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Case Report

Bone Repair after Excision of a Large Dentigerous Cyst Associated with an Impacted Mandibular Canine: A Case Report with 4 Years of Follow-up

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Abstract

The dentigerous cyst is the most common type of developmental odontogenic cysts of the jaws. In most cases, the lesion is asymptomatic and is discovered incidentally on routine imaging examinations. Its etiopathogenesis is unknown. However, a unilocular radiolucent image associated with an impacted tooth is generally observed. Dentigerous cysts have a higher incidence in the region of the mandibular third molars, with a greater predilection for males, Caucasians and and diagnosed during the second and third decades of life. Generally, it is slow growing and painless. The differential diagnosis includes hyperplastic dental follicles, root cysts, unicystic ameloblastomas, odontogenic keratocysts and other odontogenic cysts and tumours. In most cases, it is a lesion with favorable prognosis, and the most common treatment is surgical enucleation. The purpose of this article is to present an unusual case of dentigerous cyst associated with impacted mandibular canine, which was removed and followed by filling with bovine mineral bone and collagen membrane, aided by osteosynthesis with reconstruction plate. The case has been followed for 4 years with no signs of recurrence.

***Keywords:** Dentigerous Cyst; Odontogenic Cysts; Oral Surgery; Oral Pathology; Bone Regeneration.*

Introduction

Odontogenic cysts are pathological entities that may originate from inflammatory mechanisms or from alterations in the epithelium of the dental formation tissues. These lesions may present themselves in several forms. However, a common feature is the involvement of a dental element associated with the pathology found[1].

Studies have shown that the occurrence of odontogenic cysts is varied. Demographic data pointed out that the incidence of these cystic lesions varied from 11% to 14% in relation to other cystic or tumoral pathologies in the jaws[2-4].

The dentigerous cyst is the most common type of developmental odontogenic cysts, being the second cyst with the highest incidence in the jaws[3]. Its pathogenesis is unknown. However, it seems to be associated with an accumulation of fluid between the crown of an impacted tooth and the reduced enamel epithelium[5].

The area of higher incidence of dentigerous cyst is the lower third molar region. However, the dentigerous cyst may be associated with any impacted tooth, with the lesion affecting the tooth, usually at the margin of the cemento-enamel junction. It is more prevalent in Caucasian males. The lesion can affect individuals of different ages, but there is a higher frequency in patients between 10 and 30 years[6].

Generally, the dentigerous cyst is an asymptomatic lesion. Therefore, in many cases, its initial diagnosis is made through routine radiographic examinations, where the absence of a tooth is investigated. Clinically, the lesion can be observed in several ways. In cases of small cysts, usually the absence of a tooth is observed, with no signs of cortical bone expansion, and the patient does not report pain. In more advanced cases, expansion and thinning of the cortical bone can be observed (causing facial deformity and crepitus on palpation), where edema and/or infection may be present, causing painful symptoms[7].

The purpose of this article is to present an unusual case of dentigerous cyst associated with impacted mandibular canine, which was removed and followed by filling with bovine mineral bone and collagen membrane, aided by osteosynthesis with reconstruction plate.

Case Report

A Caucasian male patient, 23-years-old, attended the dental clinic complaining of pain in the mentual region.

Clinically the patient presented fixed orthodontic appliance on the maxillary arch, gingival health and absences of the maxillary left lateral incisor and mandibular left canine. Fistulas were observed in the alveolar mucosa in the region of the mandibular anterior teeth. On palpation, soft and resilient oedema was observed in the midline and slightly to the right in the gingivolabial sulcus. The growth progressed slowly (Figure 1).

Extraoral evaluation revealed slight facial asymmetry due to elevation and bulging of the mentual region (Figure 2).

No history of trauma in the region was reported. No systemic alterations were reported.

Computed tomography demonstrated an expansile hypodense lesion associated with a retained left canine with bone destruction; a well-defined unilocular radiolucent lesion with sclerotic borders in the anterior region of the mandible. The lesion extended from the right second premolar to the region of the left second premolar (Figure 3). Marked bone destruction was apparent in the anterior basal part of the mandible with rupture of the buccal cortex (Figure 4).

Figure 1: *Initial clinical aspects: soft and resilient oedema in the midline and slightly to the right in the gingivolabial sulcus.*

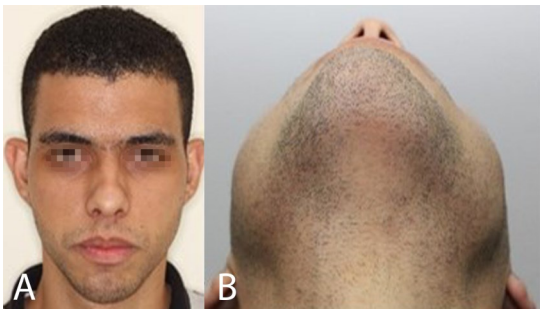

Figure 2: *Slight facial asymmetry due to elevation and bulging of the mentual region.*

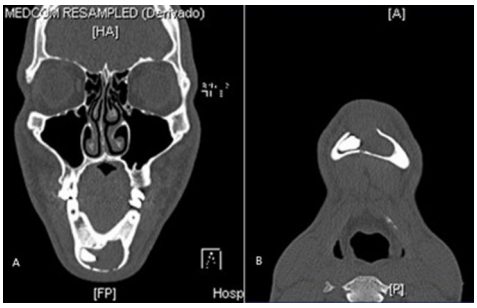

Figure 3: *Computed tomography showed an expansile hypodense lesion associated with a retained left canine with bone destruction.*

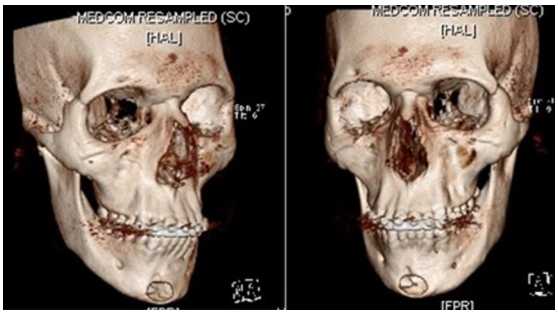

Figure 4: *3D reconstruction showed marked bone destruction in the anterior basal part of the mandible with rupture of the buccal córtex.*

Incisional biopsy was performed and the anatomopathological examination determined the diagnosis of dentigerous cyst. The microscopic analysis revealed a cyst wall lined by thin non-keratinized stratified squamous epithelium.

Surgery was recommended for excision and curettage of the lesion, associated with immediate reconstruction of the area affected by the lesion using synthesis materials and biomaterials to fill the residual bone cavity.

The surgical procedure was performed under general anesthesia and nasotracheal intubation. Additionally, in order to increase ischemia, local anesthetic was infiltrated in the anterior region of the mandible. An incision was made in the mucogingival line from the right canine to the left canine, followed by detachment of the mucoperiosteal flap. Despite buccal cortical bone resorption, osteotomy was performed to increase lesion exposure, allowing curettage and removal of the impacted tooth (Figure 5).

The bone cavity was abundantly washed with saline solution and filled with bovine mineral bone (BioOss™, Geistlich Pharma, Wolhusen, Switzerland). A reconstruction plate was employed for osteosynthesis with a 2.4 mm load (Anton-Hipp™, Annastrasse, Germany), reinforcing the mentual region (Figure 6). The region was covered with collagen membrane (BioGuide™, Geistlich Pharma, Wolhusen, Switzerland) (Figure 7). The flap was repositioned and sutured. Analgesic and antibiotic drugs were prescribed.

After 14 days, sutures were removed. No complaints or complications were reported. After 40 days, the patient was evaluated clinically and radiographically (Figures 8 and 9, respectively). The patient was followed up annually.

After 4 years, with the evolution of the orthodontic treatment, sufficient space was achieved for the installation of an osseointegrated implant in the left mandibular canine region (Figures 10 and 11). Computed tomography showed satisfactory bone density in the anterior region of the mandible (Figure 12). Four years after the surgical procedure, no signs of lesion recurrence were observed.

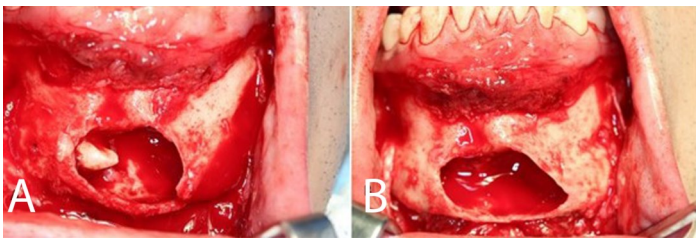

Figure 5: *Exposure of the bone cavity after cystic excision (A). Impacted tooth removed (B).*

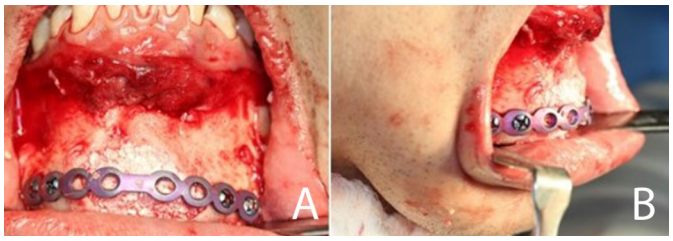

Figure 6: *Filling the bone cavity with bovine mineral bone and reinforcement of the mentual region with reconstruction plate for osteosynthesis.*

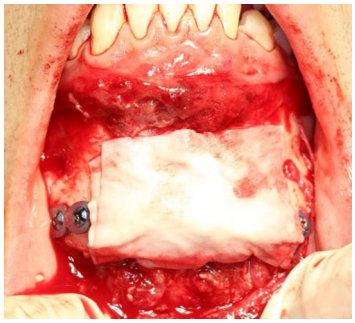

Figure 7: *Covering the surgical site with collagen membrane.*

Figure 8: *Post-surgical clinical aspects (40 days): satisfactory tissue repair.*

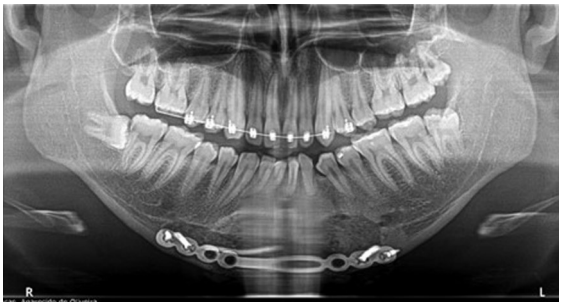

Figure 9: *Post-surgical radiographic aspects (40 days): absence of complications.*

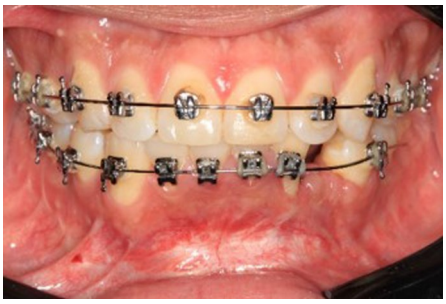

Figure 10: *Final clinical aspects (4 years): sufficient space for the installation of an osseointegrated implant in the left mandibular canine region.*

Figure 11: *Post-surgical radiographic aspects (4 years): satisfactory bone repair and installation of the osseointegrated implant in the left mandibular canine region.*

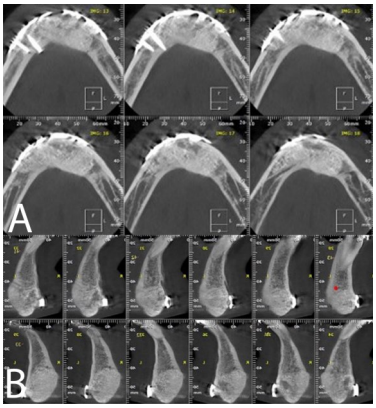

Figure 12: *Computed tomography showed satisfactory bone density in the anterior region of the mandible.*

Discussion

Dentigerous cysts are the most common cysts in the jaws, occurring more frequently from the first to the third decade of life, associated with impacted tooth crowns, such as lower third molars, followed by upper canines and lower premolars. It is noted that the lower third molars have a higher incidence of bone retention, which facilitates the appearance of dentigerous cyst[1,4].

The dentigerous cyst is formed as a result of fluid accumulation in the reduced enamel epithelium around an impacted tooth[5]. There are many effective treatments for these types of cysts with favourable prognosis and rare recurrences, but alternative clinical treatment should be based on age, size of the lesion, involvement of important anatomical structures and tooth associated with the lesion[7].

The technique of cystic decompression may help in removing the cystic fluid inside the lesion. On the other hand, cystic enucleation together with removal of the impacted tooth is the treatment of choice in most clinical cases. If tooth eruption is feasible, the approach is restricted to cystic enucleation alone[7]. In large lesions marsupialization is indicated[8].

The size of the cyst is an indicative factor for treatment planning. Small cysts can be easily enucleated and submitted to excisional biopsy and taken for histopathological analysis preserving the tooth involved. There are situations where more conservative treatment is required because there is cortical bone expansion and mucoperiosteal detachment is contraindicated for treatment with enucleation[1,4,7,8].

Histopathological analysis of the lesion is essential to rule out other hypotheses that make up the differential diagnosis, since the symptoms may be similar in other lesions. When clinical management and correct treatment are applied, dentigerous cysts disappear, but it is important to emphasize that clinical and radiographic follow-up is essential[1,7], as well as presented by us.

In the present case, we observed a great bone destruction in the mentual region, caused by the expansion of the lesion. Due to this situation, we performed osteosynthesis with a 2.4 mm reconstruction plate to allow the recontouring of the chin region, reducing the chances of postoperative facial deformity.

Conclusions

Dentigerous cysts are very common. The dental surgeon should be trained to analyze and diagnose these lesions. It is up to the dental surgeon to conduct and plan the clinical treatment based on factors such as the age of patient, location, size of the lesion, associated teeth, and the anatomical structures involved. We conclude that the prognosis is favorable and recurrences are rare. It is worth emphasizing that periodic follow-up is essential for the clinical evaluation of the patient.

Conflict of Interest

The authors declare no conflict of interest.

References

1. Santosh ABR. Odontogenic Cysts. Dent Clin North Am 2020;64(1):105-119.

2. Das S, Das AK. A review of pediatric oral biopsies from a surgical pathology service in a dental school. Pediatr Dent 1993;15(3):208-211.

3. Daley TD, Wysocki GP, Pringle GA. Relative incidence of odontogenic tumors and oral and jaw cysts in a Canadian population. Oral Surg Oral Med Oral Pathol 1994;77(3):276-280.

4. Jones AV, Craig GT, Franklin CD. Range and demographics of odontogenic cysts diagnosed in a UK population over a 30-year period. J Oral Pathol Med 2006;35(8):500-507.

5. Regezi AJ, Sciubba JJ, Jordan RCK. Oral pathology: clinical-pathologic correlations. St Louis: Saunders, 2008:242-244.

6. Vasiapphan H, Christopher PJ, Kengasubbiah S, Shenoy V, Kumar S, Paranthaman A. Bilateral dentigerous cyst in impacted mandibular third molars: a case report. Cureus 2018;10(12):e3691.

7. Austin RP, Nelson BL. Sine Qua Non: Dentigerous Cyst. Head Neck Pathol 2021;15(4):1261-1264.

8. Abu-Mostafa N, Abbasi A. Marsupialization of a large dentigerous cyst in the mandible with orthodontic extrusion of three impacted teeth. A case report. J Clin Exp Dent 2017;9(9):e1162-e1166.

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