

## The central giant cell granuloma in childhood: clinical case report

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*This report reviews the literature involving the central giant cell granuloma. Diagnosis and treatment are presented. The article reports the case of central giant cell granuloma, affecting the anterior region maxillary of a child, whom a conservative treatment, with cryotherapy, helped the preservation of anterior permanent teeth germs.*

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### INTRODUCTION

The central giant cell granuloma is a rare sort of lesion that is found in the maxilla. It was described for the first time almost 200 years more than ago and, ever since, it has been extensively studied.<sup>27</sup> The true nature of this lesion is unknown; while some authors define it as a true neoplasm, others insist in inflammatory or reactive aspects.<sup>1,2</sup>

This lesion commonly occurs in children and young adult mandibles, with a slight preference for females. It is uncommon for central giant cell granuloma lesions its occurrence below the age of 10 years old.<sup>2,5,25</sup> The biological behavior can varies since the slow-growing, asymptomatic, up to a fast-growing, in association with pain, cortical bone and dental roots resorption and a high (35%) rate of recurrence.<sup>6,7</sup>

The radiographic lesion features is not pathognomonic and it can be misdiagnosed with a great deal of others maxillary lesions.<sup>8</sup> Recent lesions are small and unilocular, localized near the vital teeth, while the larger ones can present themselves multilocular, associated with cortical bone.<sup>9</sup> The diagnosis depends on the histopathology found and of the serum alterations absence in the level of calcium, phosphorus and alkali phosphates.<sup>7,11,12</sup>

Curettage has been indicated as treatment, although, in the aggressive cases, the block resection has secured favorable results.<sup>3,7,8,12,13,26</sup>

This work reports a clinical case of central giant cell granuloma, involving the pre-maxilla in children, whose conservative treatment, allied to the cryotherapy, granted the preservation of the anterior permanent teeth buds.

### REPORT OF A CASE

A white female child, 3 years and 5 months old, was addressed to an oral-maxillofacial surgeon to be assisted in a large growth in the pre-maxilla area. The intra-buccal clinical examination disclosed an asymptomatic tumefaction, between the teeth 53 and 63, with elastic consistence, measuring more or less 4cm of diameter, covered by a mucous membrane with normal aspect (Figure 1).

Panoramic, periapical and occlusal radiographs, were taken and through it was possible to observe a radiolucent unilocular area, with irregular contour and inaccurate borders, entailing the roots of temporary central incisors that showed a large resorption (Figure 2a). An incisional biopsy of the lesion was achieved, under general anesthesia, and the result was compatible to the central giant cell granuloma (Figure 2 b). Based on these results, serum dosage of calcium, phosphorus and alkali phosphates were performed and the

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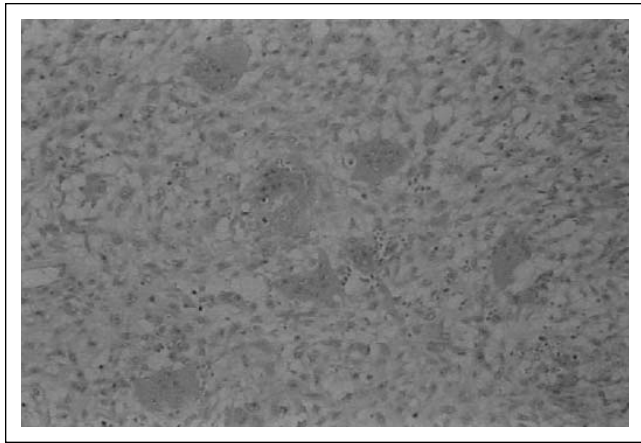
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**Figure 1.** Histological pattern of the lesion

levels were regular. A CT scan was taken to estimate the extension of the lesion and the relation to the adjacent structures, aiming the surgical planning (Figure 3).

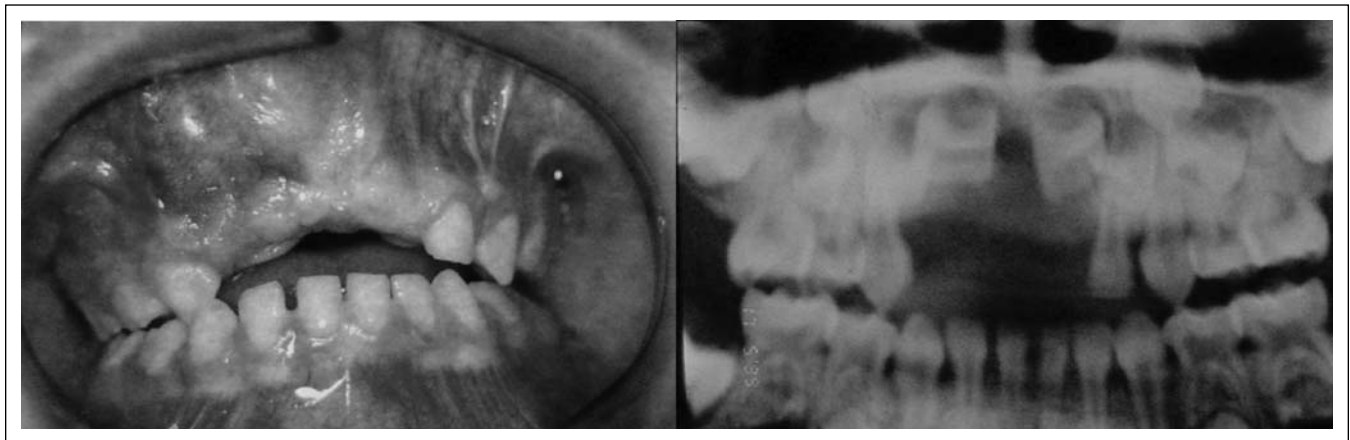
Under general anesthesia, the treatment, consisting of curettage, aimed the permanent central incisor buds preservation. After this first attempt, three successive recurrences were observed: 6 months, 18 months and 27 months later. At the first and second recurrence

episodes, curettages were done; at the third episode a new curettage was completed with cryotherapy. The liquid nitrogen was applied in the surgical bedstead, using the cryospray, in three cycles of 20 seconds each, and a break of 60 seconds between them, taking care of the teeth germs in the nearby.

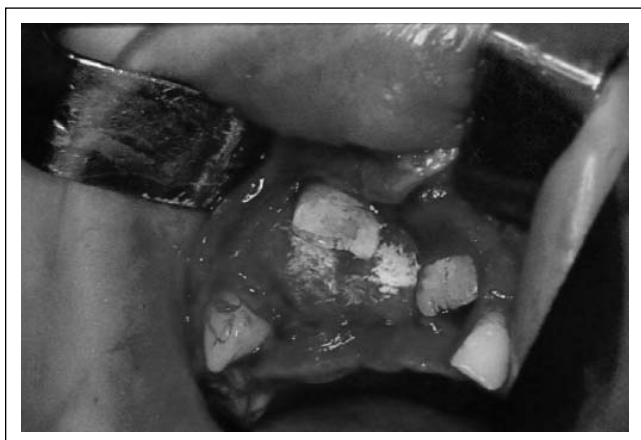
During the next 36 months later, episodes of recurrence were not noticed anymore. Nowadays this area presents anatomical and radiographic repair, and the teeth 11 and 21 present a complete developed eruption process (Figure 4).

### DISCUSSION

It is not uncommon for malignant or benign lesions of the jaw to contain multinucleated giant cells. Malignant lesions as: osteogenic sarcoma, fibrosarcoma, malignant tumor of giant cells, malignant fibrous histiocytoma and benign lesions as: fibrous dysplasia, ossifying fibroma, cementifying fibroma, aneurismal bone cyst, brown tumor of hyperparathyroidism and the giant cell tumor, must be considered for the differential diagnosis.<sup>7</sup> In order to obtain a conclusive diagnosis, of central giant cell granuloma it must be associated to and absence of biochemistry changes in the alkali phosphates, calcium



**Figure 2.** Clinical and radiographic features of recurrence of the lesion



**Figure 3.** Curettage of the lesion and cryotherapy application



**Figure 4.** Clinical features 36 months later the last treatment

and phosphorus serum.<sup>14</sup> In consequence, patients suspect of having parathyroidism also should have the parathyroid levels evaluated.<sup>14,15</sup>

The central giant cell granuloma is, usually, asymptomatic, and it is discovered in a routine radiographic exam. This lesion can be escorted by pain, resorption or roots displacement and recurrence after surgical removal.<sup>7,24</sup> Usually, the aggressive lesions affect young children, with a consequent delay to make a diagnosis and appeal frequently.<sup>7</sup> The osseous density associated to a low grade of calcification, could be a reason to make easier the progress and the aggressiveness of this lesion in children. In pediatric patients, especially in the age of mixed dentition, the superimposition of anatomical structures, frequently occurs complicating the radiographic analysis, and it can delay diagnosis and aggravate the case.<sup>4</sup>

The curettage or enucleation can be chosen as treatment for the central giant cell granuloma.<sup>3,8</sup> This therapy, however, is associated with recurrence, which in case of extensive lesions, results in a serious mutilation of the jaw and face.<sup>16</sup> In many cases, when the lesion involves a unerupted tooth, the classical treatment includes complete removal, as well as the lesion. Martin *et al.*,<sup>14</sup> showed a case of curettage with preserved succedaneous teeth, making possible successful development.

In this case, the association of curettage and cryotherapy was performed in the attempt to preserve the unerupted dental germs.

The cryotherapy has been a complementary manner of treatment to ameloblastomas and others invasive osseous lesions. Since the first experiences and clinical studies, this therapy has shown excellent effects in the maxillofacial area.<sup>17</sup> Webb and Brockbank<sup>18</sup> described a case of central giant cell granuloma and a keratocyst treated for curettage and cryotherapy. In 1978, Bradley<sup>19</sup> reported 25 osseous lesions (odontogenic and non odontogenic) treated by curettage followed by cryotherapy. Jensen *et al.*,<sup>20</sup> published 25 cases of odontogenic keratocyst treated by enucleation and enucleation followed by cryotherapy. They concluded that there was no difference in the recurrence grade in these cases.

The use of low temperatures permits the treatment "in situ" by bone devitalization and maintenance of the inorganic matrix.<sup>22</sup> The mechanism of tissues necrosis after cryotherapy is a combined formation of crystals of ice both extra and intracellular, resulting in a cellular insult as well as osmotic and electrolytic disturbance in cellular membrane.<sup>21</sup> The spray of liquid nitrogen has a great freezing power that reaches the temperature of 198° in a short time. It can be used to treat large and irregular maxillary cavities, but can be carefully use to preserve the next tissues.<sup>22</sup> Complications after the surgery with the osseous cryotherapy can occur and can

vary since edema and dehiscence to pathological fracture and bone sequestrum.<sup>23</sup> In this case, there were no signs of complications associated to the cryotherapy.

## CONCLUSION

It was possible to conclude in this case that the cryotherapy used as a complement to the curettage represents an option in the treatment of central giant cell granuloma. When it is indicated, it shows secure, effective and able to reduce recurrence rate, which is common with conservative surgical methods. Additionally, it prevents the use of aggressive surgical techniques that proceed in the loss of teeth, functional and esthetics deformities.

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