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Case Report

Large Central Giant Cell Granuloma in a Pediatric Patient Treated by Surgical Exeresis: Case Report

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Abstract

Central giant cell granuloma is a benign osteolytic lesion of the maxillary bones, whose behavior is variable. It can present with slow and asymptomatic growth or it can be aggressive and destructive. It usually affects a young population, most often before the age of 30 years. The etiology is uncertain, but trauma can cause intraosseous hemorrhage and the development of the lesion. The purpose of this article is to present a case of a central giant cell granuloma that affected a 4-year-old male patient, in whom surgical treatment was instituted under general anesthesia. The clinical, radiographic, and histopathological features; incidence and frequency; etiopathogenesis; differential diagnosis; and treatment modalities were discussed.

Keywords: *Central Giant Cell Granuloma; Oral Diagnosis; Oral Pathology; Benign Non-Odontogenic Tumors; Pediatric Dentistry*

Introduction

Despite being a benign lesion, the central giant cell granuloma is an osteolytic lesion of the maxillary bones. The nature and behavior of the lesion are variable, and it can present with slow and asymptomatic growth or be potentially aggressive and destructive [1-6]. The etiology is still uncertain, although it is most likely due to trauma, which is not always referenced in the patient's history, causing intraosseous hemorrhage. The body's response is exaggerated and produces a highly vascularized granulation tissue. It was previously called "giant cell reparative granuloma". However, this term has been abandoned, as the nature of the lesion is destructive and not reparative [1,2,7].

It affects the younger population, usually before the age of 30 years, and mainly in the pediatric population, with slight female predominance [1,6].

Several therapeutic methods can be employed in its management. Recently, intralesional applications of several substances have been used, such as corticosteroids, calcitonin, triamcinolone, denosumab and systemic interferon. However, surgical excision, by means of enucleation, curettage, or segmental resection is the most commonly used form. The recurrence rate is still relatively high and is determined by failures in curettage and removal of the lesion [1-6,8-12].

The purpose of this article is to present a case of a central giant cell granuloma that affected a 4-year-old male patient, in whom surgical treatment was instituted under general anesthesia.

Case Report

An African-descendent male patient, 4 years-old, presented with his parents to the Dental Service of Medical School Clinics

Hospital of São Paulo University, with a mouth lesion. Clinically, a large tumoral mass was observed in the symphyseal region; of approximately 40 mm; resistant to palpation; pinkish color, but with erythematous areas, resulting from occlusal trauma (Figure 1).

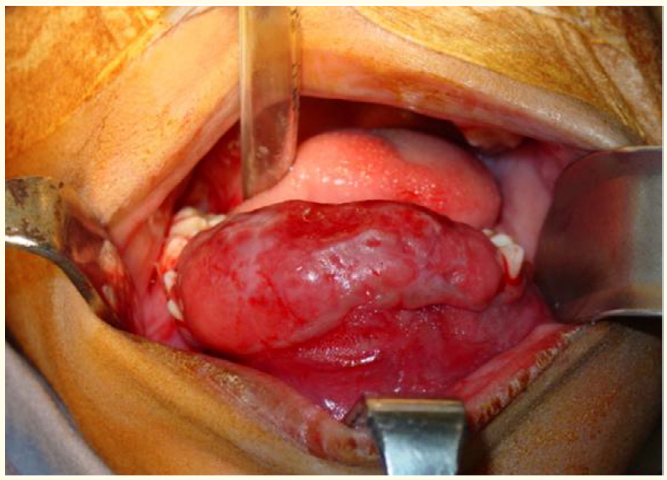

Figure 1: Pre-operative clinical aspect: a large tumoral mass observed in the symphyseal region.

Computed tomography showed a unilocular intraosseous hypodense lesion with an osteolytic aspect, coated by a hyperdense image characterizing the buccal cortical bone wall (Figure 2).

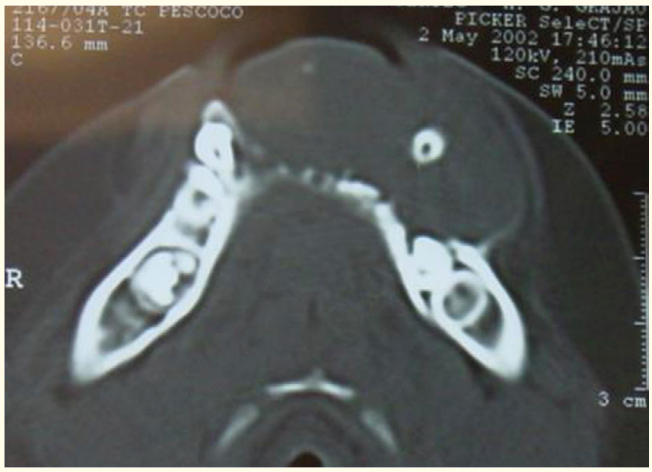

Figure 2: CT showed a unilocular intraosseous hypodense lesion with an osteolytic aspect.

Surgical excision was indicated. After exhaustive information and parental consent, surgery was planned and scheduled. Under general anesthesia, an incision was made at the mandibular base of the lesion (fornix) in the symphyseal region between the mental foramens, detaching all the mucosa (Figure 3). The lesion was easily removed, despite the intraosseous nature of the lesion and the adherence to the mandibular symphysis (Figure 4 and 5). The cortical bone was regularized by osteoplasty (Figure 6) but it was necessary to remove the deciduous teeth involved (Figure 7). The region was covered with the mucogingival flap and sutured with absorbable suture thread (Vicryl 3.0) (Figure 8). The patient received analgesic, anti-inflammatory and antibiotic drugs.

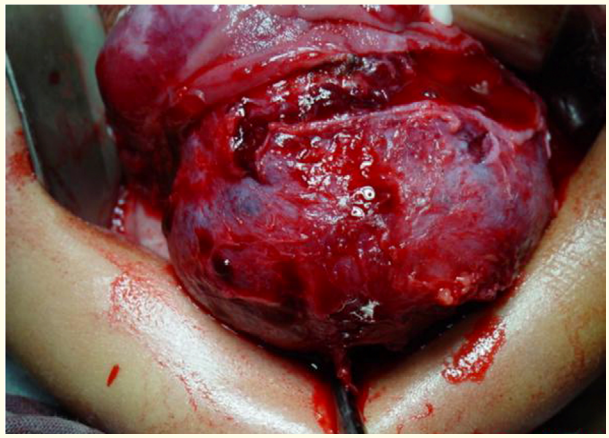

Figure 3: Incision at the mandibular base of the lesion (fornix) in the symphyseal region between the mental foramens, detaching all the mucosa.

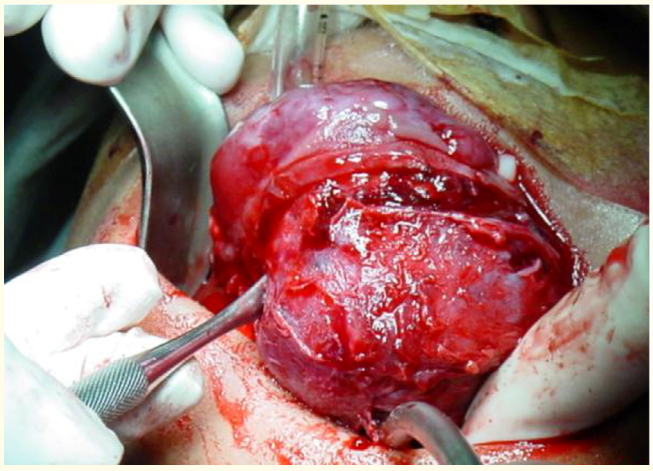

Figure 4: Detachment of the lesion.

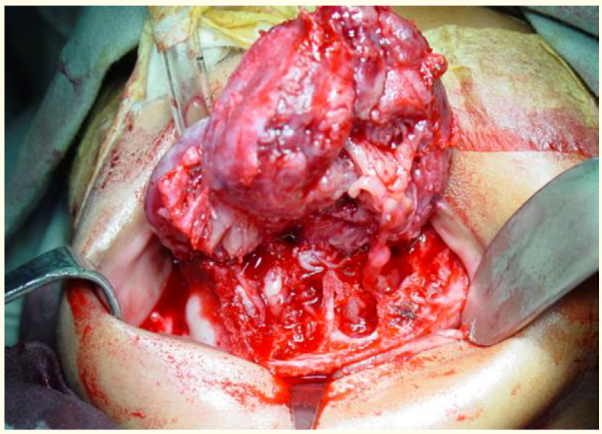

Figure 5: Removal of the lesion.

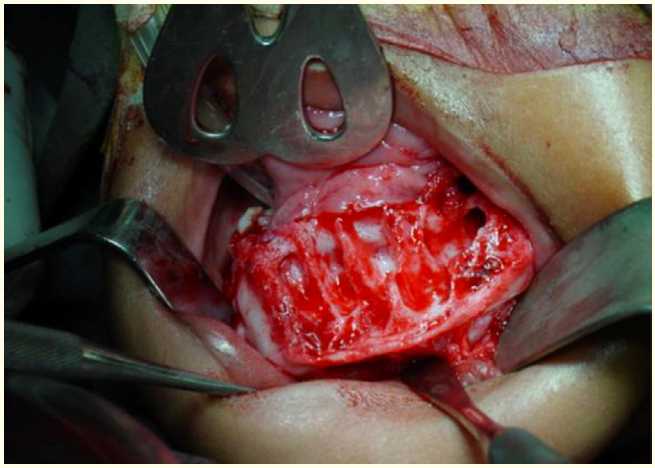

Figure 6: Cortical bone regularized by osteoplasty.

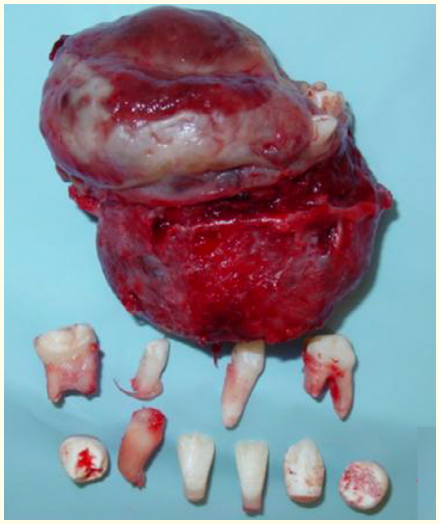

Figure 7: Lesion and teeth removed.

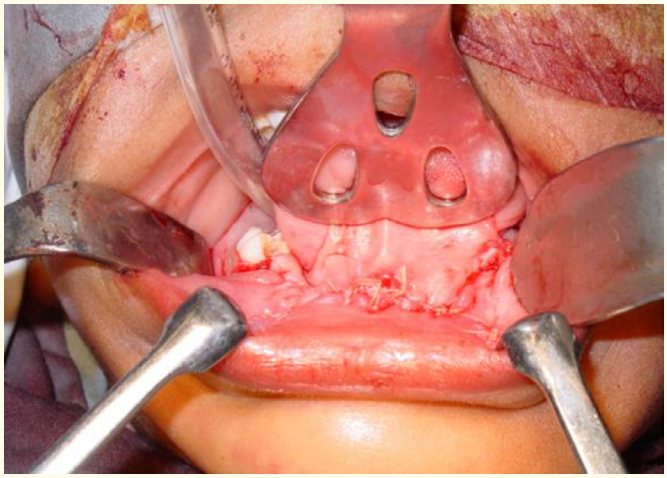

Figure 8: Mucogingival flap sutured with absorbable suture thread.

Histological sections revealed proliferation of cellularized and dense mesenchymal tissue with spindle-shaped cells. Multinucleated giant cells were observed scattered throughout the stroma, with rounded and elongated shapes. Immature bone tissue, blood vessels, and hemorrhagic areas were also observed. The final diagnosis was central giant cell granuloma (Figure 9).

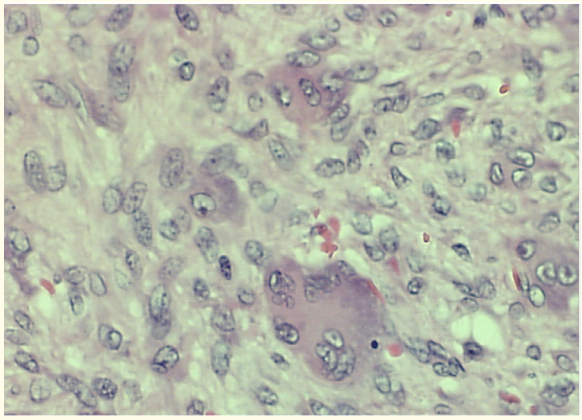

Figure 9: Histopathological aspect of central giant cell granuloma (staining: HE; 40X magnification), presenting multinucleated giant cells in the midst of densely cellularized mesenchymal tissue.

After 15 days, the patient came for a post-surgical visit. Minor discomfort was reported, but the surgical site showed satisfactory healing. The patient has been under annual evaluation for 2 years with no signs of recurrence.

Discussion

The central giant cell lesion is characterized by an osteolytic intra-osseous lesion, with an increase in the soft tissue mass, and can be symptomatic or asymptomatic, uni- or multilocular, attaining a variable size (from 15 to 20 mm). It can cause an increase in volume, with facial asymmetry, expansion and perforation of the cortical bone, displacement or impaction of teeth, and root resorption of the teeth adjacent to the lesion [1,7-10,13-20]. Generally, the lesion is associated with vital teeth [15,17]. However, the lesion could be related to tooth loss and compromise the tooth germs in children [15], as can be seen in the present case. In the maxilla, the lesion may invade the maxillary sinus, orbit and nasal fossa. It can be classified as aggressive (with symptomatology and rapid growth; root resorption; and tendency towards recurrence) or non-aggressive (asymptomatic; without root resorption; and little tendency towards recurrence) [16,17]. Multiple lesions in the same bone are rare, and when they are present, they are frequently associated with hyperparathyroidism.

Regarding radiographic images, central giant cell granuloma are usually radiolucent [1-6]. In the present case, computed tomography showed a hypodense image surrounded by a hyperdense image, characterizing the buccal mandibular cortical and intraosseous lesion.

Inherent to the incidence and frequency, the central giant cell granuloma is more common in the mandible than in the maxilla, particularly the anterior region and adjacent to the midline [1,9,13,14,18,22] It affects persons in the three first decades of life with greater frequency, and greater predilection for the female gender, in a ratio of 2:1, in comparison with the male gender [1,7-9,13,14-17,21]. In a retrospective study, Jones and Franklin (2006) [11] reviewed 53.666 biopsy specimens, among which 4,406 (8.2%) came from children between 0 to 16 years of age. Of these, 22 (0.5%) were diagnosed as central giant cell granulomas.

Clinically, the lesion could suggest peripheral ossifying fibroma, peripheral giant cell lesion or a lateral periodontal cyst. As it was a radiographically atypical lesion, considering the diffuse characteristic of the central giant cell lesion, one would expect it to be a lateral periodontal cyst, with loss of the lamina dura in the mesial region of tooth [7]. One could also expect a fibrous dysplasia, aneurismatic bone cyst, brown tumor associated with hyperparathyroidism, keratocystic odontogenic tumor, adenomatoid odontogenic tumor [1,5,12,13,23] and ameloblastoma [13,14,22,23]. Among the malignant lesions, although less frequent, osteogenic sarcoma, fibrosarcoma, malignant fibrous histiocytoma, malignant giant cell tumor [14,22] and lymphoma have been described [22].

Central giant cell granuloma still presents an unknown etiology, although it is postulated as a reactional process resulting from local repair, and may occur after trauma with intramedullary hemorrhage [1,6,8,13,14,21,23]. Because of the higher incidence in females, hormonal influence has been hypothesized [22].

The histological aspect is variable, as it is constituted of fibrous stroma (with fusiform cells and multinucleated giant cells that could be scattered or aggregated into hemorrhagic foci) or loose (greatly vascularized). Capillaries can be observed, with few endothelial cells; fibroblasts; myofibroblasts; osteoclasts; occasional mononucleated cells; extravasation of blood cells and hemosiderin and hematoidin deposits [1,3,5,8,10,17,22,23]. According to Dahlkemper., *et al*. (2000) [17], there is no difference in the histologic components between the aggressive and non-aggressive forms. However, there is an increase in the number of giant cells in the aggressive form, although without an increase in DNA. Its histopathological constitution is the same as that of hyperparathyroidism and cherubism [7,12].

The recommended treatment is surgical exeresis by curettage, enucleation or, in more advanced cases, bone resection is indicated [1-3,5,7,8,13,14,16-24]. In the present case, despite the size of the lesion, surgical excision was effective in treating the lesion. Alternative treatment modalities have been proposed, such as intra-lesional corticosteroid injection, triamcinolone, human calcitonin, denosumab and systemic interferon, with varied result [1-3,5,8,13,14,16,18-21,24].

As it concerns a pathology with destructive potential, follow-up must be strictly carried out. The rate of recurrence was described as being from 0 to 49% [3,7,8,10,21,22], normally related to failures of curettage in aggressive lesions [14].

Considering the frequency in the child population, the osteolytic and locally aggressive nature, even if benign, the need for extensive surgical procedures, and the risk of morbidity and aesthetic consequences to the patient, careful evaluation of craniofacial growth should be considered in the surgical treatment of central giant cell granuloma, avoiding aesthetic and functional facial deformities, such as chewing, swallowing, speaking, and breathing [1,2,4,5]. In the present case, despite the size of the lesion in the 4-year-old patient, there were no sequelae or restrictions to usual functions.

Conclusion

The central giant cell granuloma may present aggressive behavior, despite being a benign osteolytic lesion. In view of its frequent involvement in the young population and particularly in children, surgical excision should be considered as soon as possible, favoring the prognosis of these patients, as observed in this report. In view of the high recurrence rate, long-term clinical and radiographic follow-up is imperative.

Bibliography

1. Khavanin N, White MJ, Walsh JM, Steinberg JP. Mandibular reconstruction following central giant cell granuloma resection in primary dentition: a case for the use of a costochondral graft. Cleft Palate Craniofac J. 2021;58(2):260-268.

2. Mendonça RP, Mitre GP, Real FH, Kataoka MSS, Alves Jr SM, Vianna P, Silva Jr NG, Pinheiro JJV. Central giant cell granuloma treated with intralesional corticosteroid injections and bisphosphonates: a long-term follow-up case study. Head Neck Pathol. 2020;14(2):497-502.

3. Choe M, Smith V, Okcu MF, Wulff J, Gruner S, Huisman TAGM, Venkatramani R. Treatment of central giant cell granuloma in children with denosumab. Pediatr Blood Cancer. 2021;68(3):e28778.

4. Moura LB, Tarquinio SBC, Gomes APN, Schinestsck AR, Torriani MA. Modified approach to central giant cell lesion. J Clin Pediatr Dent. 2018;42(4):292-294.

5. Spini R, Juchli M, Fernández M, Ramírez Z. Giant cell granuloma in the jaw in a 6-year-old child: a case report. Arch Argent Pediatr. 2019;117(2):e173-e177.

6. Wang Y, Le A, Demellawy DE, Shago M, Odell M, Johnson-Obaseki S. An agressive central giant cell granuloma in a pediatric patient: case report and review of literature. J Otolaryngol Head Neck Surg. 2019;48(1):32.

7. Waldron CA. Bone pathology. In: Neville BD, Damm DD, Allen CM, Bouquot JE (eds). Oral and Maxillofacial Pathology (ed 1). Philadelphia, WB Saunders, 1995:443-492.

8. Newland JR. Oral and maxillofacial pathology case of the month. Central giant cell granuloma. Tex Dent J. 2000;117(9):64-83.

9. 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 Endod. 1996;81(6):720-726.

10. Kermer C, Millesi W, Watzke IM. Local injection of corticosteroids for central giant cell granuloma. A case report. Int J Oral Maxillofac Surg. 1994;23(6 Pt 1):366-368.

11. Jones AV, Franklin CD. An analysis of oral and maxillofacial pathology found in children over a 30-year period. Int J Paediatr Dent. 2006;16(1):19-30.

12. Neville BD, Damm DD, Allen CM, Bouquot JE. Oral manifestations of systemic diseases. In: Oral and Maxillofacial Pathology (ed 1). Philadelphia, WB Saunders, 1995:594-626.

13. Sidhu MS, Parkash H, Sidhu SS. Central giant cell granuloma of jaws - review of 19 cases. Br J Oral Maxillofac Surg. 1995;33(1):43-46.

14. Allen DT, Sheats RD. A central giant cell granuloma in a patient seeking orthodontic treatment. J Am Dent Assoc. 2001;132(9):1255-1260.

15. Ardekian L, Manor R, Peled M, Laufer D. Bilateral central giant cell granulomas in a patient with neurofibromatosis: report of a case and review of the literature. J Oral Maxillofac Surg. 1999;57(7):869-872.

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(2):161-166.

17. Dahlkemper P, Wolcott JF, Pringle GA, Hicks ML. Periapical central giant cell granuloma: a potential endodontic misdiagnosis. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2000;90(6):739-745.

18. Kurtz M, Mesa M, Alberto P. Treatment of a central giant cell lesion of the mandible with intralesional glucocorticosteroids. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2001;91(6):636-637.

19. Rajeevan NS, Soumithran CS. Intralesional corticosteroid injection for central giant cell granuloma. A case report. Int J Oral Maxillofac Surg. 1998;27(4):303-304.

20. Thomas N, Seshadri MS, Thomas G, Chacko R, Samraj T, Nair S, Ponnaiya J, Cherian T. Association of central giant-cell granuloma of the maxilla with pyknodysostosis. Br J Oral Maxillofac Surg. 2000;38(2):159-160.

21. De Lange J, Rosenberg AJWP, Van Der Akker HP, Koole R, Wirds JJ, van den Berg H. Treatment of central giant cell granuloma of the jaw with calcitonin. Int J Oral Maxillofac Surg. 1999;28(5):372-376.

22. Roberson JB, Crocker DJ, Schiller T. The diagnosis and treatment of central giant cell granuloma. J Am Dent Assoc. 1997;128(1):81-84.

23. Martin JP, Unkel JH, Fordjour I. Preservation of the dentition following removal of a central giant cell granuloma: a case preservation. J Clin Pediatr Dent. 1999;24(1):35-37.

24. 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):848-853.

Volume 4 Issue 7 July 2021