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Giant Cell Granüloma: Report of Three Cases, İncluding One Giant Case

Halil İbrahim Durmuş[1*] , Cansu Geben[1]

1.Harran University , Faculty of Dentistry , Department of Oral and Maxillofacial Surgery , Şanlıurfa , Turkiye

***Corresponding author**: Durmuş H.İ, Msc. PhD. Harran University , Faculty of Dentistry , Department of Oral and Maxillofacial Surgery , Şanlıurfa , Turkiye
E-mail: durmushibrahim@gmail.com

Abstract

Central giant cell granuloma is a rare, benign but locally aggressive bone tumor. Lesions may show slow growth or rapid progression. They are usually characterized by painless swelling, but cases of rapid and destructive growth and destruction of alveolar bone have also been reported. The etiology is unknown. The involvement of the mandible is more common than the maxilla and is more common in women. It is usually seen in childhood and young adults. Differential diagnosis is made with radicular cysts, odontogenic cysts, Brown's tumor and fibrous dysplasia. Conservative treatment options include intralesional steroids, interferon, calcitonin. Satisfactory results can be obtained with surgical treatment. In this case report, three cases of mandibular central giant cell granuloma treated surgically are presented.

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Key words: Granulom, tumor, benign.

Introduction

Giant cell granulomas occur in the jaws in two forms: central giant cell granuloma and peripheral giant cell granuloma (1). CGCG develops from bone.Peripheral giant cell granulomas are seen in the alveolar process and gingiva. Both types of lesions are often seen in children or young adults. About %65 patients are female patients (2).

Central giant cell reparative granulomas (CGCRG) are rare lesions that account for less than 7% of all benign tumors of the jaws (3). Although the etiology is unknown, it has been reported that it may be related to local trauma, a developmental disorder, an inflammatory lesion or a tumor (9,19). It is located almost exclusively in the mandibles and in areas of the jaws that usually contain teeth (4). In some cases, edentoulus has also been reported in patients (8). CGCG is 2 times more common in the mandible than in the maxilla. (5). In individuals in the first 2 decades, it tends to be seen anterior to the first molar tooth in the mandible and anterior to the canine tooth in the maxilla, whereas in older individuals it is frequently located posterior to the jaws (6).

Clinically, it may show slow and asymptomatic growth, or it may be seen as a recurrent, aggressive, painful lesion (7). CGCRG tends to widen the cortical borders of the maxilla and mandible. This widening usually occurs in an irregular or wavy pattern and may give the appearance of a double border when examined on occlusal x-ray. The bone forming the enlarged mandibular margin shows a granular structure compared to the cortical bone (6).

While lesions may be asymptomatic, in some cases, especially in lesions occurring in the maxilla, the outer cortex of the bone is destroyed instead of expanding, a domed, purplish submucosal swelling is formed in that area, and this gives the lesion a malignant appearance (3, 6).

Enucleation, curettage and in some cases (in aggressive lesions) resection can be performed (4, 6). There is a 15-20% risk of recurrence after curettage (4). Especially when conservative treatment is applied, the patient should be followed carefully against the risk of recurrence (6). The traditional method of treating CGCG is surgical removal. However, conservative treatment is also an option. CGCG has also been treated with non-surgical methods such as radiotherapy, daily systemic doses of calcitonin (24) and intralesional injection with corticosteroids.

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In this case report, three cases of mandibular central giant cell granuloma treated surgically are presented (25).

Case 1

An 8-year-old female patient was admitted to Harran University Faculty of Dentistry in March 2024 due to swelling in the anterior mandible. Physical examination revealed painless swelling on palpation. The patient had no significant medical history. An orthopantomographic film was taken for radiologic examination and showed a lesion with smooth borders, displacement and resorption of the teeth. (Fig 1) Computed tomography (CT) was obtained to further evaluate the lesion. Three-dimensional examination showed that the lesion caused expansion and constriction of the mandibular cortical bone. (Fig 2,3) After clinical and radiological examinations, the patient underwent incisional biopsy. Histopathologic examination revealed edematous connective tissue with areas of tissue and hemorrhage, fibrohistiocytic stromal cells and osteoclastic giant cells. Morphologic findings were reported to be consistent with central giant cell granuloma. Serum PTH and calcium values were requested from the patient in order to make a differential diagnosis of jaw tumors with the same histologic features as central giant cell granuloma seen in hyperparathyroidism. Normal values confirmed the biopsy result. It was decided to remove the lesion under general anesthesia.

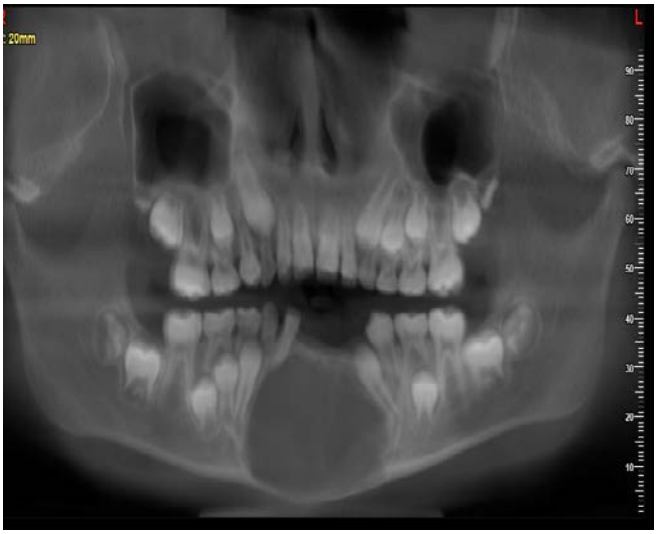

Fig 1: A large radiolucent lesion with smooth borders is observed on the pretreatment orthopantomographic film.

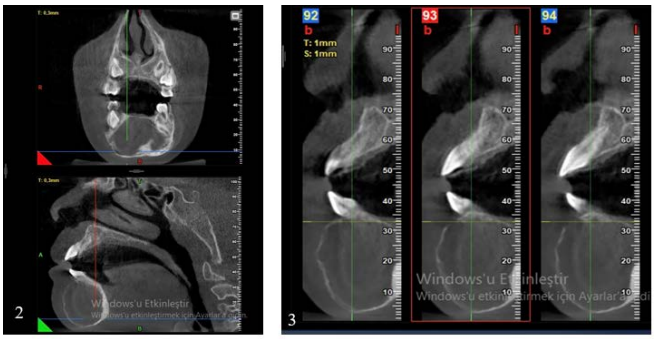

Fig 2-3: 3-dimensional computed tomography image.

It was performed through nasal intubation. In addition to the mandibular sulcular incision, a relaxing vertical incision was preferred. The flap was carefully lifted.It was reached to the anterior border of the mandible and observed that it caused expansion and destruction of the bone. After reaching the lesion center, the entire lesion was successfully removed surgically.(Fig 4) The bone walls were examined for any remaining lesions.(Fig 5) The expanded bone cortices were approximated with resorbable suture material.(Fig 6) The soft tissue was closed with 3-0 vicrly suture without tension.(Fig 7) The patient was told what to pay attention to after the operation, a soft diet was recommended and painkillers, antibiotics and mouthwash were prescribed. After 1 week, she was called for follow-up and sutures were removed.

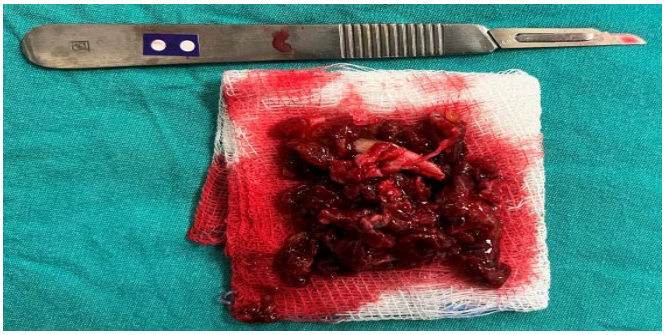

Fig 4: Surgically removed central giant cell granuloma.

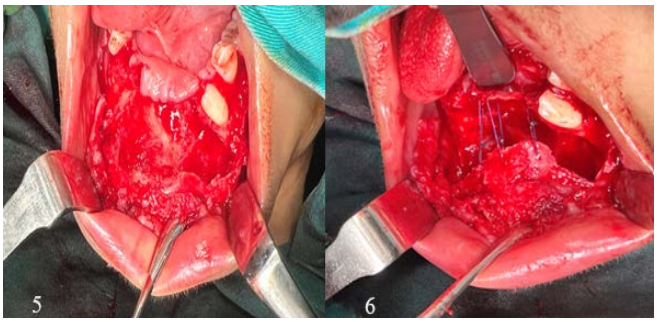

Fig 5-6: After complete removal of the lesion, the expanded bone cortices were approximated with absorbable suture material.

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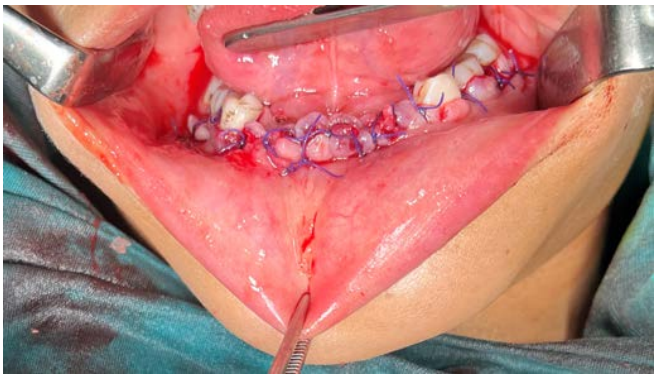

Fig 7: The soft tissue was closed with 3-0 vicrly suture without tension.

Case 2

A 12-year-old female patient was admitted to Harran University Faculty of Dentistry, Department of Oral and Maxillofacial Surgery in April 2024. On physical examination, painless swelling was detected by palpation. The patient had no significant medical history. An orthopantomographic film was taken for radiologic examination. A large radiolucent lesion with smooth borders was seen. It did not cause resorption or displacement of the teeth (Fig 8).

After clinical and radiologic examinations, excisional biopsy was performed with a preliminary diagnosis of central giant cell granuloma. Histopathologic examination revealed areas of tissue and hemorrhage in edematous connective tissue, fibrohistiocytic stromal cells and osteoclastic giant cells. These morphologic findings were consistent with central giant cell granuloma as predicted.Serum PTH and calcium values were requested from the patient in order to make a differential diagnosis of jaw tumors with the same histologic features as central giant cell granuloma seen in hyperparathyroidism. Normal values confirmed the biopsy result.The decision was made to excise the lesion using local anesthesia.In addition to the mandibular sulcular incision, a vertical relaxing incision was made.The flap was carefully lifted.The lesion's center was accessed, and it was successfully excised during the surgical procedure(Fig 9). The bone walls were examined for any remaining lesions (Fig 10). Bleeding was controlled and soft tissue was closed with 3-0 vicrly suture without tension.

The patient was told what to pay attention to after the operation, a soft diet was recommended and painkillers, antibiotics and mouthwash were prescribed. After 1 week, she was called for follow-up and sutures were removed.

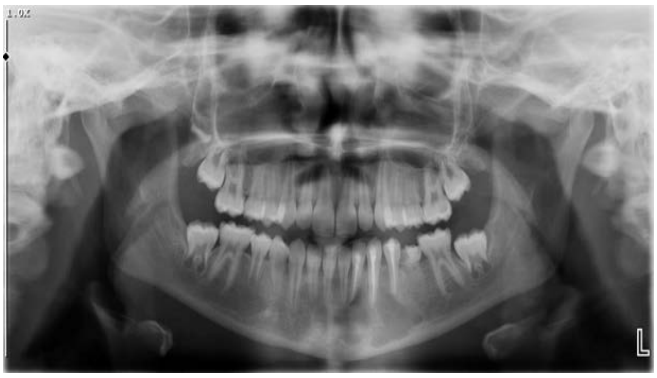

Fig 8: Pretreatment panoramic radiograph.

Fig 9: Cleaned bone from the lesion.

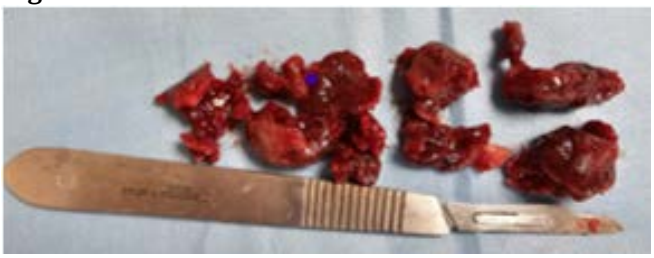

Fig 10: Surgically removed central giant cell granuloma

Case 3

A 23-year-old female patient was admitted to Harran University Faculty of Dentistry, Department of Oral and Maxillofacial Surgery in May 2024. Routine examination of the patient revealed a large radiolucent lesion with smooth borders in the anterior region of the mandible (Fig 11). On physical examination, painless swelling was detected by palpation. The patient had no significant medical history. After clinical and radiologic examinations, excisional biopsy was performed with a preliminary diagnosis of central giant cell granuloma. Histopathologic examination revealed areas of tissue and hemorrhage in edematous connective tissue, fibrohistiocytic stromal cells and osteoclastic giant cells.

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These morphologic findings were consistent with central giant cell granuloma as predicted. The decision was made to excise the lesion using local anesthetizing addition to the mandibular sulcular incision, a vertical relaxing incision was made. The flap was carefully lifted. The lesion's center was accessed, and it was successfully excised during the surgical procedure (Fig 12). The bone walls were examined for any remaining lesions (Fig 13). Bleeding was controlled and soft tissue was closed with 3-0 silk suture without tension. The patient was told what to pay attention to after the operation, a soft diet was recommended and painkillers, antibiotics and mouthwash were prescribed. After 1 week, she was called for follow-up and sutures were removed.

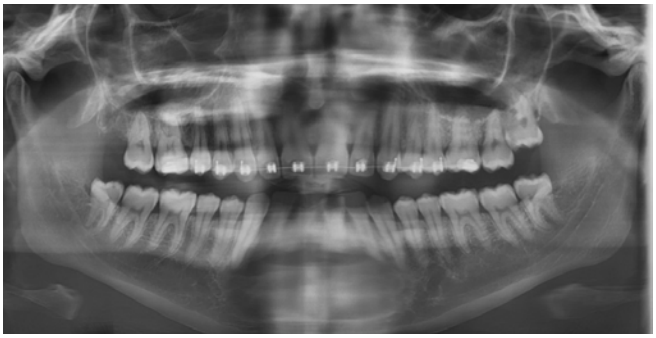

Fig 11: Pretreatment panoramic radiograph.

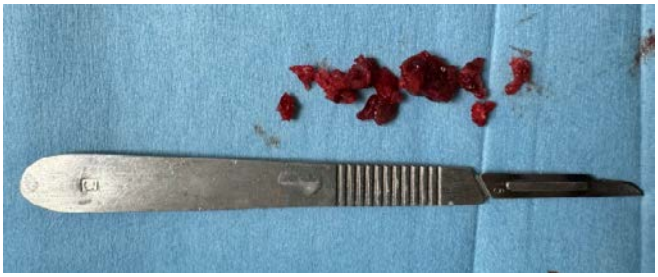

Fig 12: Surgically removed central giant cell granuloma.

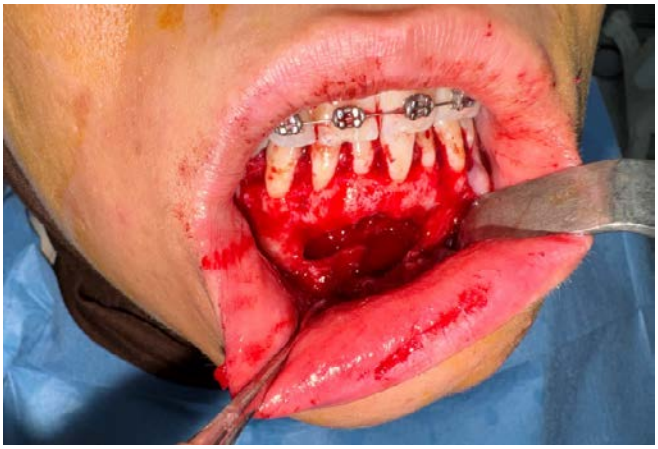

Fig 13: Cleaned bone from the lesion.

Discussion

Central giant cell granuloma (CGCG) was originally characterized by Jaffe in 1953 as a giant cell "reparative" granuloma found in the jaw bones (10).
The lesions are most often observed in children or young adults, with about 75% of all cases occurring before the age of 30, but it can occur at any age and is 2 times more common in women than in men (11).

Consistent with this information, our three cases occurred at an early age and in women.
Other than the facial bones, the small bones of the hands and feet are the most common sites where central giant cell granuloma (CGCG) can occur (12,20,21).

Central giant cell granuloma (CGCG) can present with a range of radiologic findings, including small (unilocular) lesions to large multilocular lesions, ill-defined margins, displacement of teeth and tooth germs, root resorption, and cortical enlargement or perforation (13). In our case, consistent with the rates we found in the literature review, an 8-year-old female with central giant cell granuloma was seen in the mandibular region. Cortical enlargement, tooth displacement and root resorption were found.Whitaker and Waldron published a study including 142 cases of CGCG root resorption was observed in 43% of these cases and tooth germ displacement in 36%. Multilocular lesions were detected in 60% of cases (14).

In a study by Triantafillidou K. et al. involving 17 cases of CGCG, 12 patients with lesions were reported as asymptomatic and non-aggressive, while 5 cases were characterized as aggressive due to painful, rapid growth causing tooth displacement (15).

Central giant cell granuloma has been associated with syndromes known to be of genetic origin such as Noonan syndrome, NF1 and cherubism (16). Some studies have identified chromosome translocations in giant cell tumors (GCT) associated with aneurysmal bone cysts and in long bones, which are lesions resembling giant cell granulomas. However, there remains controversy over whether chromosome abnormalities are universally observed in all giant cell lesions (17,23).

The histologic appearance of CGCG may be confused with hyporparathyroidism, Brown tumor, fibrous dysplasias, cheribusim, aneurysmal bone cyst and Paget's disease of bone. Considerations in differential diagnosis: Hyperparathyroidism is characterized by a moderate increase in serum Ca, AP and a moderate decrease in phosphorus, Paget's disease is easily differentiated because the patient with CGCG is young,

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Aneurysmal bone cyst differs in its histologic appearance with fibrous septae, blood filling the cavities and non-endothelial (18).

Conclusion

Central giant cell granulomas are more common in women and young people. They are non-neoplastic benign but rare lesions that are mostly seen in the anterior region of the mandible. There are two types of treatment, surgical or conservative.

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