International Journal of Oral Health Dentistry 2020;6(4):312–315

Content available at: https://www.ipinnovative.com/open-access-journals

International Journal of Oral Health Dentistry

Journal homepage: www.ijohd.org

Case Report

Non-surgical management of central giant cell granuloma with calcitonin nasal spray in an 8-year-old patient: Radiographic presentation

Amina Sultan[1,*], Ravi S Batra[2]

[1]*Dept. of Pediatric & Preventive Dentistry, Jamia Millia Islamia University, New Delhi, India*
[2]*Private Practitioner, Gurgaon, Haryana, India*

ARTICLE INFO

Article history:
Received 04-11-2020
Accepted 16-11-2020
Available online 02-01-2021

Keywords:
Bony pathology
Calcitonin nasal spray
Central giant cell granuloma (CGCG)
Enbloc resection
Management
Swellings of jaws

ABSTRACT

The central giant cell granuloma (CGCG) presents as a benign, painless, slow-growing swelling of the jaw. These lesions are reported more frequently in females and most often occur in the mandible. Radiographically, it presents as a distinct delineated bony pathology with a loss of lamina dura around teeth. There can be frequent signs of displacement of teeth and tooth germs. Currently, the usually followed surgical treatment of the CGCG ranges from simple curettage to en -bloc resection. The extensive resection of aggressive and larger lesions inevitably results in the loss of teeth and tooth germs, especially in younger patients. Since, calcitonin has a direct inhibiting effect on osteoclasts and is efficient in controlling diseases with increased osteoclast activity, such as Paget's disease, and osteoclastic bone metastases, hence serve as a promising alternative. This paper presents the effectiveness and safety of Calcitonin nasal spray, in the management of a CGCG of the jaw, in an 8-year-old patient who was given calcitonin as first-line therapy.

1. Introduction

The central giant cell granuloma (CGCG) presents as a benign, painless, slow-growing swelling of the jaw. It was first described by Jaffe in 1953, as a giant-cell reparative granuloma of the jawbones.[1] These lesions have been reported more in females and mostly occur in the mandible.[1–3]

It is an infrequently seen oral pathology with a prevalence rate of 0.00011%[1] and mostly occurs in patients in the age group of 10 to 25 years.[1,2] The etiology and pathogenesis of this entity are not clear and understandable. Reports from the dental literature recommend that the lesion may be a sequela to any past trauma or a slow configuration of fragments of recurrent giant-cell granulomas.[2]

Since CGCG exhibits indistinguishable clinical and histological findings that are consistent with the features of peripheral giant cell granuloma, necessitates a careful microscopic and radiological evaluation of the patient. CGCGs distinctively involves the resorption of the bone, and a definitive diagnosis can only be established through histopathological examination.[4] The radiographic picture of CGCG reveals an isolated radiolucent lesion with a multilocular appearance or, less commonly, a unilocular appearance. Usually, it presents as a distinct delineated bony pathology with a loss of lamina dura around teeth. There can be frequent signs of displacement of teeth and toothgerms, but resorption of teeth is rarely evident.[5]

Currently, the usually followed surgical treatment of the CGCG ranges from simple curettage to en -bloc resection. The extensive resection of aggressive and larger lesions inevitably results in the loss of teeth and tooth germs, especially in younger patients. Different non-surgical treatment options have been documented in the literature in the successful management of CGCG, such as corticosteroid injections into the lesions and radiotherapy with the recent recognition of calcitonin in dental research.[6] Since calcitonin has a direct inhibiting effect on osteoclasts and is efficient in controlling diseases with increased

* *Corresponding author*.
E-mail address: asultan@jmi.ac.in (A. Sultan).

https://doi.org/10.18231/j.ijohd.2020.064

osteoclast activity, such as Paget's disease, and osteoclastic bone metastases hence serve as a promising alternative in the management of CGCG.[1]

This paper presents the effectiveness and safety of Calcitonin nasal spray, in the management of a CGCG of the jaw, in an 8-year-old patient who was given calcitonin as first-line therapy.

2. Case Report

An eight-year-old male patient reported to the dental OPD with swelling and mild pain in the right mandibular premolar region. On examination, the swelling was bony, hard, mildly tender. The overlying skin was normal and no associated lymphadenopathy. The patient was referred for CBCT. Radiographically a well-defined, expansile unilocular lesion was noted in mandibular symphysis, right parasymphysis - body regions, extending from area of 31 till 84. The lesion showed marked expansion, thinning of adjoining mandibular labio-buccal - lingual cortices, loss of trabecular architecture and homogenous radiolucent internal structure. The radiograph scan also revealed the displacement of the developing 43, 44 tooth buds and root displacement of 83, 42, 41 & 31. The lesion measured approximately 2.2cm x 1.4cm x 2.1cm in anteroposterior, transverse and supero-inferior. A Generalized thinning and partial loss of the occlusal/incisal and proximal enamel was noted with deciduous teeth and permanent first molars.(Figures 1, 2 and 3)

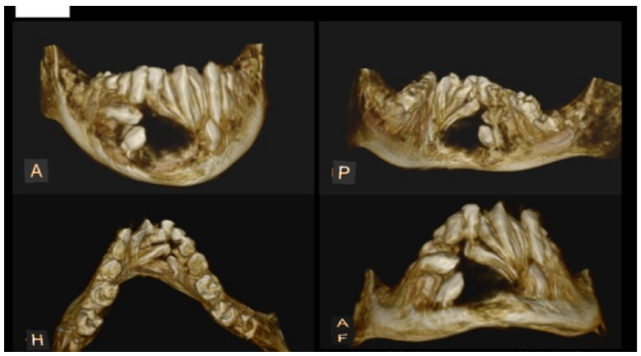

Fig. 1: Pre-operative 3D view of mandible showing the lesion with unerupted permanent teeth

Considering the age of the patient and dental status, we decided for conservative treatment. An incisional biopsy was performed to confirm the radiological diagnosis of CGCG and the calcitonin nasal therapy was planned. The patient's blood investigations revealed normal Serum calcium, parathyroid hormone, and phosphorous levels. Findings of the biopsy were corresponding with a diagnosis of CGCG. The patient was put on calcitonin nasal spray 200IU/day for three months. The patient was clinically followed up at regular intervals every month. Radiographically, the lesion had shrunk drastically within

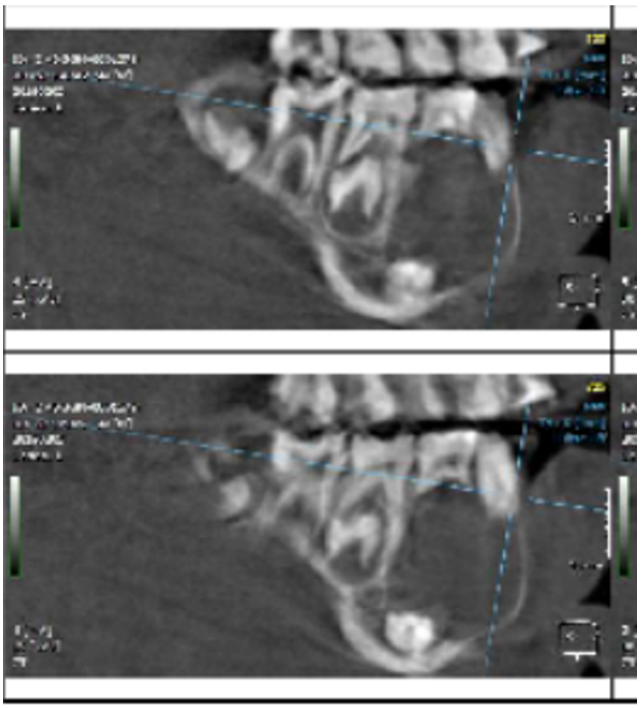

Fig. 2: Sagital section showing the extent of the lesion

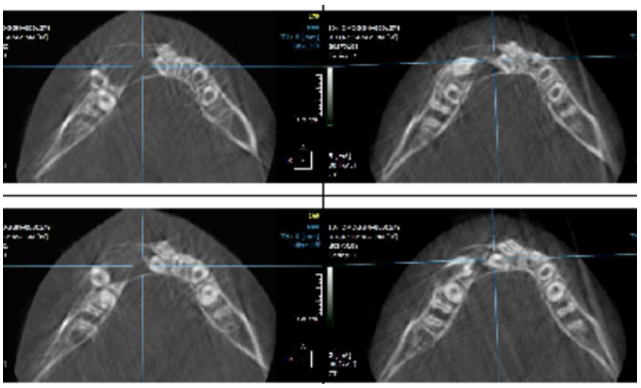

Fig. 3: Coronal section of mandible showing buccal expansion and unerupted teeth within the lesion

three months post-therapy. (Figure 4) The patient was advised to continue the Calcitonin nasal spray for another six months. Subsequent radiographic evaluations at six-months and fifteen months intervals revealed good bone consolidation. Clinical and radiological follow up had revealed a complete regeneration of the osseous defect. Also, the patient's parents were informed about the horizontal impaction of 43 and 44 and future treatment modalities. (Figures 5 and 6)

3. Discussion

Usually, Central giant cell granuloma (CGCG) is a benign pathology and only in rare cases present as an aggressive

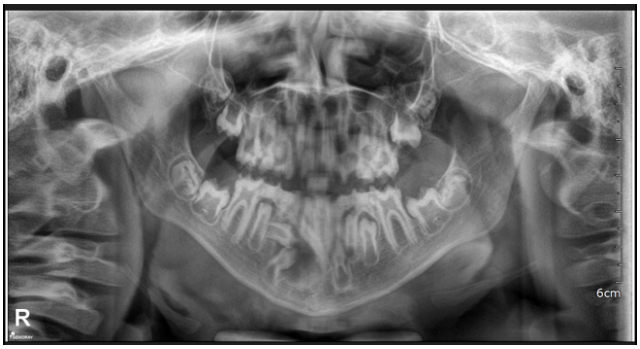

Fig. 4: Post -operative 3 months radiograph showing significant resolution and calcification of lesion and horizontal alignment of 43 &44

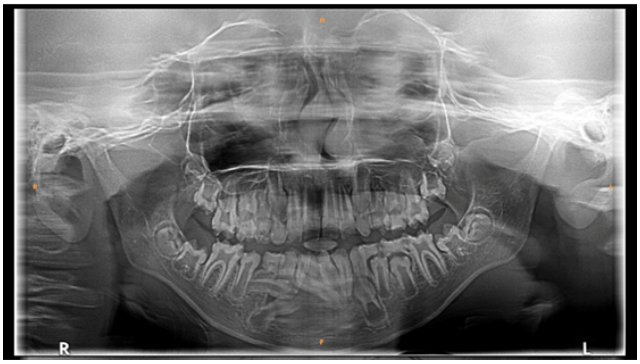

Fig. 5: OPG post-operative-6 months showing continuous improvement

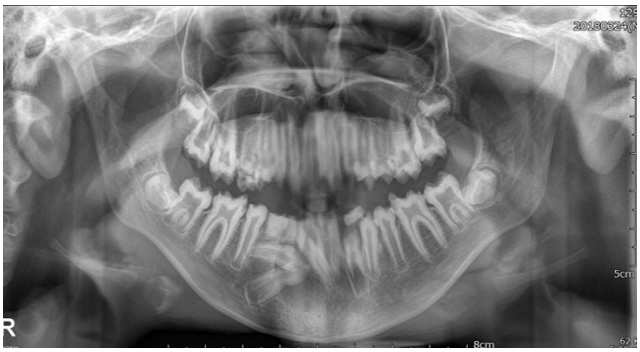

Fig. 6: OPG post-operative - 15 months with complete healing of the Lesion and horizontal impaction of 43 & 44

tumour. Although it can occur at any age, 75% of cases present before 30 years of age.[3] The usual therapy is curettage or resection. Most clinicians prefer to treat CGCG surgically recommending en bloc resection of the lesion and the uninvolved bone. However, some surgeons prefer conservative surgical treatment via simple curettage or curettage with peripheral osteotomy.[2] The surgical treatment has a disadvantage of causing facial deformity, which will be a concern in growing children with developing dentition and jaws. The recent introduction of calcitonin as a substitute therapy has shown promising results.[7] This medication can either be given in the form of daily subcutaneous injection with a dose of 50-100 IU for a period of up to 15 months or in the form of nasal spray with a higher dose of 200 IU.[8] In the present case the patient was put on calcitonin nasal spray 200IU/day and in a span of just three months showed a remarkable improvement radiologically.

The successful use of subcutaneously administered synthetic human calcitonin has been reported by several authors demonstrating complete remission of the giant cell granuloma, without signs of recurrence.[9,10] Calcitonin impedes the bone resorption action of multinucleated giant cells and triggers osteoblasts. This type of therapy was first suggested by Harris in 1993.[6] The therapeutic concept of calcitonin in the treatment of CGCC's is supported by an immunohistochemical experiment using osteoclast specific monoclonal antibodies, demonstrating that multinucleated giant cells in CGCG's are osteoclastic[3] as they exhibited all cytochemical and functional features of osteoclasts. Further in -vitro analysis revealed that calcitonin categorically inhibits the function of giant cells.[11]

The patient's cooperation is better with calcitonin therapy as it does not involve the phobia of injections. Occasionally side-effects have been reported with calcitonin treatment such as nausea, flushes, and some dizziness, shortly after the direct administration of the medicaments, and the only side-effect specifically linked to intranasal applications is sporadic nasal bleeding.[7,10]

In our patient, a nine-month period of calcitonin administration seemed to be effective and resulted in remission of the lesion. Post calcitonin administration radiological signs of the resolution and calcification were significantly evident within three months of the start of therapy. The patient compliance was good and did not complain of any side effects. Therefore, alternative treatment modality of administration of calcitonin in aggressive lesions like CGCG offers a new and theoretically promising management option, especially in young growing children.

4. Conclusion

Calcitonin nasal spray turns out to be safe and efficient means of conservative management of CGCG and might be considered a substitute to surgery especially in young growing children.

5. Source of Funding

None.

6. Conflict of Interest

The authors declare no conflict of interest.

References

1. Lange JD. Central giant cell granuloma of the jaw: epidemiology, therapy and related disorders; 2006.
2. Jaffe HL. Giant-cell reparative granuloma, traumatic bone cyst, and fibrous (fibro-osseous) dysplasia of the jawbones. *Oral Surg, Oral Med, Oral Pathol*. 1953;6(1):159–75. doi:10.1016/0030-4220(53)90151-0.
3. Pogrel MA, Regezi JA, Harris ST, Goldring SR. Calcitonin treatment for central giant cell granulomas of the mandible: report of two cases. *J Oral Maxillofac Surg*. 1999;57(7):848–53.
4. Sultan A, Siddiqui, Maryam, Juneja A. The management of an unusual case of peripheral giant cell granuloma in the maxillary region of 9 - year old dental patient. *Int J Curr Res*. 2018;10(03):67177–81.
5. Kaffe I, Ardekian L, Taicher S, Littner MM, Buchner A. Radiologic features of central giant cell granuloma of the jaws. *Oral Surg, Oral Med, Oral Pathol, Oral Radiol, Endodontol*. 1996;81(6):720–6. doi:10.1016/s1079-2104(96)80079-5.
6. Harris M. Central giant cell granulomas of the jaws regress with calcitonin therapy. *Br J Oral Maxillofac Surg*. 1993;31(2):89–94. doi:10.1016/0266-4356(93)90168-v.
7. Lange JD, Rosenberg A, Akker HPVD, Koole R, Wirds JJ, Berg HVD. Treatment of central giant cell granuloma of the jaw with calcitonin. *Int J Oral Maxillofac Surg*. 1999;28:372–8.
8. Itonaga I, Hussein I, Kudo O, Sabokbar A, Watt-Smith S, Ferguson D, et al. Cellular mechanisms of osteoclast formation and lacunar resorption in giant cell granuloma of the jaw. *J Oral Pathol Med*. 2003;32(4):224–31. doi:10.1034/j.1600-0714.2003.00069.x.
9. Stolovitzky JP, Waldron CA, McConnel FMS. Giant cell lesions of the maxilla and paranasal sinuses. *Head Neck*. 1994;16(2):143–8. doi:10.1002/hed.2880160207.
10. de Lange J, van Rijn R, van den Berg H, van den Akker H. Regression of central giant cell granuloma by a combination of imatinib and interferon: a case report. *Br J Oral Maxillofac Surg*. 2009;47(1):59–61. doi:10.1016/j.bjoms.2008.05.013.
11. Chambers TJ, Fuller K, McSheehy PMJ, Pringle JAS. The effects of calcium regulating hormones on bone resorption by isolated human osteoclastoma cells. *J Pathol*. 1985;145(4):297–305. doi:10.1002/path.1711450403.

Author biography

Amina Sultan, Professor

Ravi S Batra, Private Practitioner

Cite this article: Sultan A, Batra RS. Non-surgical management of central giant cell granuloma with calcitonin nasal spray in an 8-year-old patient: Radiographic presentation. *Int J Oral Health Dent* 2020;6(4):312-315.