

The Successful Use of Decompression in the Management of Dentigerous Cyst: Case Report

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Abstract

The dentigerous cyst is reported to be one of the most common odontogenic cyst, of developmental origin, which is characterized by its association with an impacted tooth. Often asymptomatic, the dentigerous cyst presents as a well-limited unilocular radiolucent image surrounding the crown of an unerupted or impacted tooth. Decompression is a conservative treatment option for dentigerous cysts, used especially in children, to preserve the cyst associated tooth, promote its eruption and to avoid lesions of the mandibular canal. This report presents a mandibular dentigerous cyst associated with the 35 impacted tooth in a 12-year-old girl. The dentigerous cyst was successfully treated by surgical decompression.

Keywords: Case report, decompression, marsupialization, dentigerous cyst.

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INTRODUCTION

The jawbone can be the location of a wide variety of cysts, including dentigerous cyst, which is the second most common odontogenic cyst after radicular cysts.

Dentigerous cysts are developmental cysts defined as a cystic cavity that are attached to the cervical region of an unerupted tooth and surround its crown [1].

Over the years, various surgical techniques have been proposed for the management of these cysts, ranging from conservative to radical. Marsupialization and decompression are two common conservative techniques to treat these types of lesions.

Aim

The aim of this paper is to present a clinical case of a dentigerous cyst in a young patient, successfully treated by decompression, to describe our diagnostic approach and the therapeutic procedures adopted.

PATIENT AND OBSERVATION

A 12-year-old female patient was referred by her general dentist to the Department of Medicine and Dental Surgery of the Military Hospital of Tunis, Tunisia, following the incidental discovery of a radiolucent image opposite the impacted tooth 35 during a routine panoramic radiography.

Patient's medical and family histories were non-contributory.

On clinical examination, the patient was in the mixed dentition stage, showing a deformed vestibular cortex in the area of the missing 35. Primary tooth 75 was still present on the arch and decayed. The 34 was distal and the 36 mesial (Figure 1).



Figure 1: Clinical examination: Mixed dentition stage +vestibular bulging opposite the site of 35 (Circle). The 34 was distal and the 36 was mesial

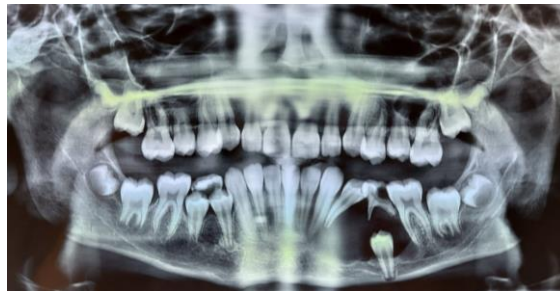


Figure 2: Panoramic radiograph: Well-limited radiolucent area surrounding the crown of the 35 tooth impacted and displaced at the basilar margin of the mandible

Diagnostic Assessment

The panoramic radiograph revealed a well-limited radiolucent area surrounding the crown of the 35 tooth (the root is not edified) impacted and displaced at the basilar margin of the mandible (Figure 2).

The cone-beam computed tomography confirmed the presence of the lesion, which involve the left body of the mandible and surround the crown of the impacted 35 tooth. There was an expansion and thinning of the buccal cortical of the mandible which appeared perforated in places. The mandibular canal was intact and impacted (Figure 3).



Figure 3: CBCT: well-limited radiolucency image surrounding the crown of the impacted 35(Arrow). Expansion and thinning of the buccal cortex of the mandible. The mandibular canal was intact and impacted

Diagnosis

In view of this radiological appearance, provisional diagnosis of a dentigerous cyst was considered and decompression was chosen instead of enucleation in order to preserve the 35 and promote its eruption. Keratocyst and unicystic ameloblastoma were considered as a differential diagnosis, hence the need to perform a histological examination.

Therapeutic Interventions

The surgical protocol consisted of extraction of the 75 tooth, removal of the "roof" of the cyst in order to perform the pathological examination and to rule out other more aggressive lesions, followed by decompression by placing a drain fixed by suture to the mucosa, aspiration of the cyst contents combined with abundant saline irrigation.

Finally, a space maintainer was placed in order not to aggravate the version of the adjacent teeth, i.e. 34 and 36 (Figure 4).

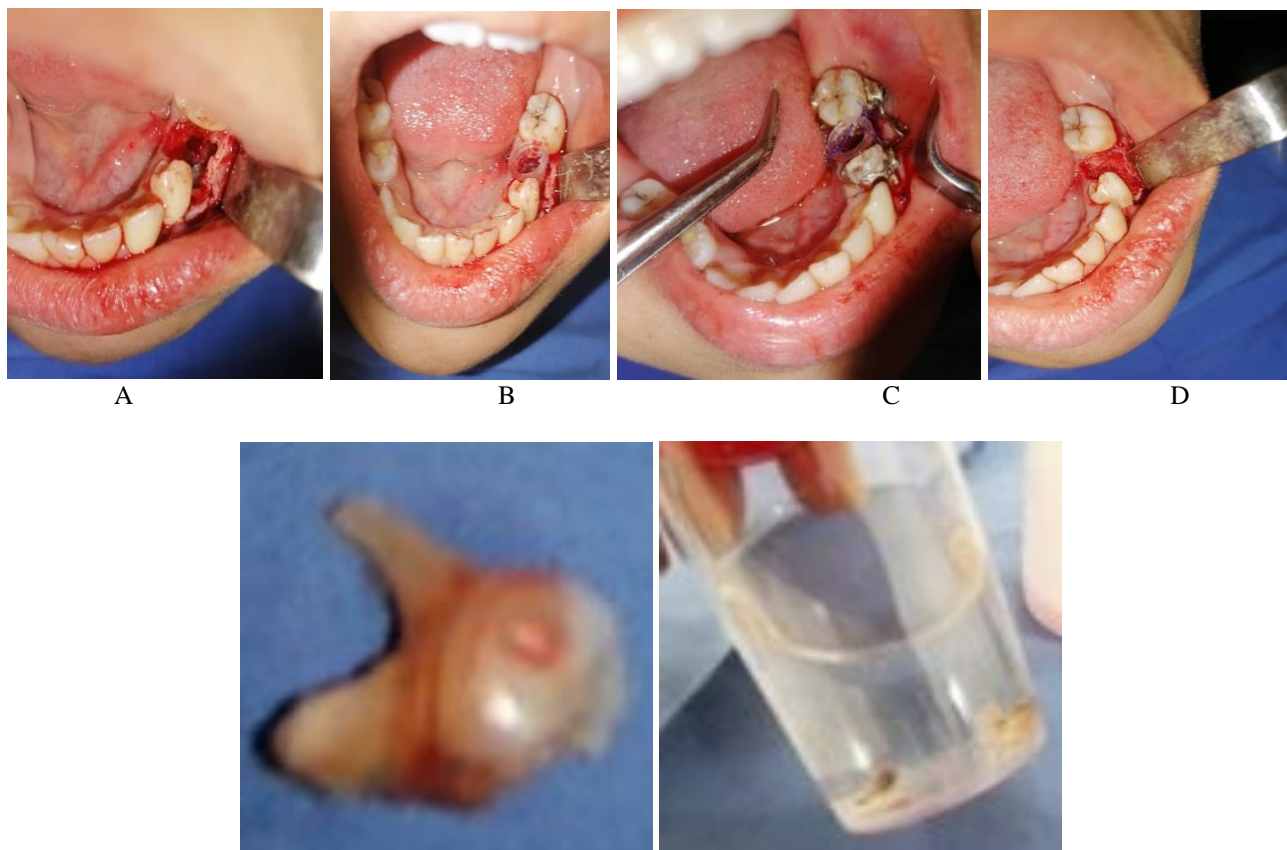


Figure 4: Operating protocol: A: extraction of Primary 75, B: The "roof" of the cyst was removed and a pathological examination was requested: Dentigerous cyst, C: Decompression by placing a drain that has been fixed in place by suturing it to the mucosa, D: installation of a space maintainer

A treatment based on an amoxicillin antibiotic, a level 1 analgesic and a mouthwash was prescribed postoperatively.

Recommendations for daily washing through the drain with a saline solution were given to our patient.

The anatomopathological examination result was in favour of a dentigerous cyst with no histological evidence of malignancy.

Follow-up and Outcome of Interventions

Regular follow-up for 9 months resulted in a favourable evolution with progressive reossification, complete healing of the dentigerous cyst and resumption of the eruption of the affected tooth (Figures 5, 6, 7, 8, 9).



Figure 5: Radiological control at 6 weeks: resumption of the eruptive movement of the 35

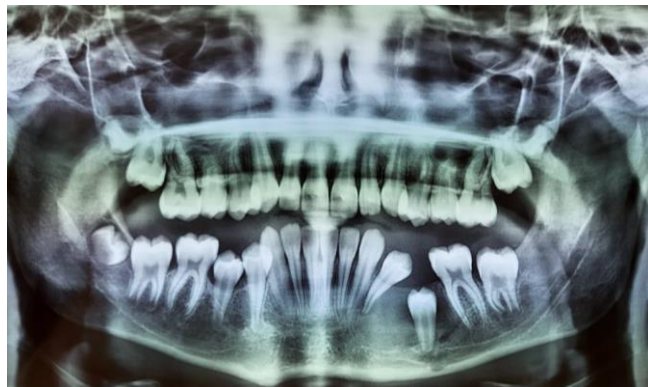


Figure 6: Radiological control at 4 months: beginning of reossification of the lesion

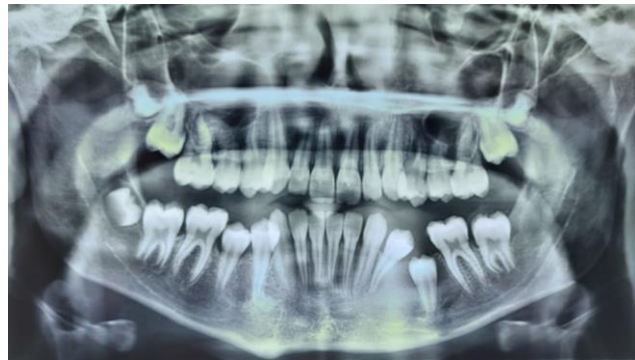


Figure 7: Radiological control at 6 months



Figure 8: Radiological control at 8 months: complete healing of the dentigerous cyst

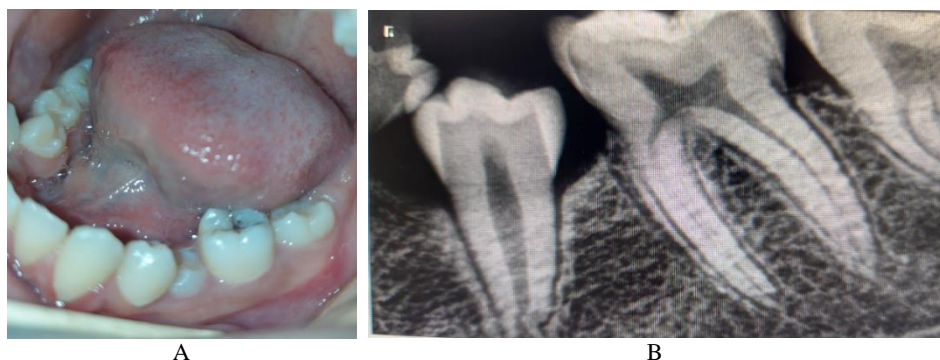


Figure 9: Control at 9 months A: clinical view of the 35, B: retroalveolar image

The patient was referred to an orthodontist for space planning for the 35 that was blocked under the crown of the distal 34, its orthodontic traction as well as further management of its dental crowding (Premolar area on the right side).

Unfortunately the patient was subsequently lost to follow-up and did not return for her follow-up appointment.

DISCUSSION

According to the latest WHO 2017 classification, the dentigerous cyst is a fairly common developmental odontogenic cyst (about 20% of all odontogenic cysts) that can be encountered at any age with a peak incidence between the 2nd and 4th decades of life [1].

The dentigerous cyst, with a slight male predominance, affects in decreasing order the mandibular 3rd molars (65% of all cases), maxillary canines, maxillary 3rd molars and mandibular second premolars. However, supernumerary teeth or odontomas may be involved [2].

The formation of a dentigerous cyst results from the accumulation of fluid either between the reduced enamel epithelium and the enamel of an erupting tooth or between the layers of the enamel organ [3].

Clinically, the dentigerous cyst is usually asymptomatic and is discovered incidentally on routine radiological examination. At a more advanced stage of evolution, the cyst may increase significantly in size causing bone destruction, cortical expansion, displacement or root resorption of adjacent teeth. Thus, a swelling can be a revealing sign. Delay in eruption can also reveal the presence of the cyst [4].

Radiologically, the dentigerous cyst appears as a unilocular, well-limited radiolucent lesion associated with an unerupted tooth. It can be of variable shape and can be voluminous [5].

The management of dental cysts presents a therapeutic challenge and the choice of the appropriate therapeutic modality is based on different factors.

Size, localization as well as the age of the patient, the teeth and the different anatomical structures involved represents the essential criteria for therapeutic choice [6].

Enucleation is the gold standard in the treatment of dentigerous cysts. It consists of a total removal of the cystic lesion associated with the extraction of the affected tooth.

Decompression and marsupialization of cysts are two conservative procedures that were first suggested by Partsch in the German literature in the late 19th century [7, 8].

Marsupialization involves removing a window from the lesion and suturing the surrounding mucoperiosteum to the margin of the cyst wall. If a drainage tube is inserted and attached to the site, this technique has been called decompression [6].

In our case, we are dealing with a young motivated patient, for whom a decompression was indicated.

The aim of decompression/marsupialization is to reduce the intracystic pressure, thus gradually reducing the size of the cavity associated with a bone apposition that progressively occurs at the location previously occupied by the epithelial covering of the cyst. It also avoids damaging the anatomical structures such as the inferior alveolar nerve and, mainly, preserves and promotes the eruption of the cyst-related tooth [3].

Yahara *et al.*, [9] concluded through their retrospective study of 21 dentigerous cyst-associated mandibular premolars that successful eruption of the latter without orthodontic traction can be predicted 3 months after marsupialization. The age of the patients (less than 10 years), the depth and the inclination of the

teeth are the factors that can affect the spontaneous eruption of these teeth. On the other hand, neither the formation of the dental root nor the eruption space affects these eruptions.

In our case, the favorable axis of the tooth and its apical immaturity were favorable factors for a future spontaneous eruption of the tooth after decompression.

Since spontaneous eruption of the tooth does not always occur after decompression, an orthodontic extrusion may be required in some cases [5, 9].

This combined orthodontic treatment allows traction of permanent impacted teeth associated with cystic lesions that did not erupt spontaneously after marsupialization even if they are deeply impacted, crowded or have a dilacerated root. It can also be indicated to correct the position of teeth after marsupialization. This saves a tooth in occlusion and prevents a young patient from psychological and mental trauma because of the loss of tooth [10].

In our patient, orthodontic treatment was indicated to correct his dental crowding and to guide the impacted tooth into its normal position. The latter was blocked by the adjacent crowded teeth, leaving insufficient mesio-distal space to complete its full eruption.

CONCLUSION

An orthodontic-surgical approach is a conservative and an effective therapeutic protocol that should be considered when planning treatment of a dentigerous cyst, especially in young patients with large lesions, in order to avoid damage to the surrounding structures, stimulate bone healing, allow conservation and promote the eruption of cyst-associated teeth.

COMPETING INTERESTS

The authors declare no competing interest.

Authors' Contributions

Patient management and follow-up: FH, HM. Writing of the article: FH. Revision of the article: FH, HM, HO, EB, RM, MBK.

All authors approved the final version of the manuscript.

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