

Preserving of a Tooth Related with Central Giant Cell Granuloma with Non-Invasive Curettage: 7 Years Followed-Up Case Report

Fatih Mehmet Coskunes¹, Berkay Tolga Suer², Ozkan Ozgul³, Ismail Doruk Kocyigit⁴, Yasemin Kartal⁵

¹DDS PhD, Assistant Professor, Department of Oral and Maxillofacial Surgery, Kocaeli University Faculty of Dentistry, Turkey. ²DDS PhD, Assistant Professor, Department of Oral and Maxillofacial Surgery, GATA Haydarpasa Training Hospital, Turkey. ³DDS PhD, Department of Oral and Maxillofacial Surgery, Ufuk University, Turkey. ⁴DDS PhD, Associate Professor, Department of Oral and Maxillofacial Surgery, Kirikkale University Faculty of Dentistry, Turkey. ⁵Private Practice.

Abstract

Central Giant Cell Granuloma (CGCG) is defined by the World Health Organization as an intraosseous lesion consisting of cellular fibrous tissue containing multiple foci of hemorrhage, aggregations of multinucleated giant cells, and occasionally trabeculae of woven bone. An 8-year-old patient presented with painless swelling and bleeding in his upper right canine region was referred to our clinic. Incisional biopsy was confirmed that this was a CGCG. The patient was treated with non-invasive curettage and secondary intention healing. Seven-year follow-up of the patient revealed a complete resolution of the lesion and uneventful eruption of the permanent canine tooth. In this case report, a successful long-term outcome of the conservative treatment of the CGCG was presented.

Key words: Giant cell, Granuloma, Curettage, Long-term, Aesthetic

Introduction

Central giant cell granuloma (CGCG) of the jaw is benign intraosseous lesions with unknown etiology and pathogenesis [1]. The World Health Organization is defined CGCG as an intraosseous lesion consisting of cellular fibrous tissue containing multiple foci of hemorrhage, aggregations of multinucleated giant cells and occasionally, trabeculae of woven bone [2]. Giant cell lesions account for approximately 7% of all benign tumors of the jaws [3]. A painless slow growing swelling is presented in most of the cases. Displacement of tooth occurs frequently and can lead to a malocclusion [4]. The majority of the CGCG lesions are occurred in the first three decades of life with the predilection for females, however in first decade of life, it is predominantly seen in males [5,6]. The mandible is involved far more frequently (70%) than the the maxilla (30%) [7,8]. Most of the lesions in maxilla are found in anterior region [9].

There is substantial variation in the clinical behavior of CGCG lesions. CGCG lesions are classified as non-aggressive and aggressive form on the basis of clinical signs and symptoms and histological features. Non-aggressive type has a slow growth rate and thus less likely to resorbs roots and perforates the cortical plate. Aggressive type of CGCG is characterized by pain, paresthesia, root resorption, rapid growth, cortical perforation, and a high rate for recurrence after surgical curettage [4].

CGCG lesions may appear radiologically as unilocular or multilocular radiolucent areas without a distinct sclerotic margin. They can expand to 10-centimeter diameter so differential diagnosis of the lesion can be difficult. Differential diagnosis of CGCGs has to be made between wide variety of lesions from cysts and granulomas to ameloblastomas. Because of histological appearance is very similar to Brown tumor that is seen in cherubism and hyperparathyroidism, however, test for parathyroid function such as; serum calcium, phosphate

and parathyroid hormone levels, and patient demographics make the differential diagnosis usually simple.

The most widely accepted method of choice for CGCG is surgery ranging from aggressive curettage to en bloc resection. In last years, non-surgical therapeutic methods such as administration of alpha interferon, daily systemic doses of calcitonin, and intralesional injection of corticosteroids have been reported for the treatment of CGCGs.

The purpose of this study is to present the conservative treatment of CGCG lesion in the anterior maxilla of a child utilizing non-invasive surgical curettage and secondary intention healing method. Additionally, a long-term outcome of this conservative treatment is presented.

Case Report

An 8-year-old patient was referred to Department of Oral and Maxillofacial Surgery at the School of Dentistry, Ankara University. The patient's chief complaint was painless swelling and bleeding in the maxilla canine area that was present for the last 3 months. The patient's medical history revealed that he had undergone an extraction of the deciduous canine tooth (#53) 3 months ago. After the extraction, swelling of the region was occurred. According to medical history, the patient was given antibiotic and anti-inflammatory drug treatment several times by a general dentist; however, complete resolution of the swelling was not achieved (*Figure 1*). On the clinical examination, there was a swelling of the right cheek. Intraoral examination showed that the teeth neighboring the lesion were mobile and bleeding was noticed upon probing of the swelling.

On the radiological examination, orthopantomograph (OPG) showed a unilocular radiolucent lesion around an unerupted permanent canine and first premolar tooth (*Figure 2*). OPG also showed that the roots of the lateral incisor and first premolar tooth were deflected. The lesion was measured

Corresponding author: Fatih Mehmet Coskunes, DDS PhD, Assistant Professor, Department of Oral and Maxillofacial Surgery, Kocaeli University Faculty of Dentistry, Turkey; Tel: +90-2623442222; Fax: +90 (262) 344 21 09; e.mail: fcoskunes@gmail.com



Figure 1. Seven years old boy have an intra and extra osseous swelling on the left canine and premolar area of the maxilla.



Figure 2. Panoramic radiography shows unerrupted maxillary left canine and the radiolucent lesion.

2 by 3 cm in diameter between the lateral incisor and first premolar.

Incisional biopsy of the lesion was performed under local anesthesia using Articaine HCl (Ultracaine® DS Fort, Aventis Pharma, Turkey, 1:100,000 epi.). For the differential diagnosis, blood test of parathyroid hormone, calcium and phosphate were also performed. Histopathological examination of the biopsy specimen and lab result was confirmed that this was a CGCG lesion.

The patient was admitted to hospital and was placed under general anesthesia for operation. Local anesthesia of the surgical site was achieved with articain HCl (Ultracaine® DS Fort, Aventis Pharma, Turkey, 1:100,000 epi.). Mucoperiosteal flap was raised and non-invasive and controlled surgical curettage of the lesion was performed in the margins of the lesion. Extra care was taken to conserve the intact soft and hard tissues around the lesion. The part of the lesion surrounding the impacted tooth was carefully excised avoiding any iatrogenic damage to tooth. After achieving hemostasis intra-operatively, the area was left secondary healing and covered with iodine gauze. The initial CGCG diagnosis was confirmed second time by histopathological examination of the excised specimen. Histopathologic sections showed nodular mucosal tissue samples covered with squamous epithelium with partial ulceration. Subepitelial area of lesion was containing stroma composed of oval, round fibrohistiocytic cells with bleeding areas. Many of osteoclast-type giant cells were seen in stroma. Periphery of the lesion was surrounded with bone

spicules (Figure 3). Mobile lateral incisor and first premolar teeth were stabilized using orthodontic brackets and arch wire. Postoperatively surgical wound was left for secondary intention healing and gauze dressing with antibacterial pomade (Nitrofurazon 0.2 % Furacin® Soluble Dressing, Procter & Gamble Pharmaceuticals, Inc.) was placed. Dressing was changed every 24 hours for first two week of the healing period (Figure 4). After 6 months after surgery, some eruption of the permanent canine tooth toward occlusion was occurred. New bone formation and bone remodeling were also noted in the bone defect. To obtain full eruption of the permanent canine tooth, crown of the tooth was opened surgically and orthodontic bracket was bonded. Orthodontic force was applied with an elastic thread tied between the bracket and a 0.022-inch stainless steel arch wire. After 12 months of orthodontic treatment, permanent canine tooth was moved its final position in dental arch. The patient had been followed-up for seven years after initial surgery and there was not seen any clinical or radiographic recurrence (Figures 5 and 6).

Discussion

Giant cell granuloma was first identified by Jaffe in 1953. Owing to its reparative character, it was called 'reparative central giant cell granuloma'. Nowadays, the term 'reparative' has been deleted. CGCG is generally found more frequently in females than in males, with a ratio of 2:1 [9-11]. While CGCG

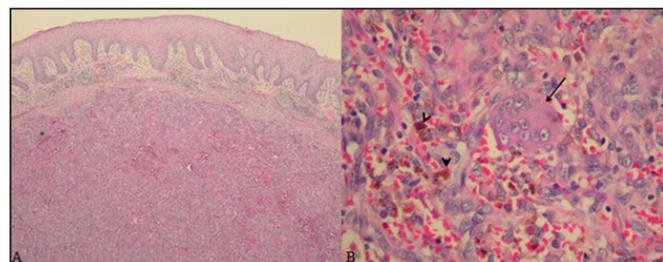


Figure 3 A: Lobulated lesion was observed beneath the oral epithelium (Hematoxylin&Eosin x40).

B: The lesion composed of numerous multinucleated giant cells (arrow), diffuse erythrocyte and hemosiderin (arrow head) in cellular fibrohistiocytic stroma (Hematoxylin &Eosin x400).



Figure 4. After surgical excision and the controlled curettage, soft and hard tissue healing was performed with sterile gauze which was renewed every 24 hours.



Figure 5. Seven years post-operative panoramic radiography shows no any recurrence.



Figure 6. Clinical view after 7 years from the surgery.

may occur at any age group, it is mostly occurred in first three decades of life and in first decade of life it occasionally occurs in males [5,6]. Radiographs of CGCG are predominantly unilocular radiolucencies in small lesions while they are multilocular radiolucencies in large lesions. The margins of the lesions are relatively well demarcated, and frequently presenting a scalloped border. However well demarcated, a sclerotic border may be absent. The clinical features of CGCGs range from painless, slow growing, asymptomatic and non-aggressive masses to aggressive painful lesions with root resorption, cortical perforation, tendency to recur after curettage, and rarely paresthesia [4-12]. Differential diagnosis of CGCGs should be included both benign lesions (e.g. aneurismal bone cyst, brown tumor of hyperparathyroidism cementifying fibroma, cherubism, ossifying fibroma, fibrous dysplasia) and malign lesions (e.g. fibrosarcoma, lymphoma, malignant fibrous histiocytoma, malignant giant cell tumor of bone, osteogenic sarcoma and giant cell tumor of bone).

Provisional diagnosis of CGCG can be made with the history of patient, clinical and radiographic investigation. However, definitive diagnosis can only be established with combination of all the above as well as histopathological and biochemical investigations [13].

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Conventional treatment modality of surgical treatment of CGCG is local aggressive curettage and the extraction of teeth that are involved in the lesion. The extent of surgery depends upon the size and the location of the lesion and varies from simple curettage to extensive resection [14]. Extent of the surgery should be judged by the evaluation of the clinical behavior and the size of the lesion. Curettage of the tumor mass was followed by removal of the surrounding peripheral margins for obtaining low recurrence rate and good prognosis. Aggressive curettage and resection of CGCGs may result both esthetic and functional defects especially in young patients. In this presented case, authors preferred a conservative curettage and kind of marsupialization due to patients' young age and the localization of the lesion. Authors of this study aimed to achieve the eruption of the permanent canine with utilizing secondary intention healing that a kind of modification to marsupialization and orthodontic therapy. The patient was followed-up closely for 7 years after the initial surgical treatment and there was no recurrence during this period.

According to literature, the recurrence rate of CGCG varies between 11-49% [9]. Whitaker and Waldron [5] reported few cases of CGCG recurred 2 years after initial operation. In large lesions, bloc resection may be necessary with the postoperative reconstructive treatment modalities such as bone grafting and free flaps. It is suggested that CGCG displaying aggressive clinical features such as cortical perforation, large lesions and root resorption have a greater tendency to recur after conservative treatment. Studies report that 72% recurrence rate for the aggressive CGCG, whereas 3% recurrence rate for non-aggressive forms of CGCG [15-17]. These data indicate that surgical curettage is suitable for the treatment of CGCG lesions of jaws without displacing aggressive clinical signs [18,19]. Recently, non-surgical treatment modalities such as local injection of corticosteroids, daily systemic application of calcitonin and corticosteroids and local applications of alpha-interferon are carried out by many clinicians. Studies suggested that conservative therapies have also good outcomes as surgical therapies [20,21].

Authors of this report think when the patient with CGCG is young; the lesion localized in the esthetic zone and associated with unerupted teeth, non-invasive curettage technique would be employed to obtain resolution of the lesion as well as eruption of the teeth involved. Application of local and systemic drugs for definitive eradication of these lesions may generate more costs and chair time for both patient and clinician. Additionally, success of these methods for the complete resolution of these lesions remains controversial to this day [22].

In this case report we described the conservative surgical treatment of young patient with CGCG of maxilla and reported the successful outcome of the long-term follow-up of this treatment. The authors of this study strongly believe that should clinician chooses conservative treatment of management for GCGC, clinician should be aware of possible recurrence of CGCG thus should place patient for close follow up.

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