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CASE REPORT

CENTRAL GIANT CELL GRANULOMA OF MANDIBLE IN A CHILD: A CASE REPORT AND REVIEW

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ABSTRACT

Central giant cell granuloma (CGCG) is an uncommon, benign, and proliferative lesion whose etiology is not defined this report is presented to provide an insight into the clinical features and radiographic features of the cyst. This report aims to assist the clinician to form an appropriate differential diagnosis and treatment plan for a cyst hereby preventing the recurrence. The representative tissue was received in 10% formalin, which measured around 1 × 1 cm in diameter. About 5 µm thick sections were obtained from paraffin-embedded tissues that had been processed and stained with routine hematoxylin and eosin. The stained sections were then reviewed. Examination of paraffin-embedded sections showed microscopically connective tissue made up of mature collagen fibers, fibroblasts and showing numerous multinucleated giant cells with foci of osseous structures thus giving a final diagnosis of Central giant cell granuloma

INTRODUCTION

Central giant cell granuloma (CGCG) was first described by Jaffe in 1953. It is an uncommon, benign and proliferative non-neoplastic process. Jaffe considered it as a locally reparative reaction of bone, which can be possibly due to either an inflammatory response, hemorrhage or local trauma.[1] Females are affected more frequently than males. Most lesions occur in the molar and premolar area, some of these extending up to the ascending ramus. The presence of giant cell granuloma in the mandibular body area, the entire ramus, condyle and coronoid represents a therapeutic challenge for the oral and maxillofacial surgeons. It occurs over a wide age range.[2] The term central giant cell lesion has been proposed as the microscopic features are not those of a true granulomatous process.[3] The purpose of this case report is to understand the diagnostic challenge that CGCG presents in the dental clinic as well as the surgical challenge in the treatment of CGCG. Herein, we report a case of a CGCG in a child who underwent surgical treatment and on postoperative follow-up shows no recurrence.

CASE REPORT

A 14 -year-old woman reported to our Department of Oral and Maxillofacial Surgery with a chief complaint of a painless swelling on the right front jaw region since 1 year. History of present illness revealed as a swelling present since 1 year and it started as peanut in size, gradually increases to the present size. Past medical, surgical and family histories were noncontributory. On general physical examination, the patient was moderately built and nourished of her age and all vital signs revealed normal.

On examination, head, hair, nose, eyes, ears and salivary glands appear normal except, the facial asymmetry. Extraoral examination revealed a diffuse swelling of 1x2 cm is observed on the right lower one-third of the face resulting in facial asymmetry. On inspection, the overlying surface of the solitary swelling appears normal with no glistening appearance. On palpation, there is no local rise of temperature, the swelling is hard, nodular and non-fluctuant, firm and painless. (Figures 1A & 1B). Intraoral examination revealed localized spheroidal swelling in the labial vestibule extending from the

midline in relation to the lower right central incisor to the first premolar posteriorly, thus obliterating the labial sulcus.

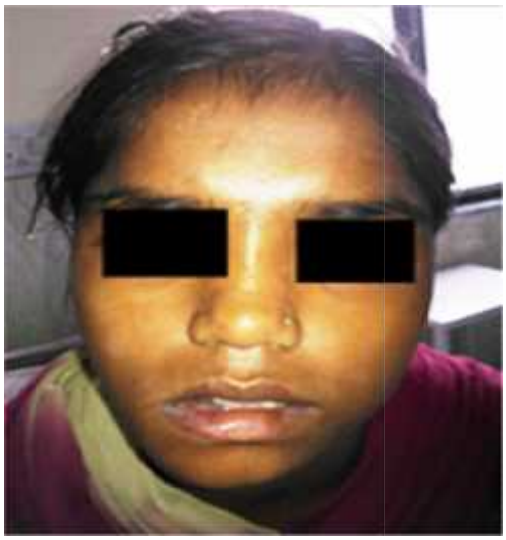

Figure 1

Overlying mucosa had a smooth surface with no evidence of fluctuation on palpation. The swelling was non-tender and hard on palpation. There was no discoloration of the associated teeth. The teeth were non-tender on percussion (Figure 2). Radiographically (i.e., Orthopantomogram (OPG) (Figure 3) the lesion was seen as a well-defined, expansile, unilocular radiolucency with varying degrees of expansion of the cortical plates occupying the para symphyseal region.

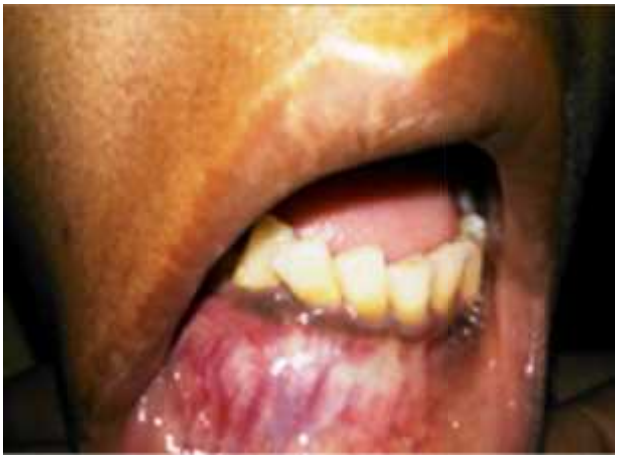

Figure 2

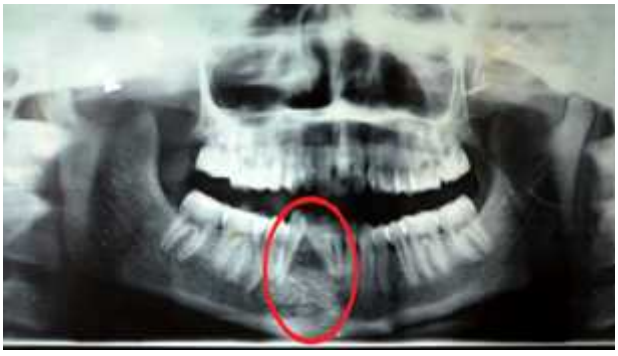

Figure 3

Radiographic appearance of the lesion is not pathognomic and may be confused with that of many other lesions of the jaws. Based on the clinical and radiological examination, a provisional diagnosis of ameloblastoma, dentigerous cyst, true giant cell lesion, odontogenic keratocyst cyst was made. Fine-needle aspiration cytology was performed which came out to be negative to confirm the diagnosis, an incisional biopsy was planned and performed under local anesthesia for H/E examination. Biopsied specimen revealed connective tissue made up of mature collagen fibers, fibroblasts and showing numerous multinucleated giant cells with foci of osseous structures (Figure 4).

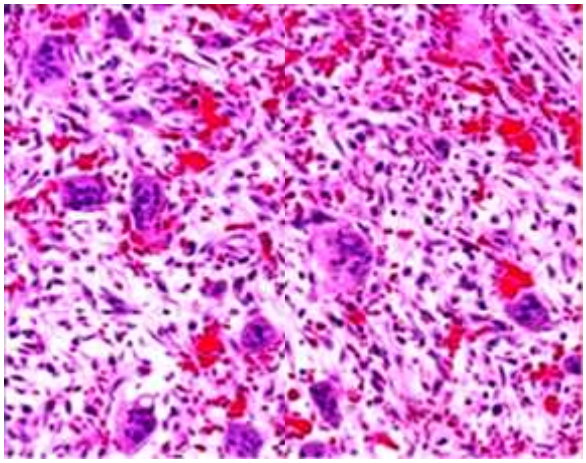

Figure 4

On the basis of histopathological and radiological findings, a diagnosis of aggressive CGCG was established. The pre-operative evaluation was performed before approaching the patient under general anesthesia. Routine hemogram and urine examination were done, which turned out to be normal.

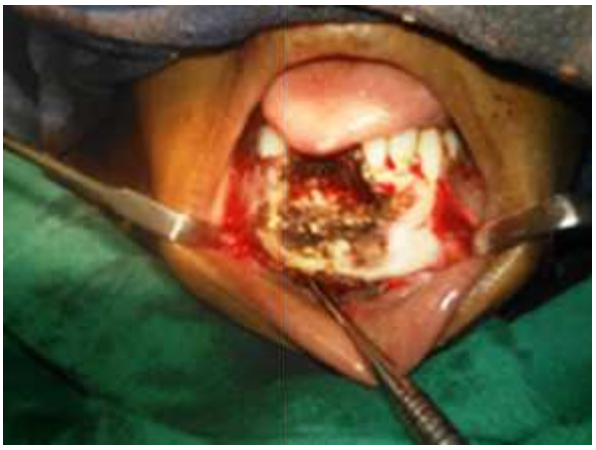

Fig 5(a)

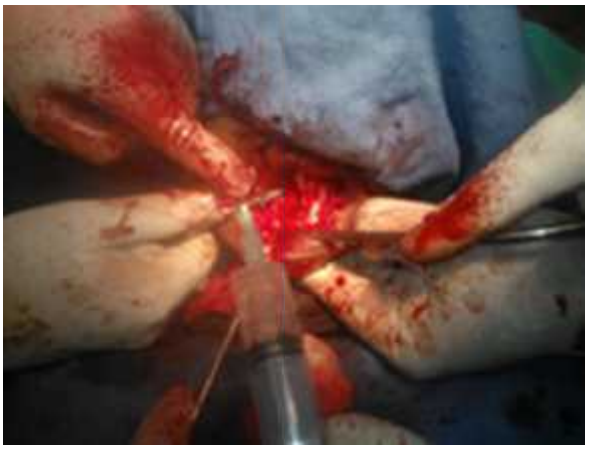

Fig 5(b)

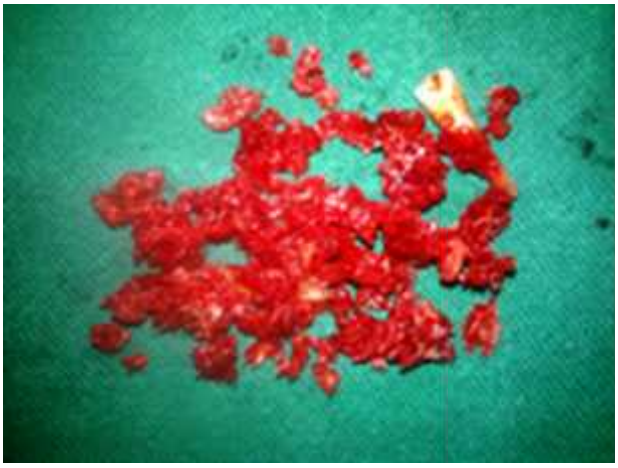

Fig 5(c)

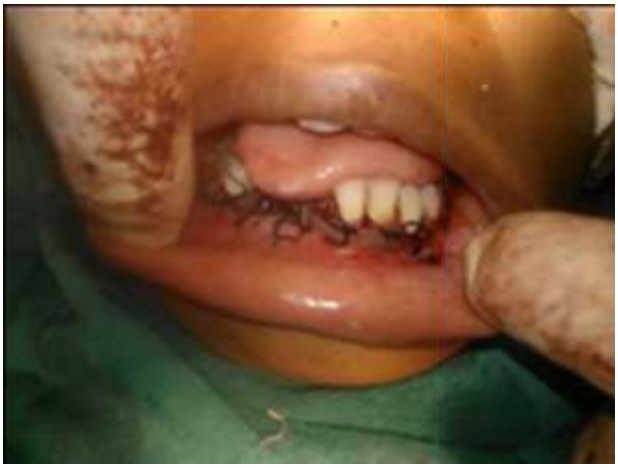

Fig 5(D)

The serum calcium, phosphorous, parathyroid hormone were also normal, thereby excluding the possibility of hyperthyroidism. The patient was put under general anesthesia and prepared for surgical curettage of the lesion. The mandible was approached by deep vestibular incision intraorally. The lesion was exposed labially(Figures 5A, 5B, 5C, and 5D). Enucleation with curettage was done with the removal of a small amount of bone surrounding the lesion peripherally. The whole lesion was excised, and reconstruction plate was placed. Followed with primary closure of the surgical site with the help of 3-0 silk suture. No signs of recurrence were found in a follow-up period of 2 years.

DISCUSSION

CGCG occurs predominantly in the jaw and facial bones, but it also appears in other parts of the body. It is usually an asymptomatic lesion discovered during routine radiographic examinations, or when the painless expansion of the affected bone is noted by the patient or parents as in this case CGCG lesions usually grow slowly, but they occasionally grow fast also.[4–6] However, it is reported that 5–11% of the lesions are painful. Although it is noted in every age group it is more common in patients below 30 years of age.[7–10] It occurs more commonly in the mandible than in the maxilla. Women are affected more frequently than men (ratio 2:1). Most mandibular lesion occurs anterior to first molars and often cross the midline. CGCG also occurs in other bones of the facial skeleton and cranial vault.[8] Thought to represent a reparative response to intrabony hemorrhage and inflammation, CGCG was once regarded as a reactive lesion. However, because of its unpredictable and occasionally aggressive behavior, and because of its possible relationship to the giant cell tumor of long bones, CGCG is best classified as a benign neoplasm. The histogenesis of CGCG of the jawbones remains controversial, as speculations are still debated regarding the possibility that it represents a reactive, an inflammatory, an infective or a neoplastic process. Another theory is the vascular hypothesis that suggests that CGCG belongs to the spectrum of the mesenchymal proliferative vascular primary jaw.[9,10] Trauma has been considered as an important aetiological factor in the initiation of this lesion. The lesions increase by the accumulation of tissue which is produced by slow, minute, condition hemorrhages of multicentric nature due to trauma and some defect in capillaries. Giant cell granulomas of the jaw bones may be central or peripheral. Peripheral lesion present as a pedunculated or sessile lesion on the gingival while central lesions are endosteal.[8] In children with mixed dentition, a pathological lesion may be the underlying cause of regular tooth mobility and exfoliation of primary teeth and can easily be overlooked, especially in cases that are accompanied by an obvious bony expansion. These causes frequently complicate the radiographic analysis, and it can delay diagnosis and aggravate the case.[5,6] It has been reported that the origin of this lesion could be triggered by trauma or inflammation. The common effects of CGCG are painless swelling that remains undetected until facial asymmetry, impaired nasal breathing, and loosening or displacement of teeth. Localized swelling is an important clinical feature. The swelling is smooth, and palpation can reveal a rubbery, elastic sensation where the bone has thinned.[11] Although the lesion is expansile and invasive, it does not usually involve the perineural sheets.[5-7,9,11] For this reason, paraesthesia is not usually observed in these patients. The clinical behavior of CGCG ranges from a slowly growing asymptomatic swelling to an aggressive lesion. Similar findings were evident in our case. When CGCG is a slow-growing lesion, it can be asymptomatic and discovered on a routine X-ray, while the rapidly expanding, aggressive variety is characterized by pain and facial swelling. These fast-growing lesions also have a high rate of recurrence. It has been reported that recurrence is usually found when the lesion perforates the cortical plates to involve the surrounding soft tissue.[11] 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.[8-12] The final diagnosis eventually rests on histopathology because the clinical and radiological features are not specific.[8]. Histologically, CGCG contains focal arrangements of giant cells within a vascular stroma with thin-walled capillaries adjacent to the giant cells. There is a spindle cell stroma which may well be the cell of origin. Similar findings were evident in our case also. The presence of foreign body type giant cell (as seen in our case and absence of stromal tumor cells differentiate CGCG from a giant cell tumor. 'Solid' aneurysmal bone cysts (ABC) are true benign neoplasms containing giant cells while trauma causing intramedullary hemorrhage has been implicated in the past in the etiology. Normal serum calcium, parathyroid hormone, alkaline phosphatase and phosphorus levels distinguish CGCG from other conditions like Brown tumor of hyperparathyroidism.[9,11] Surgery is the traditional and most

accepted form of treatment for CGCG. Relative contraindications do exist in certain medical conditions, such as diabetes mellitus, peptic ulcer, and generalized immunocompromised states.[7,9,11] Calcitonin nasal spray 200 U/spray once or twice daily was reported to be safe and effective for the treatment of CGCG. But, therapy may be complicated owing to the great amount of discomfort and the relatively long duration of treatment, with poor compliance by children. Where surgery has been conservative daily subcutaneous interferon α (3 million units/m^2 of body surface area) has been tried as an adjuvant due to its antiangiogenic properties, but significant side effects may limit its utility. A combination of interferon α and imatinib gave for 9 months has been shown to initiate regression of the lesion that continued after treatment had ceased. Bisphosphonates have also been attempted intravenously with promising results. Nevertheless, recurrences of CGCG are not uncommon and can be seen in up to 46% of cases.[9,11] Radiation treatment is contraindicated because of the potential for malignant transformation.[6,7]

CONCLUSION

The central giant cell granuloma (CGCG) is a benign, nonneoplastic lesion of jaws usually present in younger patients less than 30 years of age. Usually discovered through a radiograph as a radiolucent lesion of the mandible or maxilla. the exact etiology is unknown and still controversial. For the present case, the treatment protocol was surgical and we have not used conservative treatment. Surgery is the traditional and accepted form of treatment for CGCG which ranges from curettage to *en bloc* resection of the lesions. The present case highlights the difficulty in diagnosing and management of the CGCGs.

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