Central giant cell granuloma: A potential endodontic misdiagnosis
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Abstract
Central giant cell granuloma (CGCG) formerly called reparative giant cell granuloma is a non-neoplastic lesion of unknown etiology. It occurs most commonly in mandible. This paper reports a case of CGCG arising from anterior maxilla to highlight to the general dental practitioner the importance of histopathology in the diagnosis of this enigmatic lesion.

Key Words: Central giant cell granuloma; swellings of anterior maxilla; enucleation

Introduction
CGCG was first described by Jaffe in 1953. (1) Central giant cell granuloma is the benign lesion of unknown etiology. The World Health Organization (WHO) 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. (2) This paper reports a case of CGCG arising from anterior maxilla.

Case Report
A 23 year old female patient presented to the department of conservative and endodontics with a swelling in the left side of face for last 3-4 months. The swelling was reported to be insidious in onset and had progressed slowly from a small lesion to present size of around 2cm in diameter. It was also reported that two of her anterior teeth i.e. 21 and 22 had become mobile. The swelling was not associated with any systemic symptoms. There was no paraesthesia or nasal discharge. Medical history and family history were noncontributory.

Extra oral examination revealed a diffuse swelling on the left side of the face causing obliteration of naso-labial fold resulting in facial asymmetry. The overlying skin was normal. The swelling had no localized elevation of temperature and there was no lymphadenopathy.

Intraoral examination revealed a fair oral hygiene. There was a swelling in the labial aspect extending from the midline in relation to the upper left central incisor to the first premolar posteriorly obliterating the labial sulcus. It had a smooth surface with no fluctuation on palpation. Swelling also extended palatally and was non tender and hard to firm on palpation. The upper left central incisor and lateral incisor showed grade I mobility. The swelling also caused slight displacement of the upper left incisors. There was no discoloration of teeth and were non-tender on percussion. Clinically there was a swelling of the left anterior maxilla involving the labial and palatal aspect (Figure 1).

Vitality test revealed that maxillary left central incisor, lateral incisor and canine were non-vital. Intraoral periapical (IOPA) radiograph of upper left anterior region revealed an ill-defined radiolucency in relation to the apices and interradicular area of upper left incisors, canine and first premolar with no evidence of foci of calcification. Displacement of roots of incisors and canine was observed. Significant resorption of roots of central and lateral incisors was noted. Maxillary occlusal radiograph showed ill-defined radiolucency in relation to the apices of upper left incisors, canine and premolars.

Intraoral aspiration of the lesion was attempted with a 20-gauge needle under local anesthesia but it did not yield any aspirate. After the investigations were carried out, we ruled out radicular cyst, CEOC and fibrous dysplasia. An unproductive aspirate ruled out cystic lesions like radicular cyst and CEOC. The absence of characteristic ground glass appearance and the presence of a radiolucent lesion in the intraoral periapical (IOPA) radiograph eliminated fibrous dysplasia from diagnosis. Desmoplastic variant of ameloblastoma was ruled out because it typically presents with a mixed radiolucent and radiopaque appearance within the dense fibrous septa. Negative aspiration did not rule out AOT because this lesion may or may not be associated with aspirate. Hence based on history, clinical features and investigations we considered AOT in our diagnosis.

Histopathological examination (Figure 3 & 4) revealed numerous multinucleated giant cells which were distributed in a stroma that was highly cellular comprising both spindle shaped and round cells and were found mostly in the area of hemorrhages. The giant cells were numerous and distributed randomly, the nuclei mainly confined to

![Figure 1: Intraoral view, Figure 2: Occlusal View](Image 340x391 to 533x463)
The lesion was surgically excised under local anesthesia. The specimen was reddish in color and firm in consistency. During surgical procedure, the lesion involved right nasal floor. No cystic fluid was encountered during the surgery. Patient was prescribed antibiotics and analgesics and recalled after 7 days for suture removal.

Figure 3. H and E stained section shows highly cellular lesional connective tissue stroma with hemorrhagic area and extravagated blood elements (Original magnification 40x).

Figure 4. H and E stained section shows loose fibrillar connective tissue stroma with interspersed plump fibroblasts, prominent multinucleated giant cells, small capillaries, and numerous foci of extravagated blood elements (Original magnification 100x).

Discussion

CGCG is a non neo-plastic proliferation lesion of unknown etiology. It predominantly occurs in teens and adults. 60-70% of caries are diagnosed in patients younger than 30yrs old.(3-9) It occurs more commonly in the mandible than in the maxilla. Sometime the lesion tends to cross the mandible; females are affected more frequently than males. (Ratio 2:1) Most mandibular lesion occurs anterior to first molars and often cross the midline. It strikingly occurs more commonly on the right than left side. (10-14) CGCG also occurs in other bones of the facial skeleton and cranial vault.

Trauma has been considered as an important etiological factor in the initiation of this lesion. The lesions increase by accumulation of tissue which is produced by slow, minute, condition hemorrhages of multicentric nature due to trauma and some defect in capillaries. (15) Giant cell granulomas of the jaw bones may be central or peripheral. Peripheral lesion present as pedunculated or sessile lesion on the gingival while central lesions is endosteal. (16)

The clinical behavior of CGCG is variable. It ranges from slow growing, asymptomatic swelling to an aggressive lesion which manifests with pain. The most common presenting sign of CGCG is a painless swelling with noticeable facial asymmetry. Alternatively, the abnormality may be disclosed as a purely incidental finding during radiographic examination of the jaws made for an unrelated purpose palpation of the suspect bone area may elicit tenderness. Teeth in association with this lesion may become mobile but maintain vitality. (16)

Based on the history and clinical examination the following differential diagnosis was continued. Radicular cyst, the most common type of cyst in the jaws arises from teeth (may be associated with trauma) and produces no symptoms unless secondarily infected. The incidence of radicular cyst is greater in the third to sixth decades and has a male predominance. Most of them are found around maxilla, especially around the incisors and canines. All the above clinical findings in our case were in the favor of radicular cyst.

Adenomatoid odontogenic tumour is another diagnosis to be considered. It is an uncommon tumour of odontogenic origin. It mostly occurs in the second decade and has predilection for females. It is a slow growing and painless tumour, associated with missing tooth. It most frequently (70%) occurs in the maxilla in the incisor-canine-premolar region. It may cause displacement of adjacent teeth and expansion of the jaws. Adematoid odontogenic tumour can present both central and peripheral variants. In our case the swelling was not associated with embedded tooth. Hence extrafollicular variant of AOT was considered in the differential diagnosis.

Fibrous dysplasia was also considered in the differential diagnosis. The monostotic form of fibrous dysplasia most often involves the jaw where the maxilla is commonly affected. It has a predilection for females and is discovered in younger age group. It causes expansion of the affected jaw and displacement of teeth.

Calcifying epithelial odontogenic cyst (CEO C) was also considered in our differential diagnosis. It has wide age distribution at 10-19 years with a mean age of 36 years and second incidence occurs during the seventh decade. Clinically the lesion usually appears as a slow growing, painless swelling. It has nearly equal distribution between jaws. It mostly occurs anterior to first molar, especially associated with cupids and incisors. In most cases it causes expansion of bone and may destroy the cortical plate along with displacement of teeth. (7)

The radiological appearance of CGCG is variable. Usually the lesion appears as a unilocular or multilocular radiolucency. It may be well defined or ill-defined and shows variable expansion and destruction of the cortical plate. The radiological appearance of the lesion is not pathognomonic and may be confused with that of many other lesions of jaws. The final diagnosis eventually rests on histopathology because the clinical and radiological features are not specific.
Central giant cell granuloma of the jaw usually presents as a painless solitary radiolucent expansion in most of the cases. Some lesions are more destructive with a marked tendency to recur. A more aggressive type of such lesion will require more radical treatment. (10)

The recurrence rate is reported to be 13-22% with most treatment failures manifesting within the first two years of the therapy. 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 has to be done. The medical management of CGCG as an adjunct to surgery includes treatment with steroids or calcitonin which inhibits osteoclastic activity. 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. (11)

**Conclusion**

The clinical behavior of this lesion is quite variable and difficult to predict. Hence we suggest that CGCG should also be considered in the differential diagnosis of the swellings in maxillary anterior area even though it has a marked propensity to occur in the mandibular anterior area.

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