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CASE REPORT

# Combined management of large aggressive central giant cell granuloma of the mandible: A case report



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## KEYWORDS

Pre-operative corticosteroids;  
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**Abstract** The aim of this study is to report a case of large aggressive central giant cell granuloma (CGCG) of the mandible treated with corticosteroids and surgery. A 22-year-old male presented with painless progressive swelling in the chin region. Biopsy confirmed the diagnosis of CGCG. Management of the lesion was carried out in 3 phases. Phase-1 comprised of intra-lesional corticosteroids, phase-2 comprised of surgical management and phase-3 consisted of post-surgical intra-lesional corticosteroid. In this extensive case, although intra-lesional corticosteroid was given pre-operatively, there was no evidence of a reduction in size of the lesion both clinically and radio-graphically. This case suggests that injection of a low dose of corticosteroids pre-operatively may not be effective in such large aggressive CGCGs. Nevertheless, combined medical and surgical management is always advantageous for extensive aggressive lesions in order to reduce the size and thus minimize the need for mutilating bone resections and loss of teeth that ultimately result in functional and esthetic defects.

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## 1. Introduction

Central giant cell granuloma (CGCG) is a benign tumor that is found exclusively in the maxilla and mandible. The first description of this tumor was presented by Jaffe and recommended

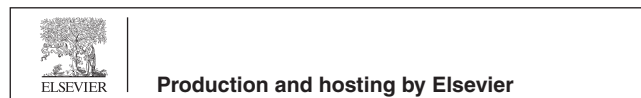
surgical management for these lesions.<sup>1</sup> The etiology of this lesion is unknown but it is assumed to occur by trauma or inflammation.<sup>2</sup> Its occasional aggressive behavior results in extensive destruction of the region affected. Radiographic presentation of these lesions is not pathognomonic and features vary from well- or ill-defined unilocular to multilocular expansile radiolucencies with or without destruction of the cortical plates.

The oldest and conventional management of these tumors is by curettage.<sup>3</sup> En-bloc resection is also a well-known modality of treatment which results in lowest recurrence rates and has been resorted as treatment of choice for locally aggressive CGCGs.<sup>4</sup> However, aggressive surgery of the jaw necessitates major reconstruction leading to morbidity in terms of function and esthetics.

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**Figure 1** Pre-op orthopantomogram (OPG).

## 2. Case report

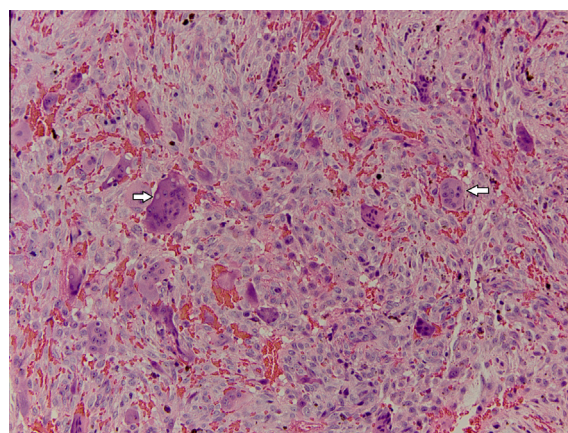
A 22-year-old male presented to our department, complaining of a painless swelling in the chin region. It was non-tender with progressive growth since one year. There was history of trauma 15 years back. The medical history was non-contributory. On extra-oral clinical examination, a large, hard, smooth and non-tender swelling was evident extending between two angles of the mandible with no evidence of lymphadenopathy. Intra-oral examination revealed a hard, non-tender vestibular swelling extending from the mandibular right molar to the left molar region with no signs of discharge. Panoramic radiography revealed large multilocular radiolucency extending between angles of the mandible (Fig. 1). Computerized tomography (CT) showed an extensive multilocular radiolucent lesion with areas of cortical bone expansion, erosion and perforations between angles of the mandible (Figs. 2 and 3). Endocrinology assessment was done to rule out hyperparathyroidism. Assays of alkaline phosphatase, parathyroid hormone, calcium and phosphorus were within the normal



**Figure 3** Pre-op CT [axial section].



**Figure 2** Pre-op 3D CT.



**Figure 4** Photomicrograph at 20× of hematoxylin- and eosin-stained slides showing multinucleated giant cells (arrows).

range. An incisional biopsy confirmed the diagnosis of CGCG. This was considered as an aggressive form of CGCG based on clinical behavior and histopathologic findings (Fig. 4).

After overall consideration of the patient's age and morbidity after the surgical management of the lesion, the options of less invasive combined therapy were discussed with the patient.

A phase-wise management protocol was initiated. In phase-1 (pre-surgical intra-lesional corticosteroids), weekly intra-lesional steroid injections (1 ml of Triamcinolone acetone (Kenacort, Piramal health care, kilitch drugs limited, India) –40 mg + 2 ml normal saline + 1 ml lidocaine HCl (2%) with epinephrine 1:100,000) were given for 6 weeks. This 40 mg in 4 ml was divided equally to 4 syringes and injected into the lesion at 4 equidistant sites. At the end of the treatment phase-1, the lesion remained the same clinically and radiographically. The phase-2 management (surgical) initiated was performed under general anesthesia (GA) after 1 month from the end of phase-1. Extraction of right impacted 3rd molar, 2nd molar and grade III mobile lower incisors, surgical curettage and decortication of the lesion was done through an intraoral approach. The lower border was left intact and the continuity of the mandible was preserved.

Finally, the phase-3 of the management protocol (postsurgical intra-lesional corticosteroids) involved 9 intra-lesional steroid injections over a period of 12 weeks of the same composition used in phase-1. However, the third phase of therapy, using the same dose of triamcinolone resulted in gradual regression of the lesion and regeneration of the osseous defect by the end of 3rd phase (Figs. 5 and 6). The patient was then referred to a prosthodontist for tooth rehabilitation. Five year clinical and radiological follow up revealed complete regeneration of the osseous defect with no signs of recurrence (Figs. 7–9).

### 3. Discussion

Management of aggressive forms of CGCGs has always been a challenging problem for oral and maxillofacial surgeons due to their high recurrence rates. The high recurrence rate of 55–62% following curettage was reported by Hutter et al.<sup>5</sup> The high recurrence rate results in repetitive and extensive surgical management with a significant functional and esthetic

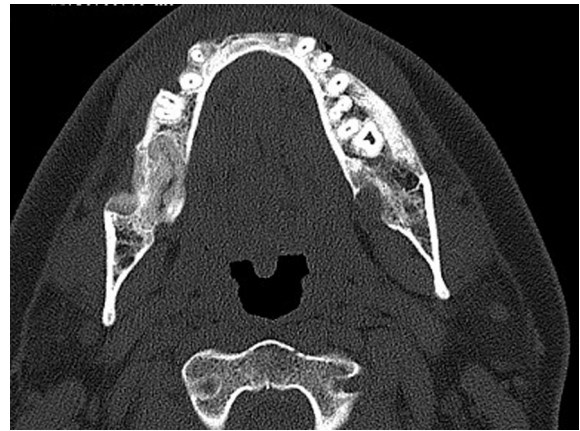


Figure 6 Post-op 6 months CT [axial section].



Figure 7 Post-op 5 years 3D CT.

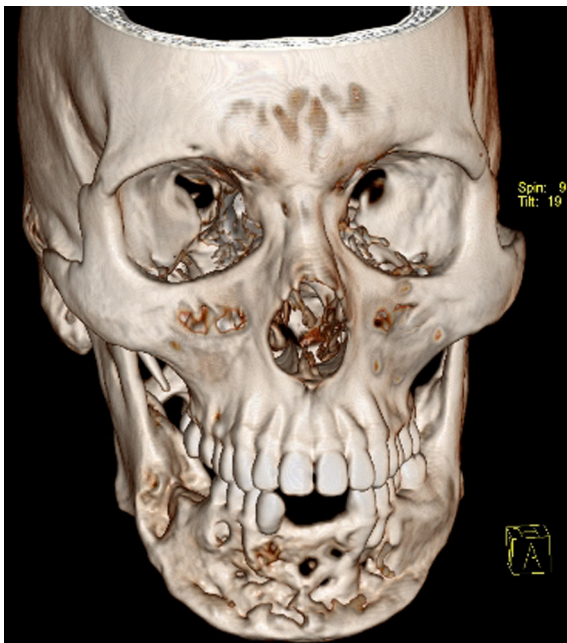


Figure 5 Post-op 6 months 3D CT.

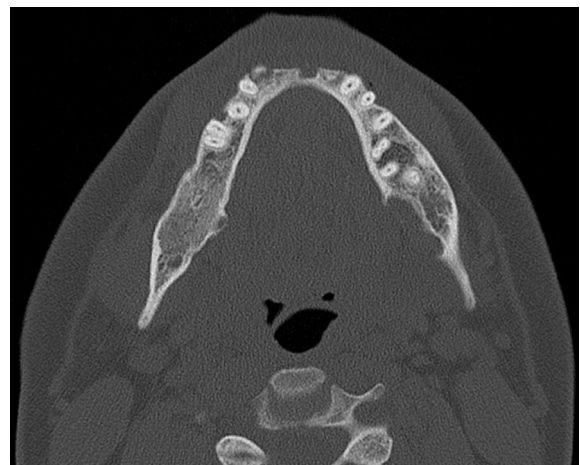


Figure 8 Post-op 5 years CT [axial section].



**Figure 9** Post-op 5 years orthopantomogram (OPG).

impairment, especially in young patients. Therefore, alternative management modalities using pharmacological agents like corticosteroids, calcitonin and systemic interferon alpha have been developed and reported with encouraging results.<sup>6</sup>

Intra-lesional corticosteroid injection as an alternative non-surgical method for managing giant cell lesions was suggested by Jacoway et al.<sup>7</sup> Studies by Flanagan et al. indicated that multinucleated cells in giant cell granulomas of the jaws are osteoclasts and dexamethasone's inhibition of osteoclast-like cells in marrow cultures support the use of intra-lesional corticosteroid for CGCG's.<sup>8</sup> Corticosteroids not only inhibit osteoclast activity but also result in rapid resolution including bone regeneration and the recovery of normal functioning.<sup>9</sup> The technique is simple, cost effective and relatively quick which avoids expressive esthetic and functional defects.<sup>10</sup> In our case, an attempt was made to check the efficacy of intra-lesional corticosteroids in such extraordinary large cases. Phase-1 management with corticosteroids was unsuccessful and lead to the initiation of phase-2 surgical management. Intra-lesional steroids could be considered as a single treatment modality in small-localized lesions, however, in the present case due to the large extent and aggressive nature of this lesion, the patient was planned for a surgical enucleation and curettage prior to which intra-lesional steroid injection was administered to decrease the lesion size which has been demonstrated earlier by Nogueira et al.<sup>11</sup>

After completion of Phase-1 (intra-lesional steroid injection), it was noticed that the response to this treatment modality was unfavorable, likely due to the thickness and cortical nature of the mandibular bone. In addition, the presence of multiple lytic cavities and extensiveness of the lesion most likely prevented the steroids to reach all planned areas especially the posterior lingual area.

At the end of phase-3, post-surgical corticosteroid therapy, the lesion began to regress radiographically at a steady pace for 6 months after the final phase with no signs of recurrence for about 5 years post operatively.

#### 4. Conclusion

In our extensive case, although intra-lesional corticosteroid was given pre-operatively, there was no evidence of reduction in size of the lesion both clinically and radiographically. This case suggests that injection of a low dose of corticosteroids preoperatively may not be effective in such large aggressive

CGCGs. Nevertheless, combined medical and surgical management is always advantageous for extensive aggressive lesions in order to reduce the size and thus minimize the need for mutilating bone resections and loss of teeth that ultimately result in functional and esthetic defects.

#### Conflict of interest

None.

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