealed it to be whitish in color, oval in shape, firm in consistency and measuring about 2 × 1 cm in dimension [Figure 5]. The connective tissue stroma was highly cellular, consisting of proliferating plump fibroblasts. Numerous giant cells of various shapes and sizes, containing 8–15 nuclei, were seen with proliferating and dilated endothelial lined blood

capillaries with extravasated red blood cells (RBCs). Few giant cells were also seen inside the vascular spaces. Numerous ossifications were also seen in the stroma [Figure 6].

Discussion

The etiology and nature of PGCG (giant cell epulides) still remains undecided. In the past, several hypotheses had been proposed to explain the nature of multinucleated giant cells, including the explanation that they were osteoclasts left from physiological resorption of teeth or reaction to injury to periosteum. There is strong evidence that these cells are osteoclasts as they have been shown to possess receptors for calcitonin and were able to excavate bone *in vitro*.

The PGCG occurs throughout life, with peaks in incidence during the mixed dentitional years[8] and in the age group of 30–40 years.[7,9] It is more common among females (60%).[7,9] The mandible is affected slightly more often than the maxilla.[7,9] Lesions can become large, some attaining 2 cm in size. The clinical appearance is similar to that of the more common pyogenic granuloma, although the PGCG often is more bluish-purple compared with the bright red color of a typical pyogenic granuloma. Recently, the PGCG associated with dental implants has also been reported.[10]

Although the PGCG develops within soft tissue, "cupping" superficial resorption of the underlying alveolar bony crest is sometimes seen. At times, it may be difficult to determine whether the mass is a peripheral lesion or a central giant cell granuloma eroding through the cortical plate into the gingival soft tissues.[11,12,13]

The extra-osseous lesions of cherubism involving the gingiva appear very similar to giant cell epulides. However, the other distinctive clinical and radiographic features of cherubism will indicate the correct diagnosis.[14]

Histologically, PGCG is composed of nodules of multinucleated giant cells in a background of plump ovoid and spindle-shaped mesenchymal cells and extravasated RBCs. The giant cells may contain only a few nuclei or up to several dozen of them. Some of them are large, vesicular nuclei; others demonstrate small, pyknotic nuclei. The origin of the giant cell is unknown. Ultrastructural and immunological studies[2-6] have shown that the giant cells are derived from osteoclasts.[15]

There is also a growing body of opinion that giant cells may simply represent a reactionary component of the lesion and are derived via blood stream from bone marrow mononuclear cells and may be present only in response to an as yet unknown stimulus from the stroma. This concept is based on the results of some more recent studies using cell culture and transplantation,[16,17] in which the giant cells have been found to be short lived and to disappear early in culture in contrast to the active proliferation of the stromal cells.

A study by Willing *et al*.[18] revealed that the stromal cells secrete a variety of cytokines and differentiation factors, including monocyte chemoattractant protein-1 (MCP1), osteoclast differentiation factor (ODF), and macrophage-colony stimulating factor (M-CSF). These molecules are monocyte chemoattractants and are essential for osteoclast differentiation, suggesting that the stromal cell stimulates blood monocyte immigration into tumor tissue and enhances their fusion into osteoclast-like, multinucleated giant cells. Furthermore, the recently identified membrane-bound protein family, a disintegrin and metalloprotease (ADAM), is considered to play a role in the multinucleation of osteoclasts and macrophage-derived giant cells from mononuclear precursor cells.[19]

In the most recent study by Bo Liu *et al*.,[5] *in situ* hybridization was carried out to detect the mRNA expression of the newly identified receptor activator of nuclear factor (NF)-kappaB ligand (RANKL) that is shown to be essential in the osteoclastogenesis, its receptor, receptor activator of NF-kappaB (RANK), and its decoy receptor, osteoprotegerin (OPG). They concluded that RANKL, OPG and RANK expressed in these lesions may play important roles in the formation of multinucleated giant cells.

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