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

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Abstract

The Giant Central Cell Lesion (GCCL) is a low incidence benign lesion, representing 7% of all benign lesions of the jaws. The locally aggressive behavior of GCCL is associated with destructive expansion, and is comparable to that of a malignant neoplasm. 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.

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.

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. Due to the histopathological similarities among pathologies such as the brown tumor that accompanies hyperparathyroidism, the aneurysmal bone cyst, and cherubism, differences with GCCL should be taken into account at the time of establishing a diagnostic.

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. 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
Intralesional corticosteroid injections in treatment for Giant Central….

Fig. 1: Initial Cavity Floor

Fig. 4: Initial 3D Frontal View

Fig. 5: Initial CT Scan

Fig. 6: Histological Study

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

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. 7: Final CT Scan

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.
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.

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. 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. The surgical approach is still widely popular, and poses a more aggressive-type treatment.

According to the literature, the fastest and most effective treatment of GCCL wounds has involved corticosteroid injections. 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. Where apoptosis increase is present, Triamcoline acetonide inhibits, specifically, osteoclast in bone reabsorption conditions.

In a study with 43 cases Jacoway et. al. reported intralesional infiltrations with corticosteroids 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. When the quantity of the corticosteroid needed and the frequency in which it is administered has been modified, results have been, in general, positive. 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. reported the need for surgical intervention; when corticosteroids treatment has been administered surgery is less likely to be less aggressive.
than it would have been without corticosteroids. 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 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