

REPLANTATION OF MAXILLARY PREMOLAR INVOLVED IN DENTIGEROUS CYST: A CASE REPORT WITH EIGHT-YEAR FOLLOW-UP

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ABSTRACT

Dentigerous cysts are benign odontogenic cysts that are associated often with the crowns of permanent teeth. The aim of this paper is to help practitioners in the diagnosis, treatment and follow-up of a child with a dentigerous cyst, and to show the possibility of dental replantation after ablation of the cystic lesion. A ten-year-old boy was referred to our department of oral surgery with a diagnosis of dentigerous cyst involving maxillary right first premolar. Cyst enucleation was carried out with extraction of the involved tooth. Then, the premolar was immediately replanted into the cystic cavity. At the radiographic follow-up at 12 months, no recurrence was detected. After eight year follow up period the tooth was fully erupted and in perfect occlusion with positive response to the vitality test. Dental X-ray showed a lamina dura with root development. Cyst enucleation, extraction of involved tooth and immediate replantation might be considered as a viable treatment to obtain healing of the lesion, spontaneous eruption of the tooth and physiological restoration of bone.

KEYWORDS: Dentigerous cyst, odontogenic cysts, tooth replantation.**INTRODUCTION**

Dentigerous cysts (DCs) are the most common type of odontogenic cysts that encloses the crown of an impacted, embedded, or unerupted tooth by expansion of the follicle due to collection of cystic fluid between the tooth crown and the reduced enamel epithelium.^[1,2,3]

It mainly involving adolescents and younger adults, during the second and third decades of life, with little male predilection.^[1,2,4] The most frequently affected teeth are mandibular third molars, maxillary canines, and premolars.^[1,2,4]

DCs are usually asymptomatic, and they may be discovered incidentally after routine radiographic examination or when they are large enough to cause facial asymmetry.^[4,5]

Etiology of this lesion remains poorly understood. It is probably linked to a late degeneration or abnormal development of the follicle. Moreover, It can be induced by inflammation or infection of a temporary tooth or another source spreading to involve the tooth follicle.^[4,5,6]

Surgical enucleation of the DC combined with extraction of the involved tooth is the classic treatment but it is better to be conservative in managing this lesion in

children because dentition is yet to complete. Therefore, we need an alternative conservative and less invasive treatment.^[1,3,4,7,8] However, only some studies have described the technique of replantation of involved tooth immediately after cyst enucleation.

The aim of this work is to report a case of DC, in ten-year-old boy, treated by enucleation of the lesion and replantation of involved upper right first premolar into the cyst cavity.

CASE REPORT

A ten-year-old boy was referred to our department of oral surgery with chief complaint of facial asymmetry and a painless swelling of the upper right anterior region since few weeks. There was no previous history of any systemic pathologies or any trauma in the affected area. Extraoral examination showed swelling affecting paranasal region and upper lip on the right side with slight deletion of the right nasolabial fold (Figure 1a). Intraoral examination revealed hard and painless expansion of buccal cortical plates of the alveolar ridge extending from deciduous canine to second deciduous molar on the right side of the maxilla with a normal overlying mucosa (Figure 1b). Dentition was mixed with absence of upper right first premolar and presence of the corresponding deciduous tooth.

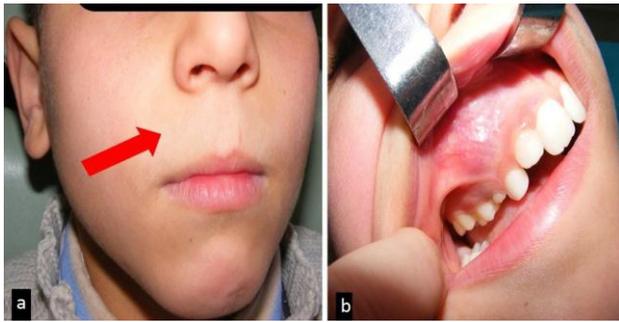


Figure 1: (a) Extraoral view showing facial asymmetry with paranasal and upper lip swelling; (b) intraoral view revealing right maxillary swelling of buccal alveolar bone.

Intraoral periapical (Figure 4a) and panoramic radiographs (Figure 2) revealed a well-defined unilocular radiolucent lesion involving the crown of the impacted maxillary right first premolar.



Figure 2: Initial panoramic radiograph showing a well-defined radiolucent lesion around the crown of the impacted upper right first premolar.

The clinical and radiologic features were consistent with a dentigerous cyst. Thus we decided to remove the lesion. The intervention was performed under local anaesthesia, with extraction of the first deciduous molar followed by enucleation of the cyst and, at the same time, extraction of the premolar involved due to its high mobility and the non-possibility of marsupialisation. Then, the involved tooth was replanted immediately into the cyst cavity after complete removal of the pathologic tissue from the crown and without any manipulation of the periodontal ligament and radicular cement. Finally, the surgical opening was sutured (Figure 3a-d). The surgical specimen was sent for anatomopathological examination. The patient was instructed to maintain good oral hygiene. No postoperative complications developed after surgery. One week later the surgical site showed good healing. The histological examination confirmed the diagnosis of DC.

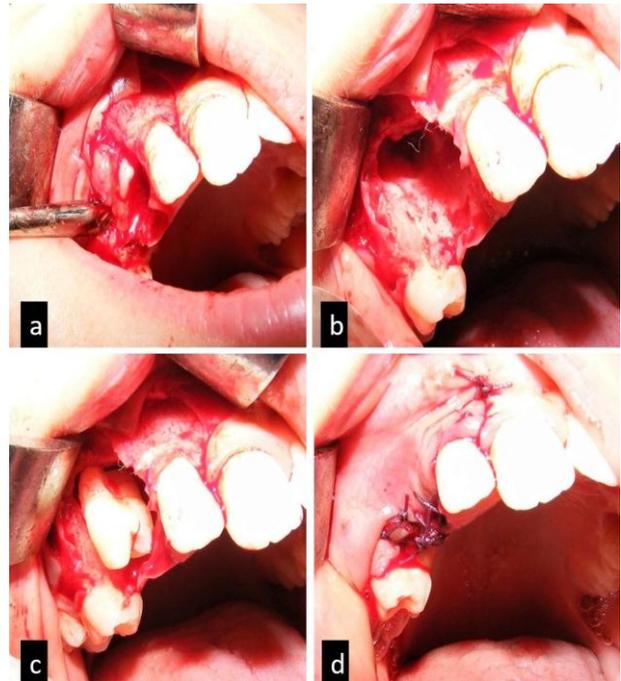


Figure 3: Perioperative surgical views: (a) cyst enucleation and extraction of involved tooth; (b) cyst cavity; (c) replantation of the premolar; (d) surgical sutures.

Three weeks later, a Nance holding arch was placed for space maintenance. Follow-up radiographs were repeated after 12 months, three years and after eight years (Figure.4a-d).

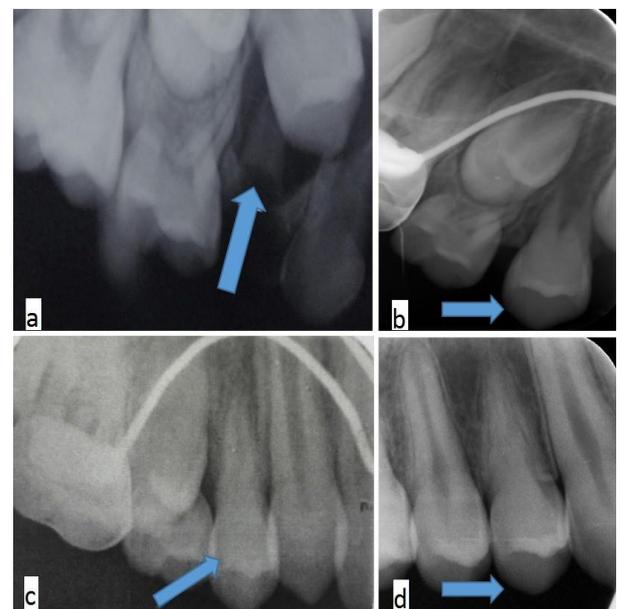


Figure 4: Periapical radiographs: (a) before surgery; (b) 12 months, (c) three years, (d) eight years after surgery.

After 12 months, the crown of the affected first premolar have erupted into proper position with positive response to the pulp sensibility test (Figure 5a and b). A periapical radiograph showed a beginning of root development

(Figure 4b). After three years, the patient was reviewed and we took a periapical radiograph which showed root edification without any recurrence of the lesion (Figure.4c).

After eight years of clinical and radiographic follow-up, the premolar was in perfect occlusion, responded positively to the vitality test (Figure 5c). Moreover, there were no root resorption and no ankylosis confirming the success of this therapeutic approach (Figure 4d).

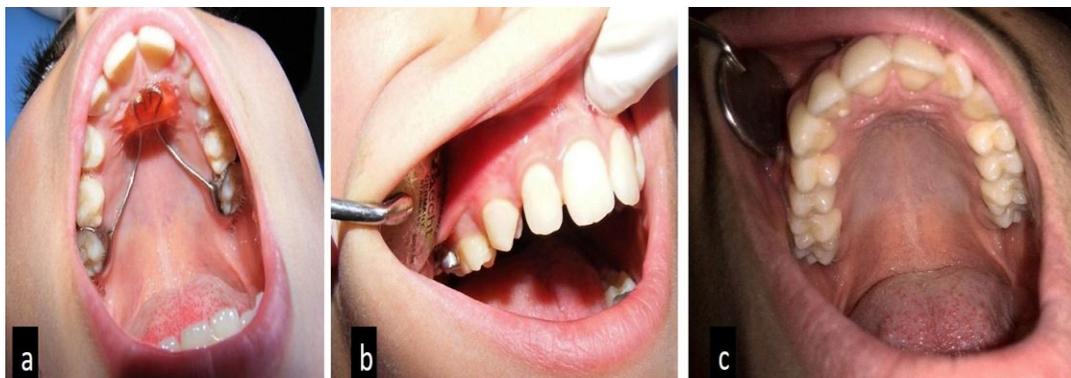


Figure 5: Intraoral photographs: (a and b) 12 months, (c) eight years after surgery.

DISCUSSION

DCs are the most common type of odontogenic cysts developed from epithelial residues of the enamel of the dental follicle at the junction enamel-cement in periphery of the crown of an unerupted tooth.^[5,6] This kind of cyst occurs most frequently in the mandibular third molar, maxillary canines, followed by mandibular second premolars, maxillary third molars, supernumerary teeth and, rarely, the central incisors.^[1,3] In our case, it was maxillary first premolar.

The etiopathogenesis remains unclear. It has been suggested that the pressure exerted by an erupting tooth on the follicle may obstruct venous flow inducing accumulation of exudate between the reduced enamel epithelium and the tooth crown which cause cystic degeneration of the reduced epithelium of enamel organ of the involved tooth. However, the DC developed in the child patient suggest an etiology induced by inflammation or infection of a temporary tooth, which defuses locally and implicates the follicle of a permanent tooth. The case described at this paper was probably associated with inflammatory processes caused by caries of the first deciduous molar.^[1,6]

Generally, DCs are painless and they are often discovered fortuitously, after a routine radiography. However, they may cause facial swelling if the DC grows too large or lies in a sensitive area. Sometimes there could be a painful phenomena, indicating an inflammatory process.^[3,5,6] They may progress slowly for many years without being noticed and can give rise to bone destruction, displacement of adjacent teeth and resorption of their roots, prevent eruption of the cyst-affected permanent teeth and therefore necessitate an early treatment.^[3] Koca *et al.* evaluated thirty-five children diagnosed with DC and determined that swelling was the main complaint in 70% of the children, while 5% experienced pain and 25% had no symptoms.

In the present case, the main complaint of the patient was facial and alveolar swelling.^[5,9]

Radiologically, the DC is described as a unilocular radiolucent lesion, well defined, developed around the crown of an unerupted tooth.^[6] They can be suspected when a follicular space measuring more than 5mm is observed.^[5,10] Conventional panoramic and periapical radiographs are sufficient to detect the lesion, but they may fail to define the full extent of the lesion. Therefore Computed tomography scans can be used especially in extensive lesions.

Since DC shares features with many other lesions, biopsy is an essential and fundamental diagnostic element for the treatment. A differential diagnosis have to be evoked with unicystic ameloblastoma, odontogenic keratocyst, adenomatoid odontogenic tumor and primary intraosseous carcinoma.^[1,6]

For the management of DCs, enucleation and marsupialization represent the main treatment modalities reported in the literature based on criteria such as patient age, size and location of the cyst, involvement of anatomical structures and the strategic significance of the impacted and involved tooth.^[4,7] Enucleation involves the complete removal of the cyst associated to the extraction of the involved unerupted tooth.^[5,6] However, marsupialization is a technique that attempts to open a surgical window for drainage of the cystic content and to expose the internal surface of the lesion in the oral cavity while preserving the permanent tooth involved in the cyst.^[3,6] It should be considered when tooth displacement and great loss of bone have occurred. Nevertheless, the major disadvantage of the marsupialization is the persistence of the pathological tissue left in situ. Even if a tissue sample is sent to the laboratory for histological examination, there is still the possibility of a more aggressive lesion in the residual tissue and the risks of persistence or recurrence of the lesion.^[3,5,6]

In 1956, Thoma have reported the first case of replantation of unerupted tooth involved in DC. The procedure bring about enucleation of all the pathologic tissue with the involved tooth, separation of the tooth from the cyst, and simple replantation in the residual cavity.^[4,8,11] In our case, considering the position of the tooth, which was very close to the bone crest, the good eruption potential and the greater capacity of bone regeneration in children, we decided to preserve the involved tooth by immediate replantation in the cyst cavity.

Experimental study showed that the pulp of the replanted tooth first undergoes necrosis, then the dead tissue is replaced by new one for 30 days after transplantation. Also, the same study revealed that the revascularization of the transplanted tooth occurs mainly by ingrowth of new vessels and that the process is complete after 30 days in the whole pulp.^[8,12] Moreover, pulp healing was showed in 96% of replanted teeth with incomplete root formation and only in 15% of those with complete root edification.^[8] In our case, the roots were not yet formed which promote the pulp healing. Furthermore, open tooth apex is an important consideration for a successful outcome. The apical foramen diameter of tooth above 1 mm is known to present a low risk for pulp necrosis.^[8,13] In our case, the apical foramen diameter was approximately 3 mm.

Thus, immediate replantation of tooth involved in dentigerous cyst allowed for spontaneous eruption of the impacted tooth by maintaining its vitality. It has the advantages of single surgical approach intervention, reduced hospital appointment, early tooth eruption and physiological restoration of bone. Moreover, compared with marsupialization, it eliminates the stress of oral toileting.^[7] However, this technique may lead to potential problems such as lose of vitality of the adjacent teeth, ankylosis of the replanted tooth with failure of eruption and need of a new surgical procedure for extraction of the tooth.^[4] In our reported case, the replanted tooth was fully erupted into the oral cavity in perfect occlusion with positive response to the vitality test. Moreover, the percussion of the premolar significantly showed no sharp sound, and a slight tooth mobility was observed. In addition, the radiographic findings showed a lamina dura and no root resorption, suggesting that the replanted tooth had no clinical evidence of tooth ankylosis.

The preservation of periodontal ligament cells represents an important prerequisite for a successful junction between root and bone.^[4] In fact, while removing the DC from the tooth, it is very important to avoid any manipulation of the periodontal ligament and radicular cement to prevent damaging of the Hertwig's epithelial root sheath (HERS) and subsequent ankylosis after replantation.^[4,8] Moreover, adequate space for the replanted tooth should be created by means of suitable devices such as a Nance holding arch as in our case.

Clinical and radiographic follow-up of the patient is very essential and should carefully be performed every six months to keep a check on potential recurrence, to control the eruption of the replanted tooth and its vitality.

CONCLUSION

Conservative treatment is a favorable treatment modality for DC in growing children and adolescents. This case illustrates the success of a surgical approach of a DC with immediate replantation of the tooth involved in the lesion. Thus, the complete eruption of the permanent tooth and its maintenance in the dental arch in perfect occlusion showed that this procedure may become a relevant technique for treating impacted teeth in DCs and to obtain healing of the bone lesion with spontaneous eruption of the involved tooth and physiological bone growth.

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