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Central Giant Cell Granuloma: A retrospective clinicopathological study

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Abstract

The Central giant cell Granuloma (CGCG) of the jaw bones is not uncommon lesion, most commonly seen in young age.

A retrospective data of fifty-five patients diagnose as CGCG has been studied from the files of patients in the Oral Pathology Department, College of Dentistry, University of Baghdad, over the period from 1980-2000. Result shows that maximum incidence of CGCG has occurred in the 2nd decade of life 37.7 percent. Male to female ratio is (1:1.4). The mandible has been involved in 67.3 percent, the premolar area represents the most common area involved in both jaws 32.6 percent. The expansion of the alveolar bone has been the most common clinical symptom 96.4 percent. The recurrence rate has been (9.1%) of the treated patients. In (47.1%) the lesion has unilocular radiolucency. This study shows that there is no site predilection for anterior occurrence of CGCG.

Introduction

The central giant cell Granuloma (CGCG) remains as one of the most controversial and lesser understood lesions in oral pathology. It has been defined by the World Health Organization (WHO) [(1)] as an intraosseous lesion consisting of cellular fibrous tissue that contains multiple foci of hemorrhage, aggregation of multinucleated giant cells, and occasionally trabeculae of woven bone.

The origin of the lesional cells is still debatable; however, commonly held ideas have included origin from macrophage/ histocytes or pluripotential mesenchymal cell[(2)].

Jaffe (1953) has separated the giant cell granuloma of the jaws from the giant cell tumor of bone on the of the basis of the perceived differences in their histologic and clinical behavior. He suggests that the giant cell granuloma is not a neoplasm but rather a reactive response to injury. Hence the term giant cell reparative granuloma has been widely adopted. However, because the clinical behavior of many of these lesions are inconsistent with

a reparative process, the word "reparative" has been deleted from the name, and today the term "central giant cell granuloma" is commonly used[3].

According to the literature, CGCG of the jaws is common lesions which account for approximately 7% of all benign tumors of the jaws, and occur at any age, but most commonly it has been seen in the first-3 decades[4,5,6].

Radiological features of CGCG vary from undefined destructive lesions to a well- defined, multilocular appearance. However, non of these features is specific for CGCG [7] .

Since this lesion is relatively not uncommon, it seems appropriate to review as many of these cases as possible. For more declaration on their pathogenesis and clinical behavior we have to analyze the information to improve our knowledge and diagnostic ability of this entity.

Material & Method

Data of fifty-five patients of CGCG were retrieved from the files of Oral Pathology Department, College of Dentistry, University of Baghdad. All tissue samples had been processed within the previous (20) years. To be considered for the study, all cases had to have arisen centrally within the jaws. Cases suspected for peripheral giant cell lesion (granuloma) were excluded from the study. The criteria for accepting cases from the files which were analyzed were the age, sex, location of the lesion, clinical presentation, histopathologic features and an acceptable detailed radiographic picture or radiologic description in the individual report. This information was tabulated.

Results

The total number of oral biopsy reports from 1980 to 2000 was (6017), of which Fifty- five cases were diagnosed as CGCG representing (0.9%).

The age and sex distribution is demonstrated in Table (1). The patients ranged in age from 7years to 72 years with a mean age of (28.4) years and a median age of (20) years. The maximum incidence of the condition was in the second decade of 20 patients life that is (37.7%). The diagnosis of (34) cases was made with most of the patients before the age of 30 years cases (64.2%). In two cases, the age was not recorded. In the (31) cases out of the (53) cases there was a light tendency of the lesion appearing in the female patients that is (58.5%) with a ratio of (1.4:1)

Table(1):Age & Sex distribution of the 53 cases of CGCG

Age group	Male	Female	Total	
0-10	4	3	7	13.2%
11-20	8	12	20	37.7%
21-30	2	5	7	13.2%
31-40	2	4	6	11.3%
41-50	1	3	4	7.6%
51-60	4	3	7	13.2%
>60	1	1	2	3.8%
Total%	22(41.5%)	31(58.5%)	53	100%

The distribution of CGCG in the mandible and maxilla is shown in Table (2). In 33 (67.3%) patients, lesions were located in the mandible, and in 16 (32.7%) patients, they were located in the maxilla, giving a mandibular to maxillary ration of 2.1:1. In 6 cases, the site distribution was not detected. The most common site in the mandible was premolar region (11 cases). For the maxilla, the incisor and premolar areas were most frequently involved (5 cases for each). However, the premolar area represents the most common region involved in both jaws by the lesions 16 cases (32.6%). In addition, (12 cases 24.5%) crossed the midline.

Table (2): Site distribution of 49 cases of CGCG

Location	Mandible	Maxilla	Total%	
Incisor+Canine	8	5	13	26.5%
Incisor+Premolar	6	1	7	14.3%
Premolar	11	5	16	32.7%
Molar	5	2	7	14.3%
Incisor+Premolar+Molar	3	3	6	12.2%
Total%	33(67.3%)	16(32.7%)	49	100%

The duration of symptoms from onset to diagnosis ranged from 2 weeks to 3 years (median 6 moths). The expansion was the most common symptom in 53 (96.4%)cases accompanied by tooth mobility in 17 (31%)cases with bleeding in 8 (14.5%)cases. Pain, parasthesia and lymph node involvement were occasionally observed. The recorded cases which recurred are 5 (9.1%)cases .Moreover, the most frequently encountered type of oral lesion was firm in consistency mass, in 30 (54.5%)cases , and in 13(23.7%) cases was soft. However, in 12 (21.18%)cases the

type of the lesion was not recorded. Table (3) displays the clinical symptoms of the CGCG.

Table (3): Clinical sign and symptoms of CGCG (55 cases)

Sign & symptoms	Number	%
Expansion	53	96.4%
Tooth mobility	17	31%
Bleeding	8	14.5%
Pain	3	5.5%
Parasthesia	3	5.5%
Lymph node involvement	1	1.8%
Recurrent	5	9.1%
Firm consistency	30	54.5%
Soft consistency	13	23.6%

The radiologic features of CGCG are demonstrated in Table(4). Excluding of one case (1.9%) because the radiographic details were not available. The lesion had a unilocular appearance in 40 (74.1%) cases, while multilocular in 14(25.9%) cases. However, in the mandible 25 (46.3%) cases the lesions were unilocularly compared with ones of 15(27.8%) cases in the maxilla. Lesions were defined as radiolucent in 48 (88.7%)cases, as radiopaque in 2 (3.7%)cases, and as mixed radiolucency/radiopacity in 4 (7.4%) cases. Furthermore, the CGCG was associated with a crown of an unerupted tooth in (2 cases 3.7%), and involve the maxillary antrum in 3 (5.5%)cases.

Table (4): Radiographic appearance of 54 cases of CGCG

jaw	Locularity		Radio-		
	Uni.	Multi.	Lucency	Opacity	mixed
Maxilla	15(27.8%)	5(9.3%)	14(25.9%)	2(3.7%)	4(7.4%)
Mandible	25(46.3%)	9(16.7%)	34(63%)	0	0
Total %	40(74.1%)	14(25.9%)	48(88.9%)	2(3.7%)	4(7.4%)

Hematoxylin and eosin stained sections revealed that the majority of the lesions exhibited a proliferation of ovoid to spindle- shaped mononuclear cell admixed with varying numbers of multinucleated giant cells. But the most cases exhibited a background of fibrous stroma. Vascularity was not

inconspicuous, and varying amount of hemosidrein pigment could be identified. An occasional focus of metaplastic bone was seen, and variable amounts of inflammation were noticed in some area too.

Discussion

Numeric data regarding clinical features, location, and radiologic appearance of jaw lesions are essential for correct diagnosis, treatment planning, and development of computer- based diagnostic system [3] .

According to the literature CGCG may occur at any age but most commonly seen in the first 3 decades. This series supports the age occurrence reported by other investigators [4, 6, 7] , that is CGCG appears most frequently in the first and second decades of life. In previous studies a significant female predominance was observed by Eisenbud et al [7] , Waldron and Shafer [8] , whereas others reported only a slight female predilection [4,5,6] . Recently Whitaker and Bouquot [2] have investigated the correlation between hormonal influence and female predominance, concluding that factors other than a direct influence of the ovarian hormones are responsible for the development and growth of CGCG. The result of this study shows that the female – male ratio has been 1.4:1, confirming that there is a reasonable female predominance.

Austin et al., [4] report that CGCG involves the mandible more frequently than the maxilla and that no predilection exists for any specific site within the jaws. Waldron and Shafer[8] report that the lesions tend to occur in the anterior portion of both jaws. In addition, they report that 21% of their cases crossed the midline. Other investigators[5,9] also report that the anterior part of the jaws is most commonly involved. In this investigation the location of the lesions within the jaws has been analyzed. The result show that 32.7% percent the lesions have been located in the premolar area, and 26.6 percent of the incisor with canine area have been involved. However, 59 percent have been observed in the posterior part of the jaws (molar and premolar). Thus CGCG should be added with relatively high priority to the differential diagnosis of unilocular or multilocular lesions in the posterior region of the jaw. Furthermore, 24.5 percent of the cases have crossed the midline, a feature that described in the past by several authors as typical for CGCG[8] . in addition, Kaffe et al., [3] report that CGCG appears in approximately (50%) in the molar, ramus, and condylar areas, which means that there is no predilection was exist for the anterior region.

Radiographically, some authors describe the lesion as a multilocular radiolucency [10] , others claim it is most frequently a multilocular radiolucency [6,11] . Cohen and Hertzanu [5] report that 50% percent of the 16 cases that they reviewed are unilocular and that 50 percent are multilocular.

Whitaker and Waldron [6] report that 61 percent are multilocular. On the other hand, Austin et al., [4] report that of the 11 cases that they evaluated, only one has a multilocular appearance. This study show that (74.1%) are unilocular, (25.9%) are multilocular. Further analysis shows that (46.3%) of the mandibular lesions were unilocular, whereas (27.8%) of the maxillary lesions are unilocular. These results are in contrast with those reported by Whitaker and Waldron [6] and Regzi and Sciubba[11] .

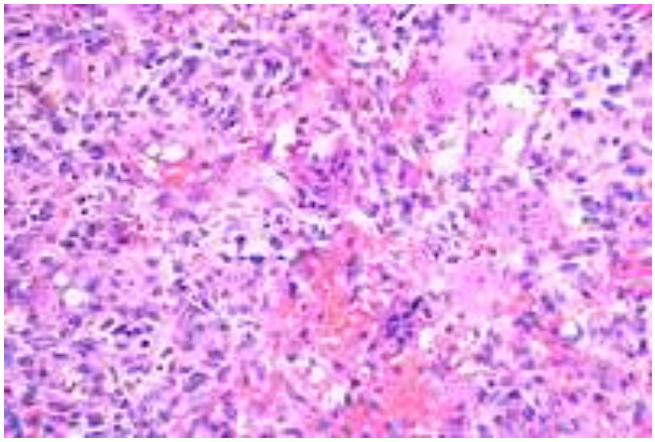
According to the literature [4,5,12] the CGCG is a slow growing lesion. Several investigators [3,7,11] report that the lesion causes tooth mobility or displacement more frequently. The finding of this study is the same, that the majority of patients (96.4%) complaining from swelling, tooth mobility (31%), bleeding, pain, and parasthesia have reported occasionally.

Despite the follow-up information has not been complete in every cases, in this study 5 cases (9.1%) of CGCG have showed recurrences after primary treatment. Similar finding was recorded by Smith et al., [13] .

Histologically, the finding of current study has confirmed that the lesion has been characterized by a fibrous connective tissue background, with scattered multinucleated giant cell and inflammatory cells. The lesions also exhibit varying amount of vascularity with spicuels of metaplastic bone [12,14,15,16] .

Surgery is the traditional and still most accepted treatment for CGCG, but it is important to bear in mind that, modern surgery can be performed in association with new approach, in an attempt to avoid recurrence [17] .

Radiographic picture of CGCG



Histopathologic picture of CGCG

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