Aggressive Central Giant Cell Granuloma of the jaw- A Case Report

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Abstract
Central giant cell granuloma (CGCG) is an uncommon benign intraosseous lesion of jaws. The World Health Organization has defined it as an intraosseous lesion consisting of cellular fibrous tissue that contains multiple foci of hemorrhage, aggregations of multinucleated giant cells and occasionally trabeculae of woven bone. CGCG is of unknown etiology and uncertain pathogenesis, its histology and clinical behavior has been studied in detail. The behavior of CGCG is variable, most commonly producing an asymptomatic expansion of the jaws. However, it can be clinically aggressive, associated with pain, osseous destruction, cortical perforation, root resorption, and recurrence. Here we are presenting a case of a 32 year old female patient diagnosed as an aggressive subtype of CGCG.

Key words: Giant cells; Granuloma; Mandible.

Introduction
Central giant cell granuloma (CGCG) is considered widely to be a non-neoplastic lesion. Although formerly designated as giant cell reparative granuloma, there is little evidence that the lesion represents a reparative response. Some lesions demonstrate aggressive behavior similar to that of neoplasm (1). CGCG is an uncommon benign intraosseous lesion that occurs almost exclusively in jaws, introduced for the first time by Jaffé in 1953 (2).
The World Health Organization has defined it as an intraosseous lesion consisting of cellular fibrous tissue that contains multiple foci of hemorrhage, aggregations of multinucleated giant cells and occasionally trabeculae of woven bone (3). CGCG is of unknown etiology and uncertain pathogenesis, its histology and clinical behavior has been studied in detail. CGCG is seen usually in patients younger than 30 years old, in women more than in men, and in mandible more than in maxilla (4, 5). It is more prevalent in the anterior than the posterior jaws, often crossing the midline, and the mandible is more commonly affected than the maxilla (6, 7). The behavior of CGCG is variable, most commonly producing an asymptomatic expansion of the jaws. However, it can be clinically aggressive, associated with pain, osseous destruction, cortical perforation, root resorption, and recurrence (8). Here we are reporting a case of aggressive variant of Central giant cell granuloma present in mandible.

Case report
A 32-year-old woman presented to our department in February 2011 with a history of 2 months of swelling and pain in left side of the lower jaw. On extra oral examination, gross asymmetry of face was seen with a diffuse swelling of approximately 3X4cm size on left side of chin (figure 1). Lymph nodes were not palpable. Local examination revealed a diffuse swelling extending superiorly up to the mentolabial sulcus, inferiorly 2-2.5cm below the lower border of mandible and antero-posteriorly extending from the midline to the level of 0.5-1cm from the corner of mouth on left side. Color over the surface appeared normal; no ulceration or discharge from the swelling was seen. Surface of the swelling was smooth, hard in consistency, non-fluctuant; no rise in temperature, no pulsations was felt and non-tender on palpation.

Intraoral examination revealed root stumps in relation to left mandibular first premolar and grossly decayed right mandibular second premolar. On palpation, mild buccal cortical bone expansion was present in relation to the left mandibular second premolar. In addition, tenderness on palpation was evident in relation to left mandibular first and second premolar (figure 2).

Figure 1: Asymmetry of face seen with a diffuse swelling seen on left side of chin

Figure 2: Photograph revealing root stumps in relation to 34, grossly decayed 35.

Based on the history given by the patient and the clinical examination, a provisional diagnosis of radicular cyst in relation to left mandibular first molar was given. However, radiographic examination was suggested to confirm the provisional diagnosis.
Orthopantomograph and occlusal radiographs demonstrated normal anatomic hard tissue structures with a well-defined radiolucency measuring approximately 3.5X3cm extending anteriorly from the mesial aspect of right mandibular central incisor and posteriorly up to the left mandibular first molar region (figures 3 and 4). Lesion was surrounded by scalloped borders and was extending through the inter-radicular areas superiorly. Coronal, sagittal and axial section of CT scan showed a well-defined unilocular radiolucency, involving the left body of the mandible measuring approximately 3.1X3X1.7cm (figure 5). The lesion showed medullary expansion and thinning of lower cortical bone outline.

The patient underwent curettage of the lesion followed by mandibular resection of affected region and reconstruction with titanium reconstruction plate through an intraoral approach. Histopathological evaluation of the excisional biopsy specimen showed the presence of connective tissue stroma containing numerous young fibroblasts as well as multinucleated giant cells with a patchy distribution. Trabeculae of osteoid and woven bone were also seen in the periphery. Numerous extravasated RBCs were present within the connective tissue stroma.
Figure 6: Tissue sections showing connective tissue stroma containing numerous young fibroblasts as well as multinucleated giant cells with a patchy distribution. Numerous extravasated RBCs are present within the connective tissue stroma.

Based on the histopathological observations, it was diagnosed as CGCG. No evidence of clinical and radiological recurrence was observed during follow-up of 12 months.

Discussion

Central giant cell granuloma is considered to be a non-neoplastic proliferative lesion. CGCG commonly occurs in children and young adults, most probably below the age of 30-40 years with a slight predilection for females. In accordance, the present case was a female who was aged 32 years. The site of occurrence of CGCG is most commonly in the anterior region with predilection for mandible (66%) compared to maxilla (34%). The mandibular/maxillary ratio has been reported as being from 2:1 to 3:1. The anterior portion of the mandible has been identified as a more common location for CGCG development, with the lesion frequently crossing the midline (9, 10). Our present case also showed all the characteristics similar to the literature, such as mandibular predilection, with involvement of anterior region and it also crossed the midline. Aggressive lesions are characterized by their ability to destroy bone, resorb teeth, and displace anatomical structures, such as teeth, the mandibular canal, and the floor of maxillary antrum (11). The radiological feature of CGCG described in the literature is variable ranging from multilocular to unilocular radiolucent lesions with distinct and non-diffuse borders. The lesion in the present case was aggressive which showed rapid growth within two months with expansion and destruction of buccal cortical plates and resorption of involved roots. Radiographic features of the present case are consistent with the nature of CGCG (12, 13).

In general, CGCG is characterized histologically by a loose, slightly vascular stroma composed of both oval and spindle-shaped fibroblastic cells. Multiple areas of hemorrhage, abundant hemosiderin pigment, and marked fibrosis are always present in a central giant cell granuloma. The giant cells are multinucleated, but, unlike those in a giant cell tumor, they are relatively small and unevenly distributed. They are usually clumped around the hemorrhagic areas. The number of nuclei is lesser than in the giant cells associated with the giant cell tumor of bone. Moreover, delicate trabeculae of newly formed bone are frequently present within the tissue of a central giant cell granuloma (14).

The management of CGCG will depend on the clinical and radiographic findings. Generally, curettage of well-defined localized lesions is associated with a low rate of recurrence. In extensive lesions with radiographic evidence of perforation of cortex, a more radical excision is mandatory. In such cases even partial maxillectomy or mandibulectomy has to be done and jaw reconstructed with reconstruction plates or by placing bone graft. The present patient underwent curettage of the lesion followed by mandibular resection of affected region. Lastly, reconstruction was done with titanium reconstruction plate and no evidence of recurrence was observed after a year of treatment.
The medical management of CGCG as an adjunct to surgery includes treatment with steroids or calcitonin which inhibits osteoclastic activity (15). Interferon-alpha appears useful in the management of aggressive CGCG, presumably due to its antiangiogenic effects. Bisphosphonates have been administered intravenously in CGCG with promising results (15).

Conclusions
A case of CGCG in a 32 year old female patient is reported and its clinical, histopathological and radiological features are discussed. Aggressive variants of CGCG are found to be a rare occurrence. Hence future research is needed to clarify the pathogenesis and nature of these giant cell lesions and other markers have to be investigated.

References