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Marsupialization as Conservative Management of Periradicular Cyst Associated with Primary Teeth

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Abstract

Background: Periradicular cysts are interestingly rare type of odontogenic cysts in children and may be diagnosed as Dentigerous cysts from the apically located permanent teeth. Case information: The following is a Periradicular cyst in an 8-year-old Sudanese boy with a swelling located below a pulp treated primary molar in the mandible. The cyst was treated conservatively by marsupialization to preserve permanent successors. Result: Two years postoperatively, excellent healing and permanent premolar teeth were self realigned and continue to develop and erupt into their normal positions. Conclusion: Marsupialization comes with fewer risks and excellent prognosis in preserving permanent teeth.

Keywords

Marsupialization, Decompression, Periradicular Cysts, Radicular Cyst, Primary Teeth

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1. Introduction

A cyst is “a pathologic cavity that contains fluid or a semi-solid material and is lined by epithelium” [1, 2]. Most of the cysts located in the jaw are lined by odontogenic epithelium and known as odontogenic cysts [1]. In adults, the most common odontogenic cysts are the radicular cysts, while they are quite rare in the primary dentition and represent less than 1% [3, 4] or as far as 0.5-3.3% [5-8].

Dental caries is the most common aetiological factor of radicular cysts, followed by trauma - especially when anterior teeth are involved [4, 7-10]. They originate from an inflammatory-mediated proliferation of epithelial rests of Malassez that are present in the apical periodontal ligament spaces [7, 8]. Radicular cysts enlarge gradually as a result of osmotic pressure within their cystic lumen [1, 6].

Marsupialization (Partsch’s operation/decompression) [6] is the fenestration of the cyst wall and lining, and connects its cavity to the oral cavity by suturing the inner surface of the cystic lumen with the oral mucosa, thus creating drainage with or without device (tube or stent). Moreover, it allows new bone formation to fill the defect in the absence of hydrostatic pressure [1, 6, 8, 11] and can be followed by obturator treatment [6]. This approach can assist in preservation of tooth buds, minimal impairment of skeletal growth, and can decrease chances of damaging adjacent anatomic structures such as the inferior dental canal [1].

In this Periradicular cyst, a marsupialization with thorough irrigation was made to avoid altering or damaging the underlying vital structures. Complete enucleation of the cyst including the permanent tooth bud was not recommended.

2. A Case Report

An 8-year-old Sudanese boy was presented to us with a non-painful left lower jaw swelling of 4 months duration. He has an unremarkable medical history but multiple caries. He underwent pulp therapy (pulpectomy) in the left second

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mandibular primary molar with formocresol and filled with zinc oxide eugenol two years before.

The physical examination revealed a bony swelling on the left side in the buccal side of the mandibular deciduous molar region which was localized. It was approximately 3×2cm with intact mucosa coverage, non-tender, hard with a fluctuant upper part in palpation. Panoramic and periapical view radiographs showed a well demarcated, non-sclerotic, unilocular radiolucency underneath the left side primary second molar with evidence of root resorption. Considerable displacement of the premolar tooth buds anteriorly and inferiorly was noticed. A radiopaque foreign body was found inside the cystic lumen located at the bottom of the lesion just posterior to the second premolar tooth bud which was considered to be related to the above treated pulpotomized second molar.

Figure 1. Pre-operative intraoral view, showing restored primary molars and swelling that expanded the buccal cortical plate.

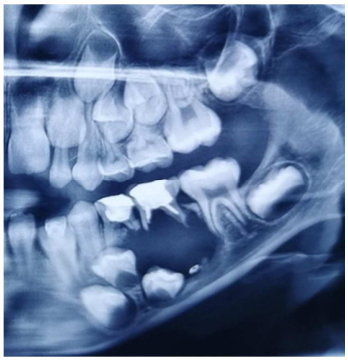

Figure 2. Preoperative radiograph that shows left side mandibular lesion with well demarcated radiolucency in relation to primary second molar and displacement of the permanent premolars. A small radio-opaque foreign body appeared in the bottom of the lesion.

Deferential diagnosis was made after aspiration of yellowish odourless fluid from the swelling, as it could be a Periradicular cyst from the lower left second primary molar or a Dentigerous cyst from the second premolar.

The cyst was treated under local anaesthesia with extraction of the associated deciduous molars and preservation of the permanent successors. Preoperative antiseptic mouthwash was used. Then, marsupialization of the cyst was done by making a 1cm round window at the fluctuant area of the cyst with a scalpel. The excised part was taken for biopsy which later showed an inflamed Periradicular cyst. The cystic cavity was evacuated from the contents and thorough irrigation was done. The cystic lining was sutured to the oral mucosa. A glove finger was sutured to the window for 10 days to prevent wound closure. No curettage or packing was placed. Postoperative mouthwash, analgesic and antibiotics were prescribed. The patient and his parents were instructed to thoroughly irrigate the cystic cavity frequently throughout the day and the patient had regular follow-ups. A lingual bar space maintainer was used to prevent space loss in the arch.

Figure 3. Two months postoperative radiograph of the patient showing early repositioning of the permanent premolar teeth

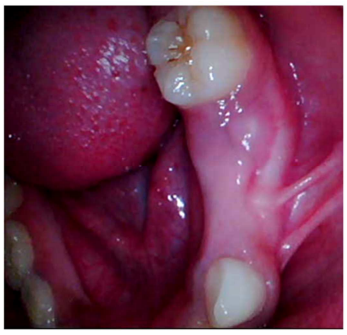

Figure 4. Five months postoperative view

A two years postoperative panoramic radiograph showed that mandibular left premolars returned back to their normal position with obvious root development and healthy well density bone around.

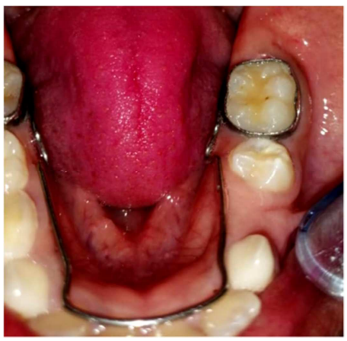

Figure 5. Two years postoperatively showing well realignment, development and eruption of the permanent premolars.

3. Discussion

In the primary dentition, radicular cysts were most frequently located at the periradicular and interradicular areas of mandibular primary molars, especially second molars [4, 7, 9]. With that in mind, the term Periradicular cyst might be more preferable than radicular cyst. Periradicular cysts in the primary dentition can easily be confused with Dentigerous cysts of the underlying permanent teeth, therefore, careful evaluation is needed otherwise mistakenly lead to the unwarranted extractions of the permanent teeth [9].

Periradicular cysts are usually well defined unilocular radiolucent lesions that are located both periradicularly and interradicularly which could be explained by the shorter roots and the presence of accessory canals [8]. Periradicular cysts associated with primary molars may appear following pulp therapy that might have been containing phenol groups as present in cresol and parachlorophenol or formaldehyde [7]. A relationship between medicaments used for pulp therapy and intraepithelial inclusions in the cystic walls [12] has been suggested. This may explain the presence of the foreign body inside the cystic cavity, as it may be antigenic and induce an immune reaction that leads to the development or expansion of the cyst [12]. When these cysts are associated with pulpal treated primary molars, they may appear as rapidly growing, large swellings with buccal expansion, may displace permanent teeth [7-9, 12] and could damage the development of the permanent teeth [7]. In few cases, sinus tracts are present [11].

There are no differences between Radicular and Dentigerous cysts with respect to their size, buccal bone expansion or displacement of adjacent permanent teeth. Even on histologically levels, it is difficult to differentiate between them [4, 7, 9]. When radiolucency is associated with primary molars, 50% to 73.5% were diagnosed as radicular cysts [3]. Azaz and Shteyer suggested that chronic irritation to the dental sac of the unerupted permanent tooth found under necrotic or pulpotomized primary teeth leads to the development of a Dentigerous cyst. Benn and Altini found that inflammatory exudates were induced by infection that spread to the dental follicle, causing separation of the reduced enamel epithelium from the enamel [13]. Establishing a positive diagnosis needs a clinical, radiological and histological correlation [4].

Several treatment options were seen such as non surgical endodontic treatment, enucleation and marsupialisation [11].Non surgical endodontic treatment can be done for small lesions. Enucleation can be done with extraction of the primary teeth with or without permanent teeth [1, 7], also with or without peripheral ostectomy [1]. Whereas marsupialization is done with or without packing the space in order to prevent premature closure of the wound [1].

When an aggressive surgical procedure is done, it involves high risk of damaging adjacent anatomical structures, such as the inferior alveolar neurovascular bundle, mandibular fracture and mandibular continuity defect [1]. However, as much as possible, the surgical treatment option should always be the least iatrogenic and conservative [6, 8].

Marsupialization, not enucleation of the cyst with extraction of the primary teeth and preservation of the permanent teeth, appears to be the most suitable treatment [2]. Permanent teeth are spontaneously aligned even when their initial positions are unfavourable [4, 7].

The major disadvantages of marsupialization are that pathological tissue is left behind and the frequent daily irrigation of the cavity [11]. Nevertheless, Marsupialization is a simple procedure and it is considered the first treatment option [6] and may be followed by enucleation, curettage, peripheral ostectomy, application of Carnoy's solution and liquid nitrogen - or a combination [1]. The co-operation of both patient and parents is critical for successful treatment [1, 6-8].

4. Conclusion

Marsupialization is a better and more practical approach for these cystic lesions in growing children. It requires less invasive intervention; therefore, comes with fewer risks, good healing and excellent prognosis in preserving permanent teeth realignment, development and vital structure protection.

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