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CASE REPORT

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Central Giant Cell Granuloma of the Mandible in an Elderly Patient: A Diagnostic Challenge

Samah O. Mohager[1*], Asim Saleem Almaaytah[2], Wafaey Badawy[3]

[1]*Department of Basic Medical Sciences, College of Medicine, Prince Sattam Bin Abdulaziz University, Al-Kharj, Saudi Arabia*
[2]*Department of Maxillofacial Surgery, Al-Kharj Industry Military Hospital, Al-Kharj, Saudi Arabia*
[3]*Department of Histopathology, Armed Forces Hospital, Al-Kharj. Saudi Arabia*

Abstract

Background: Central giant cell granuloma (CGCG) is a rare benign osteolytic lesion of the jaws, predominantly affecting young females. Occurrence in elderly patients is uncommon and may pose diagnostic challenges due to overlap with other giant cell lesions, particularly brown tumor of hyperparathyroidism.
Case Presentation: We report a case of a 63-year-old woman with type 1 diabetes mellitus who presented with a well-circumscribed radiolucent lesion in the left anterior mandible associated with tooth mobility. Surgical excision and curettage were performed. Histopathological examination revealed features consistent with a giant cell lesion. Comprehensive biochemical evaluation excluded hyperparathyroidism, confirming the diagnosis of non-aggressive CGCG. The postoperative course was uneventful, and follow-up imaging demonstrated satisfactory bone regeneration.
Conclusion: This case highlights the rare occurrence of CGCG in an elderly patient and emphasizes the importance of correlating clinical, radiologic, histopathologic, and biochemical findings to establish an accurate diagnosis. Conservative surgical management can achieve favorable outcomes in non-aggressive lesions. (**International Journal of Biomedicine. 2026;16(2):278-280.**)

Keywords: central giant cell granuloma • mandible • brown tumor • hyperparathyroidism

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Introduction

Central giant cell granuloma (CGCG) is a benign jaw lytic lesion that is classified into two subtypes: non-aggressive and aggressive.[1] It tends to occur in females below 30 years[2] and has a prevalence of approximately 0.0001%. The exact etiopathogenesis of this condition is not well understood; nevertheless, certain elements like intraosseous hemorrhage, inflammation, local trauma, and genetic abnormalities are thought to play roles. CGCG of the jaw is characterized by somatic mutations in *KRAS*, *FGFR1*, and *TRPV4*.[3] These mutations occur in stromal mononuclear cells, not the giant cells. Unlike giant cell tumors of bone, CGCG lacks *H3F3A* mutations.

The term "giant cell reparative granuloma" was introduced by Henry L. Jaffe in 1953 to describe a non-neoplastic, reactive lesion of the jaw resulting from intraosseous hemorrhage and trauma.[4] The condition affects the upper and lower jaws with a predilection to the region anterior to the first premolar. Clinically, it starts as an asymptomatic lesion that may later manifest symptoms.[5] Symptomatic cases show pain and paresthesia.[1] This case is reported because central giant cell granuloma rarely presents in elderly patients and closely mimics brown tumor of hyperparathyroidism, posing a significant diagnostic challenge. The case underscores the necessity of biochemical exclusion of hyperparathyroidism and demonstrates that conservative surgical management can achieve satisfactory outcomes in non-aggressive lesions in this age group. The case is reported in accordance with CARE guidelines.

Case Presentation

A 63-year-old woman with a known history of type 1 diabetes mellitus presented with a swelling in the left mandibular region, localized to the area of the lower left

canine. Clinical examination revealed a well-defined, dome-shaped 2 cm swelling associated with a mobile tooth (tooth number 33) along the superior border of the mandibular alveolar ridge. Laboratory investigations showed a glycated hemoglobin (HbA1c) level of 7.56%, with no other abnormal findings.

Panoramic dental radiography demonstrated a well-circumscribed radiolucent 0.7 × 1.5 × 2 cm lesion with expansion of the superior mandibular cortex, along with generalized alveolar bone loss consistent with chronic periodontitis. Periapical radiography of the involved tooth revealed a corresponding radiolucent lesion (Figure 1). Aspiration of the swelling was performed and was negative for malignant cells.

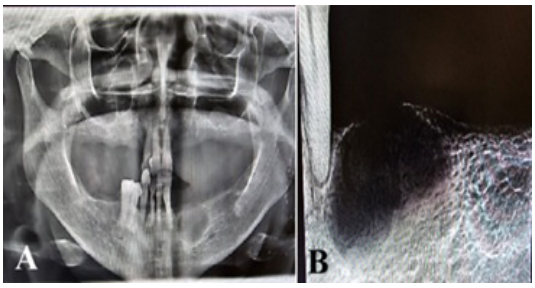

***Figure 1**. A: Panoramic X-ray; B: Periapical X-ray*

The procedure was carried out under local anesthesia using an inferior alveolar nerve block on the left side, supplemented by local infiltration of 2% lidocaine with 1:100,000 epinephrine. A mucoperiosteal flap was elevated, followed by the extraction of tooth number 33, the excision of the lesion, and the curettage of the affected area. The left mental nerve was carefully preserved. Hemostasis was achieved, and the surgical site was closed with interrupted sutures. The postoperative course was uneventful, with no reported complications.

The excised specimen was submitted for histopathological examination. Microscopic evaluation revealed an unencapsulated lesion composed of abundant fibroblasts and unevenly distributed multinucleated giant cells, with focal clustering. Areas of hemorrhage and hemosiderin deposition were also identified (Figure 2). Based on these findings, the differential diagnosis included a brown tumor related to hyperparathyroidism and central giant cell granuloma of the mandible.

Subsequent laboratory investigations were performed to exclude hyperparathyroidism, the principal mimicker. Serum calcium, phosphorus, alkaline phosphatase, and parathyroid hormone levels were all within normal limits, thereby ruling out a brown tumor.

Clinical follow-up in the outpatient setting showed satisfactory and uncomplicated healing. A periapical radiograph obtained three months postoperatively demonstrated new bone formation and a reduction in radiolucency at the surgical site (Figure 3). The patient was subsequently referred to the prosthodontics department for rehabilitation of the missing teeth.

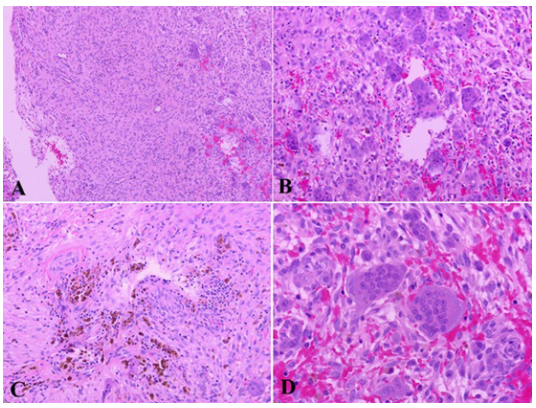

***Figure 2.** The histomorphology of the resected swelling.*

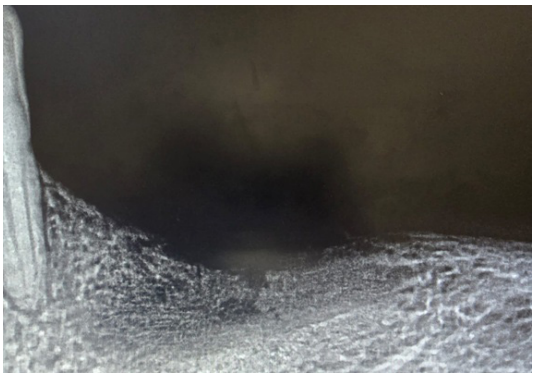

***Figure 3.** Follow-up periapical X-ray.*

Discussion

Central giant cell granuloma is a rare condition of the maxillofacial bones, with four-fifths of cases occurring in females under 20 years of age.[6] It is rarely reported after age 50.[7] The occurrence of this lesion in an older patient, as in the present case, is therefore unusual and expands the reported age spectrum of CGCG.

Central giant cell granuloma can be classified into aggressive and non-aggressive types based on lesion nature and clinical presentation. The non-aggressive type is symptomless, slowly growing, and small, causing neither root resorption nor cortical perforation. This is in contradistinction to the aggressive type, the size of which can reach more than 5 cm with possible postoperative recurrence.[1] The lesion in the current case was non-aggressive, asymptomatic, and small.

Micromorphologically, as per WHO, CGCG is composed of cellular fibrous tissue that contains multiple foci of hemorrhage, aggregations of multinucleated giant cells, and occasionally trabeculae of woven bone.[2] The present case was consistent histologically with both CGCG and brown tumor. This case underscores the importance of a systematic diagnostic approach, as a brown tumor was a strong differential diagnosis and required exclusion through comprehensive metabolic and hormonal evaluation.

Radiologically, CGCG appears as a sharply delineated radiolucent lesion extending often between the displaced

tooth roots.[8] In the current case, the lesion presented as a well-circumscribed radiolucency with cortical expansion, findings that can also mimic odontogenic cysts, benign tumors, or even malignant processes.[9] The association with tooth mobility and generalized periodontal bone loss further complicates the clinical picture and highlights the potential for CGCG to be overlooked or misdiagnosed in patients with coexisting periodontal disease.

Another noteworthy aspect of this case is the patient's history of type 1 diabetes mellitus. Although no direct causal relationship has been established between diabetes and CGCG, metabolic disorders can influence bone turnover, healing capacity, and surgical outcomes.[10] Reporting such cases contributes to the growing body of literature examining potential associations between systemic diseases and maxillofacial bone lesions, even when a definitive link cannot yet be established.

Management of CGCG depends on the lesion behavior. Treatment modalities include surgical excision or resection with continuity defects, cryotherapy, enucleation, and aggressive local curettage, either alone or combined with chemical cauterization.[6] From a therapeutic standpoint, the lesion was successfully treated by conservative surgical excision and curettage with preservation of the mental nerve and an uneventful postoperative course. This approach was favored due to the lesion's non-aggressive features, including small size, well-defined margins, and absence of cortical perforation or neurologic symptoms, as well as its anterior mandibular location. The patient's advanced age and comorbid diabetes further supported a tissue-preserving strategy. Follow-up imaging demonstrated satisfactory bone regeneration with decreasing radiolucency, confirming conservative surgery as an effective management option for non-aggressive CGCG, particularly in older patients, where more aggressive interventions may increase morbidity.

Conclusion

Central giant cell granuloma may rarely present in elderly patients and can mimic other giant cell lesions of the jaw, particularly brown tumor of hyperparathyroidism. Accurate diagnosis requires careful integration of clinical, radiologic, histopathologic, and biochemical findings. Conservative surgical management remains an effective treatment option for non-aggressive lesions, with satisfactory healing and bone regeneration.

Author Contributions

Samah O. Mohager: Data curation, Investigation, Writing – original draft.

Asim Saleem Almaaytah: Data curation, Investigation, Writing – original draft.

Wafaey Badawey: Conceptualization, Writing – review and editing.

All authors have approved the final article.

Conflicts of Interest

The authors have declared no conflict of interest.

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***Corresponding author**: Samah O. Mohager, MD. E-mail: samahmohager@gmail.com*