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Central Giant Cell Granuloma of the Jaws: A Clinical and Radiographic Study in Khorasan (Iran)

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Abstract: The aim of this study was to determine demographic, clinical and radiographic features of Central Giant Cell Granuloma (CGCG) of the jaws, for the first time, in north east Iran. In this retrospective study, records of patients with definitive diagnosis of CGCG were extracted from the archive of our faculty from 2004 to 2007. The patient's age, sex, duration and clinical features of the lesions, were evaluated. Radiographs were evaluated for radiographic patterns. Of 1232 existing files in our archive (between 2004 and 2008), 18 cases were diagnosed as CGCG. The age range of our patients was between 7 to 65 years with the mean age of 21.5 years. Most of cases (61.1%) were presented in females and 7 cases in males. Most lesions were located in the mandible (83.3%). The most common finding recorded in our patients was a Painless bony expansion of the jaw. Cortical perforation and soft tissue expansion was reported in 9 cases. In most cases, a well defined multilocular radiolucency was observed in OPG, while tooth displacement was seen only in 7 cases. Although, demographic and clinical findings of patients with CGCG in our area were similar to other studies, but some differences were observed in radiographic examination.

Key words: Central giant cell granuloma, central lesion, jaws, jaw lesions, giant cell granuloma

INTRODUCTION

Central Giant Cell Granuloma (CGCG) was described by Jaffe in 1953 for the first time as an idiopathic, non neoplastic proliferative lesion (Sholapurkar *et al.*, 2008; De Lange and van der Akker, 2005; Sun *et al.*, 2009). World Health Organization (WHO) defined CGCG as an intra osseous lesion consisting of cellular fibrous tissue containing multiple foci of hemorrhage, aggregations of multinucleated giant cells and occasionally trabeculae of woven bone (Kruse-Losler *et al.*, 2006; Farrier *et al.*, 2006). Clinical behavior of CGCG varies from a slowly asymptomatic swelling to an aggressive lesion with pain, cortical perforation and root resorption (Sun *et al.*, 2009; Farrier *et al.*, 2006; Cossio *et al.*, 2007).

The CGCG of the jaws account for approximately 7% of all benign tumors of the jaws (Sun *et al.*, 2009; Kruse-Losler *et al.*, 2006). These lesions mainly occur in young adults with a predilection for females (De Lange and van der Akker, 2005; Kruse-Losler *et al.*, 2006; Regezi, 2002; Stavropoulos and Katz, 2003). The lesions must be differentiated from a variety of the jaw lesions such as cysts, odontogenic tumors, fibro-osseous lesions, vascular

malformations and even malignancies (De Lange and van der Akker, 2005; Kruse-Losler *et al.*, 2006).

In radiography a unilocular or multilocular radiolucency is observed (Kruse-Losler *et al.*, 2006; Farrier *et al.*, 2006). As this is a slow growing lesion, borders are usually well defined. Teeth displacement, root and lamina dura resorption of the teeth may also be observed (Farrier *et al.*, 2006; White and Pharoah, 2004). Small CGCG lesions may have no radiographic pattern.

The traditional treatment of CGCG is local curettage, however, aggressive subtypes of CGCG show a tendency to recurrence and required bone resection (Kruse-Losler *et al.*, 2006; Lange *et al.*, 2007). Recently, non surgical methods such as using systemic Calcitonin, Alpha interferon and intra-lesionary injection of corticosteroids have emerged (Sun *et al.*, 2009; Farrier *et al.*, 2006). The purpose of this study was to analyze the clinical and radiographic features of 18 cases of central giant cell granuloma for the first time in our province. Increasing awareness of dental practitioners about clinical and radiographic features of this lesion has an important role in the early diagnosis of CGCG.

MATERIALS AND METHODS

In this retrospective study, all the existing records in the archive of Oral Medicine Department of Mashhad Dental Faculty from 2005 to 2008 were reviewed and the records of CGCG cases were extracted. All cases with clinical diagnosis of CGCG were confirmed by diagnostic biopsy and histopathological examination performed by the same pathologist in Oral and Maxillofacial Pathology Department prior to definitive surgical treatment. Clinical and radiographic findings were analyzed focusing on age, gender, location of the lesions, signs and symptoms at presentation and radiographic findings. Data were analyzed using SPSS version 15 (SPSS Inc., Chicago, IL). Radiographs of these cases were examined in the Oral and Maxillofacial Radiology Department by the same radiologist again by using orthopantographs as a minimum standard. Cases of hyperparathyroidism were excluded by laboratory tests.

As it was a retrospective study focusing on archived medical records, it doesn't seem necessary to obtain permission from ethical committees to publish patient's information without their prior consents.

RESULTS AND DISCUSSION

During the period of this study, 18 patients with CGCG were diagnosed in our Department. The mean age at the time of diagnosis was 23.5 years and male to female ratio was 7 to 11.

Demographical information and location of the lesions are shown in Table 1. In 44.6% of our cases duration of the lesion was less than 2 months.

Clinical findings: The most common feature was an asymptomatic swelling of the face or oral cavity; while

pain was reported only by 3 patients. Tooth displacement and tooth mobility was recorded in 38.9 and 44% of patients, respectively. Hard tissue expansion was seen in 77.8% of patients (Fig. 1). Purple discoloration of mucosal surface was reported in 27.8% of cases and in 16.7% the surface was ulcerated.

Consistency of 16 lesions was hard and in 2 cases was rubbery. Clinical symptoms of patients are shown in Table 2.

Adversity of radiographic features was observed. The most common radiographic feature was multi-locular radiolucency with septations (14 cases). Root resorption was seen in 2 cases in mandible (Fig. 2). No changes in lamina dura were noticed but cortical bone destruction was observed in 2 cases.

The CGCG primarily occurs in the jaws and facial bones, though it also may appear in other areas of the body. It is an asymptomatic lesion and is usually diagnosed during routine radiographic examinations or

Table 1: Demographic features and location of the lesions

Patients No.	Sex	Age	Location
1	M	20	Mandible (posterior)
2	M	23	Mandible (posterior)
3	M	10	Mandible (posterior)
4	F	13	Mandible (anterior)
5	F	65	Mandible (anterior)
6	F	15	Mandible (anterior)
7	F	30	Mandible (posterior)
8	F	17	Mandible (anterior)
9	M	8	Mandible (anterior)
10	M	8	Mandible(anterior)
11	M	32	Maxilla (anterior)
12	F	26	Maxilla (anterior)
13	F	21	Maxilla (anterior)
14	F	20	Mandible (posterior)
15	F	8	Mandible (posterior)
16	F	46	Mandible (posterior)
17	M	7	Mandible (anterior)
18	F	55	Mandible (anterior)

Table 2: Clinical characteristics of lesions

Patients No.	Surface changes	Consistency	Tooth displacement	Tooth mobility	Swelling	Pain
1	Purple	Rubbery	+	+	+	-
2	Ulcer	Hard	-	-	+	-
3	Normal	Hard	+	+	+	-
4	Normal	Hard	-	-	+	-
5	Ulcer	Hard	-	-	+	-
6	Purple	Hard	+	-	+	-
7	Normal	Hard	+	-	-	-
8	Normal	Hard	-	+	-	+
9	Purple	Hard	-	-	+	-
10	Ulcer	Hard	-	-	+	-
11	Normal	Hard	+	+	+	+
12	Normal	Hard	-	+	+	-
13	Purple	Rubbery	+	+	-	-
14	Normal	Hard	+	+	-	-
15	Normal	Hard	-	-	+	-
16	Purple	Hard	-	-	+	-
17	Normal	Hard	-	+	+	-
18	Normal	Hard	-	-	+	+

+: Exists, -: Doesn't exist

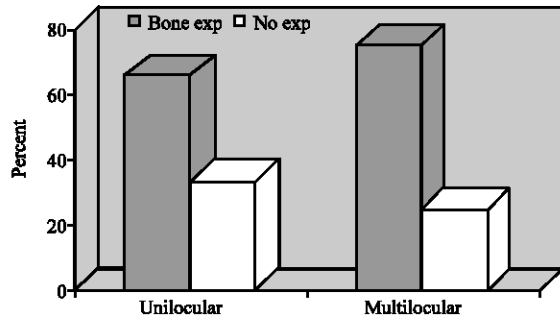


Fig. 1: Relation between bone expansion and radiographic feature

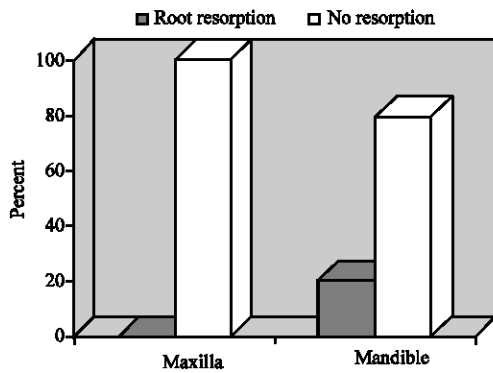


Fig. 2: Relation between root resorption and location of the lesions

when a painless expansion of the affected bone is realized by the patients or his/her parents. The developing lesions are usually painless and do not cause paresthesia; however, pain has been reported in some cases (Sun *et al.*, 2009). The CGCG may occur at any age, but there is a predilection for younger age groups (less than, 30 years old) (De Lange and van der Akker, 2005; Kruse-Losler *et al.*, 2006; Regezi, 2002). In this study, 72.2% of the lesions were found in patients younger than 30 years, which is in accordance with published reports (Sun *et al.*, 2009; Kruse-Losler *et al.*, 2006).

The CGCG occurs two times more often in mandible compared with maxilla and women are more affected than men (De Lange and van der Akker, 2005; Kruse-Losler *et al.*, 2006; Stavropoulos and Katz, 2003; Gungormus and Akgul, 2003; Cohen and Hertzanu, 1988). All of maxillary cases were located in anterior parts, but in other studies molar and premolar areas were more affected (Sun *et al.*, 2009; De Lange and van der Akker, 2005).

In female patients and in patients younger than 20 years of age CGCG was more frequent in parts of mandible (Table 1).

Clinical behavior of CGCG varies considerably. Asymptomatic swelling was the most common clinical presentation in other studies (De Lange and van der Akker, 2005; Kruse-Losler *et al.*, 2006) while pain and paresthesia were the most common symptoms in some other studies (Kruse-Losler *et al.*, 2006; Farrier *et al.*, 2006; Gungormus and Akgul, 2003).

In this study, asymptomatic swelling was the chief complaint of 77.7% cases and pain was present only in 16.6% of patients. None of our patients was asymptomatic (Table 2).

Perforation of cortical bone is typical sign for aggressive growth (Kruse-Losler *et al.*, 2006; Chuong *et al.*, 1986) and this finding was observed in 2 cases in our study. In one of these cases, tooth mobility and tooth displacement was, also, present.

Tooth mobility was observed in 8 cases and 7 cases had tooth displacement (Table 2). Pain was reported in 3 patients, one of them was accompanied by swelling. Two lesions were rubbery in consistency because of tooth mobility and displacement caused by bone destruction (Table 2). Superficial ulceration of the lesions with hard consistency seems to be the result of secondary trauma. These findings were compatible with other studies (De Lange and van der Akker, 2005; Kruse-Losler *et al.*, 2006; Whitaker and Waldron, 1993).

Radiographically, most of our cases were multilocular (77.7%) while, in other studies unilocular lesions have been observed more frequently (Kruse-Losler *et al.*, 2006). This finding was different from many studies (De Lange and van der Akker, 2005; Kruse-Losler *et al.*, 2006).

Root resorption as a sign of aggressive lesions was present in 11% of our cases that these results were similar to other studies (De Lange and van der Akker, 2005; Sun *et al.*, 2009; Lange *et al.*, 2007).

Surgery is still the most frequently applied treatment in CGCG (Sun *et al.*, 2009). The extent of surgery depends on the size and localization of the lesion and range from simple curettage to extensive resection. Treatment strategy for our cases was surgery.

CONCLUSION

Present study showed that demographic and clinical characteristics of CGCG of the jaws in our province is similar to most earlier studies. But radiographic feature is different in some aspects. The CGCG should be considered in differential diagnosis of both unilocular and multilocular radiolucencies in the jaws.

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