Intralesional corticosteroid injections in treatment for Giant Central Cell Lesion as an alternative for a surgical approach: Case Report in an 11 year old girl

Fabio Arriola Pacheco[1,*], Jasica Ancona Alcocer[2], Maria Rodrí guez[3], Fernández[4]

[1,2,3,4]Oral Surgery Clinic, Autonomous University of Yucatan, Mérida Yucatán

***Corresponding Author:**
Email: pecuevas@correo.uady.mx

Abstract

The Giant Central Cell Lesion is a potentially aggressive intraosseous condition that appears exclusively in the upper and lower jaws, and normally in patients 30 years old, or younger. Its potentiality of causing bone and root reabsorption, and tooth displacement, make its occurrence, although rare, significant. The etiology, as well as the treatment of this lesion has been debated over the years within a scholar community that condemns surgical removal as the only potential treatment, while others report the benefits of alternative pharmacological approaches that have provided diverse results. This case study involves a giant central cell lesion that appeared in an 11 year old girl who initially reported having suffered mandibular trauma. The patient underwent a treatment with intralesional corticosteroid injections (triamcinolone acetonide) during 6 sessions, over an eight month period. The patient was monitored during a 2 year period; subsequent X-ray monitoring revealed that the lesion dissipated. The results of this study showed that the use of intralesional corticosteroids is a non-invasive alternative to surgery, especially in connection to the type of patients that normally present this condition.

Introduction

The Giant Central Cell Lesion (GCCL) is a low incidence benign lesion, representing 7% of all benign lesions of the jaws.(1) The locally aggressive behavior of GCCL is associated with destructive expansion, and is comparable to that of a malignant neoplasm.(1,2) The World Health Organization defines it as an intraosseous lesion formed by fibrous tissue that contains multiple hemorrhage sites, with the presence of giant central multinucleated cells and sometimes osseous tissue trabeculae.(3)

GCCL can appear at any age; nevertheless it normally appears during or before or during the third decade of life, and has an incidence ratio of almost as twice for women than for men. It´s mainly found in the lower jaw, towards the middle line, and it is rarely observed close to the condyles. When it does appear in the upper jaw, it can extend to neighboring structures like the maxillary sinus, the orbit, and the nasal cavity.(4)

From a clinical perspective, an indurated prominence of fast growth can be observed, which symptoms can include: pain and paresthesia of affected and neighboring areas, bone and root reabsorption, as well as tooth displacement. Unilocular or multilocular radiolucid images with well-defined margins (that may contain the osseous trabeculae) can be observed radiographically. Different degrees of expansion can also be identified. This expansion can lead to the thinning of the osseous corticals with a potential perforation involving the surrounding soft tissues.(5) GCCL is to be differentiated from similar radiolucent conditions such as the ameloblastoma, the myxoma, aneurysmal bone cyst, among other less reported pathologies.(6)

From a histological approach, cellular fibrous tissue composed of mononuclear spindle-shaped cells is present. There is also extreme vascularization, and the existence of extravasated erythrocytes with hemosiderin deposits around potential hemorrhage sites.(7,8) Due to the histopathological similarities among pathologies such as the brown tumor that accompanies hyperpharathyrodism, the aneurysmal bone cyst, and cherubism, differences with GCCL should be taken into account at the time of establishing a diagnostic.(8)

The most commonly used approach to treat this lesion is surgery which goes from a simple curettage, cryosurgery, surgical resection with peripheral osteotomy, to segmental resection with a post-reconstruction of the remaining defect. However, over a number of years multiple alternative and conservative treatments have been suggested. The use of intralesional corticosteroids, calcitonin injections, α-interferons, and receptor activator of nuclear factor kappa-B ligand (RANKL) have all shown a wide variety of results, being the intralesional corticosteroids treatment the one with most positive results reported.(8,9,10) The aim of this case is to present the results of an intralesional treatment of the GCCL, showing how this alternative can provide acceptable results without the need of an invasive surgical intervention.

Case Report

An 11 year old female patient was referred to the Department of Oral Surgery at the Faculty of Dentistry of the Autonomous University of Yucatan; she suffered from pain in the lower jaw region that spread from the chin region and continued to the left side of the face. When questioned, the patient mentioned mandibular trauma six months prior to the date of arrival to the

clinic. Initial signs of the trauma included abnormal "tickling" and subsequent mild pain.

Intraoral examination revealed a protuberance in the chin region. Palpation revealed an indurated mass, covered by a red-blue colored mucous membrane extending over the left and right canine areas. The volume of the cavity floor (below the tongue) revealed an increase of twice as much its normal size, a condition that caused tongue protrusion (Fig. 1).

Fig. 1: Initial Cavity Floor

Panoramic radiographs, as well as a CT scan were taken to confirm the presumptive diagnostic. The first procedure exposed a radiolucent zone with a well-defined margin that extended from the right canine region to the first left deciduous molar. The CT scan confirmed an osteolytic expansion that caused the displacement of several teeth. These radiographic images also revealed the displacement of various teeth of the anterior-inferior sector, and the obstruction of the eruption of the lower left permanent canine (Fig. 2-5).

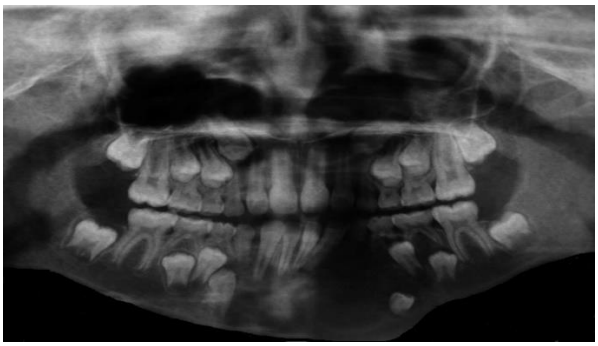

Fig. 2: Initial Orthopantomography

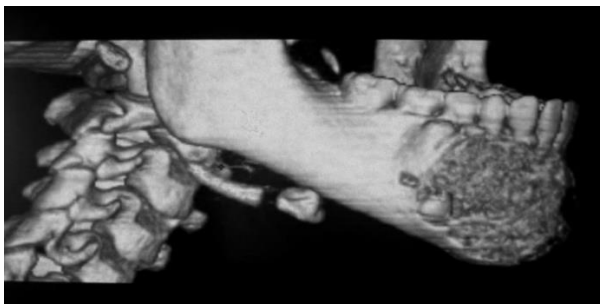

Fig. 3: Initial 3D Side View

Fig. 4: Initial 3D Frontal View

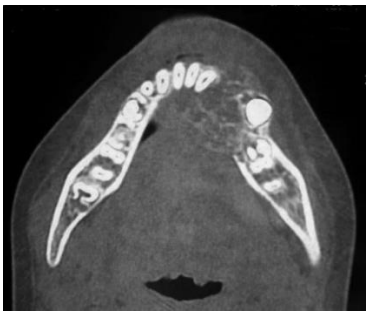

Fig. 5: Initial CT Scan

Furthermore, an incisional biopsy revealed giant multinucleated cells, with osseous trabecules, as well as muscular tissue of normal aspect, therefore confirming the GCCL diagnostic (Fig. 6).

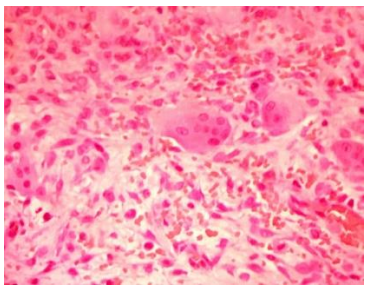

Fig. 6: Histological Study

Treatment consisted of corticosteroid injections with Kenalog 40 mg/mL (Bristol-Myer Squibb Company, Princeton NJ, USA) [triamcinolone acetonide injectable suspension] and 2% lidocaine (1.8 mL) with epinephrine (1:100 000 dilution). Injections were administered via a needle (21 gauge, 1.2 inch) in six sessions during eight months. The lesion progressively showed signs of reduction three months after the original injections had been administered.

Radiographic and CT tests were run after the completion of six sessions of treatment (Fig. 7). These tests revealed that a small area of the lesion had been trapped inside the new bone formation. Therefore, the patient underwent an aesthetic bone remodeling surgery, in addition to receiving an extra injection of corticosteroids in those areas with lesion remnants.

Fig. 7: 6 Session Control Orthopantomography

Patient was subsequently monitored in the months after to observe radiographic behavior. A final check-up two years after the initial treatment revealed complete normality in radiopacity (therefore indicating normal bone density) in the previously affected jaw area, confirming the success of the treatment (Fig. 8-12). Once the patient was cleared from the surgery clinic, she was referred to the orthodontic clinic where she is currently being treated for an anterior cross-bite, class III malocclusion, and crowding in affected areas.

Fig. 8: Final Orthopantomography

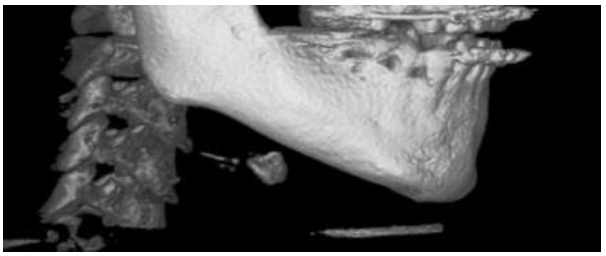

Fig. 9: Final 3D Side View

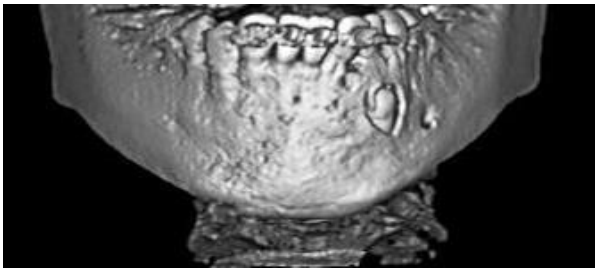

Fig. 10: Final 3D Frontal View

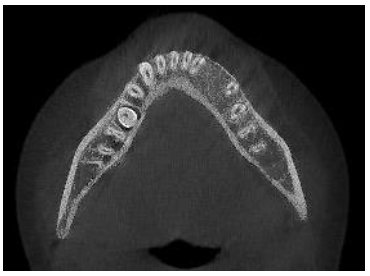

Fig. 11: Final CT Scan

Fig. 12: Final Cavity Floor

Discussion

The etiology of the GCCL is a topic that sparks academic debate. Its neoplastic-like and reactive nature leaves room for discussion concerning its true origin.[4,8] The treatment also presents multiple factors to be taken into account (extension, location, lesion aggressiveness, and systemic state of the patient) that will determine the success or failure.[4,11,12,13] The surgical approach is still widely popular, and poses a more aggressive-type treatment.[4,11]

According to the literature, the fastest and most effective treatment of GCCL wounds has involved corticosteroid injections.[14,15,16,17] The use of corticosteroids stop bone reabsorption through inhibition of lysosomal protein production by the giant cells, apoptosis induction of the osteoclastic-like cells, and an inhibition of the transcription factors.[4,15] Where apoptosis increase is present, Triamcoline acetonide inhibits, specifically, osteoclast in bone reabsorption conditions.[16]

In a study with 43 cases Jacoway et. al. reported intralesional infiltrations with cortiscosteroids as a non-surgical alternative to the treatment of GCCL. The number of infiltrations ranged between 2 and 20, with a 1-3 week interval between each infiltration.[18] When the quantity of the corticosteroid needed and the frequency in which it is administered has been modified, results have been, in general, positive.[4,5,18] The present study modified the original protocol due to the difficulty it was to obtain the drug, as it is not sold nationally. In the present study, the difficulty to acquire the drug posed a challenge to modify the administration frequency. Even though the protocol was modified due to the noted circumstances, the treatment was successful.

In those cases in which there is a recurrence of lesions, Kurtz et. al.[20] reported the need for surgical intervention; when corticorsteroids treatment has been

administered surgery is less likely to be less aggressive than it would have been without corticorstroids. We were successfully able to control the lesion without the need of invasive surgical intervention. The only intervention needed was to aesthetically remodel the bone, as well as the administration of an extra dosage of the corticosteroid; modification of the original protocol that resulted positive.

Conclusion

A pharmaceutical approach to the treatment of the GCCL is beneficial to patients because it develops into functional and aesthetic affects in the long run; when compared to a surgical (more invasive) approach. The relevant advantages of this treatment are: the procedure's mild invasive nature, the accessible cost and reduction of risks vis-a-vis a surgical approach, and, when and if needed, the possibility of post-treatment aesthetic bone remodeling. These are all important factors to take into account, especially in young, still-in-growth and development patients, like the one presented in this case. Two potential disadvantages of this treatment include the protracted nature of the procedure and probable systemic secondary effects associated to the use of corticosteroids. An affordable and less invasive treatment like this one presents itself like an important treatment option in developing countries. We believe the scientific community needs to look more into the benefits of choosing this as the definite treatment.

References

1. Morey M, Hamdam H, Caubet J, Forteza-Rey B, Iriarte JI. Granuloma central de células gigantes en paciente de edad avanzada. Rev. Esp Cir Oral Maxilofac. 2001;23(5):302-305.
2. Austin LT Jr, Dahlin DC, Royer RQ. Giant-cell reparative granuloma and related conditions affecting the jaw bones. Oral Surg Oral Med Oral Pathol 1959;12:1285–95.
3. Fernández M, Fernández J, Costas A, Sandoval J, López A. Tratamiento quirúrgico del granuloma central de células gigantes: estudio y seguimiento de 10 casos. Revisión de la literatura. Rev Esp Cir Oral Maxilofac. 2011;33(1):1-8.
4. Oliveira L, Lehman L, Gómez R, Castro W. Intralesional injection of corticosteroid for treatment of central giant cell lesions: case report and literature review. Oral Surgery. 2015.
5. Farrier L, Farrier JN, Smart MK, Nash ES. A 10-year review of the occurrence and treatment of central giant cell granulomas, in a District General Hospital. J Oral Pathol Med 2006;35:332-337.
6. Sapp JP, Eversole LR y Wysocki P Patología Oral y Maxilofacial Contemporánea, J. 2ª Ed. Hartcourt, 2004;111:113.
7. Geoffrey S, Cohn S, Parkins D. Central Giant Cell Granuloma. Australian Endodontic Journal. 2002;28(1):18-23.
8. Progel, MA. The diagnosis and management of giant cell lesions of the jaws. Annals of Maxillofacial Surgery 2012;2.
9. Jonas B. Intravitreal triamcinolone acetonide for treatment of intraocular oedematous and neovascular diseases. Acta Ophthalmol. Scand. 2006; 83:645-663.
10. Khafif A, Krempl G, Medina J. Treatment of Giant Cell Granuloma of the maxilla with intralesional injection of steroids. 2000 Dec;22(8):822-5.
11. Abdo EN, Alves LC, Rodrigues AS, et al. Treatment of a central giant cell granuloma with intralesional corticosteroid. J Oral Maxillofac Surg 2005;43:74–6.
12. Seldon HS. Central giant cell granuloma a troublesome lesion. J Endod 2000;26:371–3.
13. Harris M. Central giant cell granulomas of the jaws regress with calcitonin therapy. Br J Oral Maxillofac Surg 2002;31:89–94.
14. Pogrel AM. Calcitonin therapy for central giant cell granuloma. J Oral Maxillofac Surg 2003;61:649–53.
15. Kermer C, Millesi W, Watzke IM. Local injections of corticosteroids for central giant cell granuloma. A case report. Int J Oral Maxillofac Surg 1994;23:366–8.
16. Carlos R, Sedano HO. Intralesional corticosteroids as an alternative treatment for central giant cell granuloma. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2002;93:161–6.
17. Sezer B, Koyuncu B, Gomel M, Gunbay T. Intralesional corticosteroid injection for central giant cell granuloma: a case report and review of the literature. Turk J Pediatr 2008;47:75–81.
18. Jacoway JR, Howell FV, Terry BC. Central giant cell granuloma. An alternative to surgical therapy [abstract]. Oral Surg Oral Med Oral Pathol 1988;66:572.
19. Garza-Muñoz C, Pérez Barba G, Flores García R, De la Peña Castillo M, Velázquez Martínez J. Granuloma Central de Células Gigantes: tratamiento combinado intralesional con corticoesteroides. Rev ADM. Mar.-Abr 2010;68(2):78-82.
20. Kurtz M, Mesa M, Alberto P. Treatment of central giant cell lesion of the mandible with intralesional glucocorticosteroids. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2001;91:636–7.