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Surgical treatment of cementoblastoma in maxillary associated on dentofacial deformity



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ABSTRACT

Cementoblastoma is considered an odontogenic tumor of neoplastic cementoblasts. The lesion was first recognized by Noeberg in 1930 and is considered as the only true neoplasm of cementum origin. Radiographically, a well-delimited radiopaque mass is observed, mainly involving one or more tooth roots of mandible. The treatment is well established in the international literature, and enucleation of the lesion is recommended in association with the extraction of the involved element with the attached calcified mass. We present a case of benign tumor (cementoblastoma) associated with the root apex of the third molar upper right quadrant, involving the maxillary sinus in a patient with class II dentofacial deformity. The treatment chosen was tumor enucleation in association with orthognathic surgery in the same procedure under general anesthesia. International literature is dedicated to discussing this case report.

1. Introduction

Cementoblastoma is a hamartomatous proliferation of cementoblasts, characterized by the disorganized deposition of cementum around the root portion of dental units, with a higher predilection in mandibular molars and premolars [1]. Historically, it was first described in 1927 [2] and is considered the only true neoplasm of cementum origin, comprising <1–6.2% of all odontogenic tumors [3]. According to the World Health Organization, it is classified as an odontogenic tumor, in the category of mesenchymal tumors and/or odontogenic ectomesenchyma with or without odontogenic epithelium [4]. Radiographically, the majority of these tumors are radiopaque lesions, but a thin radiolucent rim around the roots can be found in rare cases [5]. Histologically, it presents as a well-circumscribed tumor composed of cementum, surrounded by a fibrous capsule. Surgical enucleation is the treatment of choice, with rare recurrence (21.7–37.1%) [1]. In this report, we present a case of cementoblastoma associated with the root apex of the third molar upper right quadrant, involving the maxillary sinus in a patient with class II dentofacial deformity submitted to orthognathic surgery.

2. Case report

A 22-year-old, female, normosystemic patient was referred to our department – Piracicaba Dental School (FOP-UNICAMP) – for

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orthognathic surgery and correction of dentofacial deformity. In its initial orthodontic documentation, a radiopaque, circumscribed image with well-defined limits was observed, associated with the third molar upper right quadrant impacted in the maxillary arch involving the maxillary sinus (Fig. 1). Cone-beam computed tomography (CBCT) was requested for a better understanding of the characteristics of the lesion. This study showed an image of a large, amorphous, hyperdensal mass in the upper right maxillary sinus in axial, sagittal and coronal sections (Fig. 2). The mass showed intimate contact with the root dental apex, without any involvement of adjacent bone tissues. On physical examination, the patient was healthy, without increase in volume or bulging in the region. The mucosa covering the area of the lesion had the same color and texture as the surrounding mucosa, adjacent teeth without displacement and maintained pulp vitality. The sensory examination of the maxillary ramus of the trigeminal nerve was normal bilaterally. Furthermore, she had aesthetic concerns about her mandibular deficiency and midline deviation on the maxilla (3mm). She was diagnosed with Class II malocclusion and evidence of bone pathology in maxilla.

Due to its benign characteristics, the removal of lesion was planned in the same procedure with the Lefort I osteotomy, similar the other study [6,7], designed for the correction of dentofacial deformity. The patient remained in periodic clinical and radiographic follow-up while finalizing the pre-surgical orthodontic preparation. Pre-orthognathic surgical models, radiographs, computed tomography face and photographic examination revealed alteration on maxillofacial bones (Fig. 3A and B). The treatment planned was Le Fort I maxillary osteotomy to correct maxillary midline deviation 3 mm to the left in relation to the face and the removal of the tumor and bilateral sagittal split osteotomy for mandibular advancement of 5 mm with correction of anteroposterior discrepancy and Class II facial profile. Surgery was performed under general anesthesia and nasal endotracheal intubation. After downfracture (Fig. 4), removal of the tooth, and the lesion was removed effortlessly; the lesion had firm consistency, hardened and covered by a light fibrous capsule. Subsequently a curettage and peripheral ostectomy were performed with the aid of a drill in the region where the lesion was located. The maxillary and mandibular segment was stabilized and fixed with plate and screws on the right and left side on the anterior and posterior maxillary and mandibular buttress (the 1.5mm and 2.0mm systems were used for the maxilla and mandible, respectively). The specimen was submitted to anatomopathological analysis that revealed the diagnosis compatible with cementoblastoma. The orthopantomography (Fig. 5) and follow-up CBCT were performed for investigation in the post-surgical treatment (Fig. 6). Currently the patient is in the 2nd year of follow-up, shows satisfaction with the occlusal and aesthetic outcome and is disease-free.

3. Discussion

Cementoblastomas are rare benign odontogenic tumors originating from neoplastic cementoblasts. The male-female ratio has been reported as 2.1:1 with the mean age of 20.7 years [5]. This pathology is also reported associated with deciduous teeth [5], permanent teeth not erupted [8], multiple teeth [9] and more rarely in the maxillary sinus [10,11]. Our case becomes interesting and rare, since its location affects the maxillary sinus of a 16-year-old patient, being this location of anatomical difficulty for the accomplishment of the enucleation and treatment.

Temporary mobilization of the maxilla was first described by Cheever (1867) for the removal of a nasopharyngeal tumor [24]. In 1927, Wassmund presented the Le Fort I osteotomy to correct an anterior open bite [12]. After 151 years, the literature shows this surgical procedure as a safe treatment for lesions in the maxillary sinus region [6,13], also used for access to the base of the skull in the contemporary management of the chordomas by improving the operative field to achieve adequate resection [14]. Kamalpathey K and Sahoo MGNK cited that the transfacial maxillary swing, lip-split mandibulotomy, and Le Fort I proved to be successful in providing excellent access to most of the inaccessible tumor of the craniomaxillofacial region and are also versatile and flexible allowing a greater degree of modifications whenever required, yielding good results [15]. Therefore, the main advantages of this approach are the wide exposure, the clear visibility of resection margins, and the lack of superficially visible scar [16,17] showing satisfactory results for the surgeon and for the patient. We use this type of approach because it facilitates and guarantees total removal, allowing a peripheral ostectomy accompanied by curettage, preserving adjacent structures and excellent visualization.

Cementoblastoma usually shows swelling with or without pain. Less common clinical features include cortical perforation, displacement of adjacent teeth, reabsorption of adjacent roots, paraesthesia, pulp envelopes, and pathological fracture [1]. However, they may be asymptomatic and discovered only with routine radiographs, emphasizing the precise diagnosis. In this case reported, this pathology was discovered when requesting orthodontic documentation for orthodontic preparation, a fact that should never be neglected even in routine situations of dental services.



Fig. 1. Orthopantomography in the pre-surgical phase for orthognathic surgery.

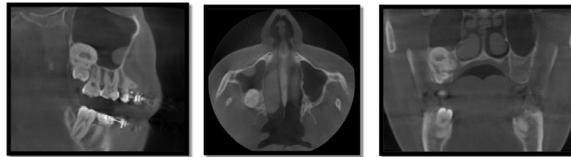


Fig. 2. Sagittal, axial and coronal sections of a conical beam CT scan showing hyperdense, amorphous lesion, involving upper third right quadrant in the right maxillary sinus. A suggestive image of mucous cyst in the anterior wall of the maxillary sinus is also noted.

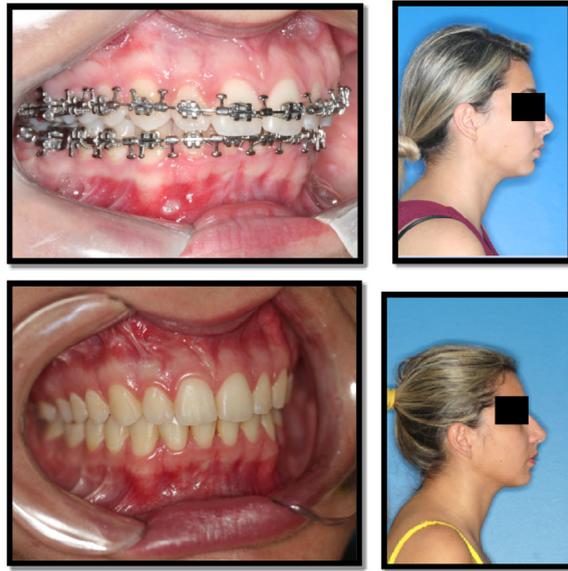


Fig. 3. Class II dentofacial deformity. A-B: preoperative step for orthognathic surgery. C-D: A 2-year follow-up after ortho-surgical treatment for correction of the Class II deformity.

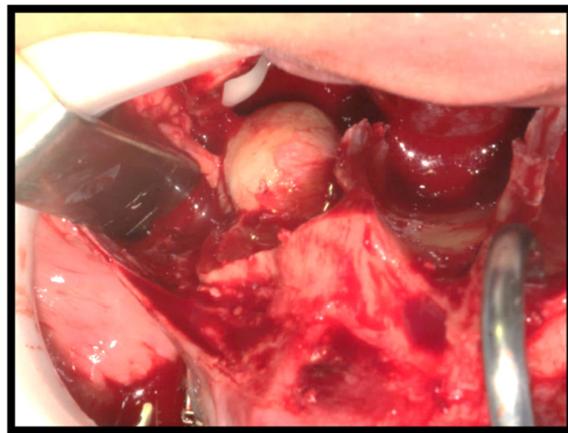


Fig. 4. Trans-surgical view after maxillary "downfracture." Note the involvement of large mass of cementoblastoma in the posterior region of the right maxillary sinus.

The typical radiographic presentation of cementoblastoma is a well-delimited radiopacity involving the root portion of dental units, especially in posterior regions of mandibular teeth, having a 4:1 jaw to maxilla ratio [3] and presenting hypercementose, osteoblastoma, periapical cemento-osseous dysplasia [18] and condensing osteitis [19] as differential diagnoses. The outline of the root or roots of the involved tooth is usually obscured as a result of root resorption and fusion of the tumor with the tooth. Due to these characteristics, CBCT becomes an important diagnostic tool in the sense of evaluating tumor characteristics, root resorption and the relation with the apical third of the dental unit in question.

Histologically this pathology is similar to osteoblastoma, being a unique reason why this is a physical substance of the root of the



Fig. 5. Orthopantomography in the post-surgical phase for orthognathic surgery.

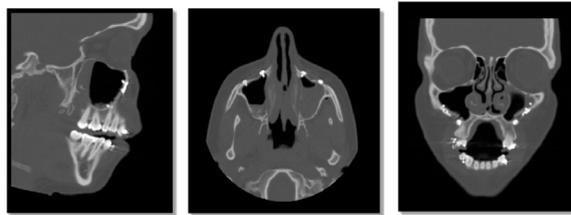


Fig. 6. Sagittal, axial and coronal sections of a CT scan of the post-operative period showing no signs of tumor in the right maxillary sinus and good repair without sinus invasion.

dental unit in question. Another interesting aspect is the cementoblastoma is continuous with a cement layer of the apical third of the dental root separated from the bone by the periodontal ligament, supporting this characteristic of odontogenic origin [20]. The present case presents radiographic, surgical and histological criteria of cementoblastoma, varying in their usual localization (premolar and molar in the mandible). Treatment is well established in the literature [1,21–23] and involves tooth extraction together with the attached calcified mass, followed by curettage and periapical osteotomy, which is performed in the presented clinical case. The prognosis is excellent and the tumor does not recur after total removal.

Cases that are not related to third molars such as our case may be treated with endodontic preservation of the dental unit, while surgical removal of benign cementoblastoma is instituted.

4. Conclusion

The Le Fort I osteotomy is a surgical technique that allows the treatment of lesions in the maxillary sinus region and, at the same time, the correction of facial deformities, providing an adequate visibility allowing to treat the pathology and return function and aesthetics to our patients with only one surgical procedure.

Conflicts of interest

The authors have stated explicitly that there are no conflicts of interest in connection with this article.

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