Central Giant Cell Granuloma of Mandible

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ABSTRACT

The central giant cell granuloma is an uncommon, benign and proliferative lesion whose etiology is not well defined. WHO categorize it as a bone-related lesion, not a tumor, although its clinical behavior and radiographic features often are those associated with a benign tumor. Some of the lesions may exhibit a locally aggressive growth pattern with rapid tumor extension associated with teeth displacement, root resorption or bone cortical perforation. Here we present a case of central giant cell granuloma in a 23-year-old female patient associated with a painful swelling and facial asymmetry in the left mandibular region. The significant increase in size of swelling was observed during the third trimester of pregnancy. On histopathological analysis, all the classic features were noted and diagnosis of an aggressive central giant cell granuloma was made without any obscurity. Diagnosis of central giant cell granuloma remains a challenge for oral pathologists. There are many lesions, e.g. cherubism, fibrous dysplasia, brown tumor, aneurysmal bone cyst, and giant cell tumor which mimic central giant cell granuloma clinically and histopathologically. These conditions must be ruled out before making a definitive diagnosis of central giant cell granuloma.

Keywords: Benign tumor, Cherubism, Central giant cell granuloma, Diagnosis, Fibrous dysplasia


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INTRODUCTION

The central giant cell granuloma (CGCG) of the jaws symbolizes a non-neoplastic and localized benign proliferation which may sometime shows aggressive osteolytic behavior. CGCG was first described by Jaffe in 1953. The lesion commonly occurs as a solitary radiolucency with a multilocular appearance or less commonly, a unilocular appearance. 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. Clinical behavior is variable and some of the lesions may exhibit a locally aggressive growth pattern with rapid tumor extension associated with teeth displacement, root resorption or bone cortical perforation. Neville et al consider this entity to be a non-neoplastic lesion and the World Health Organization (WHO) categorize it as a bone-related lesion, not a tumor, although its clinical behavior and radiographic features often are those associated with a benign tumor. It affects females more often than males, in a 2:1 ratio and is seen most frequently under the age of 30 years.

Histologically, the features of CGCG are indistinguishable from the brown tumor of hyperparathyroidism and from giant cell lesions of genetic disorders, such as cherubism, Noonan syndrome and neurofibromatosis type I. Because of this histological similarity, it has been hypothesized that CGCG may have a genetic etiology, although there is no convincing evidence to support this hypothesis.

CASE REPORT

A 23-year-old healthy looking female patient reported to the Dental OPD complaining of a painful swelling in the left mandibular region since 1 year. It started as a painless swelling in the left mandibular canine region and gradually progressed to present size. Patient had recently given birth to a child 2 months back. The significant increase in size of swelling was observed during the third trimester of pregnancy.

Extraoral examination revealed minor facial asymmetry in the left mandibular region. All the lymph nodes were examined and found to be of normal size and consistency. On intraoral examination, a well defined, intra-bony swelling of size 4 × 3 cm was observed involving an area from distal aspect of teeth #33 till distal aspect of #37. Buccolingual expansion of cortical plates was also evident. Overlying gingiva and alveolar mucosa was smooth and color similar to the adjacent normal mucosa. No mobility of tooth was associated. On palpation, tenderness was observed in the involved area. On radiographic assessment, two well defined radiolucencies were observed. Anteroposteriorly, first radiolucency was extending from mesial aspect of #33 up to the mesial aspect of #36 and second radiolucency from distal aspect of #36 till mesial aspect of #38. Inferiorly both
the radiolucencies were extending till superior border of mandibular canal. Slight mesial displacement of #35 was evident. Considering the clinical and radiographic findings a provisional clinical diagnosis of benign odontogenic neoplasm was made.

After surgical exposure under local anesthesia, the incisional biopsy from representative area was carried out. Single piece of tissue, white to brown in color, firm in consistency, measuring around 2.0 x 2.5 cm in diameter was received in department of oral pathology. The tissue was cut in many pieces to ensure proper embedding and sectioning. On histopathological analysis, the hematoxylin and eosin stained sections revealed loose delicate exceedingly cellular, fibrillar and hemorrhagic connective tissue stroma interspersed with plump to spindle shaped proliferating fibroblasts (Figs 1A and B). Foci of new trabeculae of osteoid around the periphery of the lesion were evident. Numerous multinucleated giant cells, varying in size and predominantly concentrated near endothelial lined blood vessels along with numerous foci of extravasated blood were observed (Fig. 1B). Under higher magnification, the multinucleated giant cells showed nuclei ranging from 5 to 40 in number (Figs 1C and D). Based on clinicopathologic correlation, the lesion was diagnosed as ‘central giant cell granuloma’.

DISCUSSION

In 1953, Jaffe first described giant cell reparative granuloma (GCRG) as a benign lesion affecting the mandible and maxilla. Some authors suggested using the more neutral term ‘central giant cell lesion’ to describe this process, but most authors accept CGCG as better terminology. The term CGCG has been proposed to be used to describe both for a reactive response to hemorrhage or trauma, and a neoplasm. Chuong et al suggested that the term ‘nonaggressive’ and ‘aggressive’ should be used with CGCG based on clinical behavior. When CGCG is a slow-growing lesion, it can be asymptomatic and discovered on a routine radiographs, while the rapidly expanding aggressive variety is characterized by pain and facial swelling. The present case was also associated with significant facial asymmetry and pain.

Variable reports have been published regarding gender predilection, but the CGCG occur more commonly in females with a female-male ratio of approximately 2:1. The 60% of cases occur before the age of 30 years. In presently described case also, the patient is 23 years old female, agrees with the above observations regarding age and sex. It has

Figs 1A to D: The photomicrograph under hematoxylin and eosin-stained sections showing: (A) cellular, fibrillar and hemorrhagic connective tissue stroma along with foci of new trabeculae of osteoid around the periphery of the lesion (x40). (B) numerous multinucleated giant cells along with foci of extravasated blood (x100) and (C and D) the multinucleated giant cells with numerous nuclei under high power (x400).
been noted that the development of CGCG occasionally coincides with the onset of pregnancy. A study showed that increased levels of estrogen were responsible for the progression of CGCG in jaw. In present case, though the lesion has started before pregnancy, the size of the lesion was considerably increased during the third trimester of pregnancy.

As per the previous literature, the lesions develop twice as often in the mandible with site predilection anterior to the first molar in young patients and there is a tendency to occur in the posterior aspect of the jaws after the first two decades of life. In the case presented here, the lesion occurred just distal to canine and extending till the second molar region of left mandibular arch.

Radiographic appearance of CGCG can be unilocular or multilocular, with either well-defined or less defined margins. Root resorption and tooth displacement may also be evident. In present case, two well defined radiolucent lesions were appreciated along with displacement of teeth #35 without any root resorption. The radiographic appearance is indistinguishable from that of odontogenic cyst, aneurysmal bone cyst (ABC), ameloblastoma, odontogenic myxoma and odontogenic fibroma. Histologically, CGCG shows cellular fibrous tissue containing multiple foci of hemorrhage, aggregations of multinucleated giant cells and occasional trabeculae of bone. In presently reported case, all the classic histopathological features were noted and diagnosis was made without any obscurity. It has been confirmed by many authors that the giant cells with more than 20 nuclei occurred in a larger proportion of aggressive lesions. Considering this histologic finding, it can be affirmed that the present case fits in the aggressive variety because many giant cells seen in our case have revealed up to 40 nuclei. The pain and facial asymmetry as seen in present case also reflects its aggressive behavior clinically.

Numerous lesions as cherubism, fibrous dysplasia, primary and secondary hyperparathyroidism (brown tumor), ABC and giant cell tumor (GCT) should be considered in differential diagnosis. GCT is distinctly unusual in the jaw; moreover, giant cells are regularly and uniformly distributed in GCT, while they are clumped in areas separated by virtual absence of stroma. Aneurysmal bone cysts show large sinusoidal spaces filled with blood. Both histological and radiographic similarity has been reported in brown tumors and CGCG, but normal serum levels of calcium, phosphorus, alkaline phosphatase and good renal function help in diagnosis of CGCG and excluding the condition of hyperparathyroidism.

Cherubism (hereditary and intraosseous fibrous swellings of the jaw) is also microscopically indistinguishable from CGCG, but its usually bilateral presentation, in a young individual with a hereditary autosomal dominant mode, allows its recognition.

The traditional treatment of CGCG is represented by surgical removal via an intraoral approach and the extent of tissue removal ranges from a simple curettage to an en bloc resection. Curettage alone, or in combination with a periosteal bone resection is the treatment modality most often used. Curettage has also been supplemented with cryosurgery and peripheral ostectomy. The surgical defect usually heals by secondary intention. The prognosis was good and no recurrence was found after a follow-up of 10 months.

CONCLUSION

The case reported here represents an aggressive CGCG causing significant facial asymmetry, jaw expansion and pain. Diagnosis of CGCG remains a challenge for oral pathologists. There are many lesions which mimic CGCG clinically and histopathologically. These conditions must be ruled out before making a definitive diagnosis of CGCG.

REFERENCES