

Management of Dentigerous Cyst in Children and Adolescents

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ABSTRACT

Background: The purpose of the present study was to evaluate the efficacy of marsupialization of dentigerous cyst in children and adolescents as a line of treatment and its role in involved teeth preservation, during the last three years in maxillofacial department, King Fahd specialist hospital, Qassim, Saudia Arabia.

Methods: twelve patients with dentigerous cysts were included in this study, 7 males and 5 females. Age range was 9 – 15 years old. Follow up to one-year postoperatively, early and late radiological evaluation. Followed by orthodontic alignment of teeth if needed.

Results: Marsupialization (decompression) is a reliable technique for management of dentigerous cysts in children and adolescents for cyst healing and involved tooth preservation, but it needs long periods of follow up, cooperative patient and sometimes orthodontic work up.

Conclusions: Marsupialization of dentigerous cyst should be considered in children and young adults, especially in large cysts and when tooth preservation is desirable.

Keywords

Dentigerous Cyst, Maxillary, Mandibular, Dental treatment.

Introduction

The dentigerous cyst is defined, as a cyst that originates by separation of the follicle from around the crown of unerupted tooth. It is the most common type of developmental odontogenic cyst. Its pathogenesis is uncertain; it occurs most commonly in the second and third decades of life and mostly affects the mandibular third molars. About 5% of dentigerous cysts occur around supernumerary teeth, mostly involves anterior maxillary mesiodens [1].

Dentigerous cyst comprises 14-20 percent of all jaw cysts, they are more frequent in males than females and considered of the common causes of destruction of these bones [2].

It is thought that dentigerous cyst arise from a change in the development of the reduced epithelium enamel organ, which

leads to accumulation of fluid between this and the crown of the permanent tooth, proliferation of the epithelium in a fluid filled sac may be induced by osmotic pressure during the extended period of time the tooth was impacted [3]. Third molars followed by maxillary canines (the most commonly impacted teeth), mandibular premolars, and occasionally supernumerary teeth or odontomas are involved in cyst formation [4].

There is usually no pain or discomfort associated with the cyst unless there is acute inflammatory exacerbation and usually discovered on routine radiographic examination or when films are taken to determine the reason for failure of a tooth to erupt, a dentigerous cyst is characterized by the attachment to the crown of unerupted tooth [5]. On radiographs, dentigerous cysts appear as a radiolucent, round, well-defined image that is in close relation to the crown of enclosed teeth [6].

Different treatment options are available for treatment of dentigerous cyst. The classic treatment option is the removal of the

whole cyst together with the affected tooth, to allow regeneration of healthy bone. Sometimes, this approach is too aggressive and more conservative options are required such as decompression or marsupialization, to allow eruption of the teeth related to the cyst [7].

Treatment of dentigerous cyst by conservative lines of management is recommended in children. Marsupialization (decompression) could be the best treatment and it is useful prior to extensive enucleation or curettage. Marsupialization (decompression) is a low invasive technique that could easily be conducted by any dentist, familiar with basic dental surgical procedures, aiming to remove the pathology and save the tooth involved in the cyst [8].

Materials

In this retrospective study, we chose 12 patients with dentigerous cysts, 9 mandibular and 3 maxillary. Their ages range from 9 to 15 years with mean age 12 years. 6 patients presented by painless jaw swelling, 3 patients presented by delayed eruption of permanent teeth, 3 patients discovered accidentally during radiological examination for other causes. Exclusion criteria were those with incomplete data or missing follow up X rays. We explained to the patients/parents and signed informed consent was taken from all of them. All patients were evaluated as regard history of any surgical interference, trauma to facial bones, dental interference for any procedure, and site of unerupted teeth.

Routine laboratory investigations were done. Preoperative radiological examination included OPG to all patients; CT scan was done for some cases. Photographs were taken preoperative and postoperative.

Surgical procedure

Prior to surgery, routine lab investigations had been done for all patients. All cases done under GA with nasal end tracheal intubation. Diagnostic aspiration was done routinely, by a syringe size 5 cc and showed thick whitish fluid. Retained primary teeth were extracted without disruption of the cyst lining. A muco-periosteal flap was reflected by sulcular and distal releasing incisions then a circular incision was done through mucosa covering the cyst and deepened to involve the bony cyst wall including part of the epithelial cyst lining for histopathological evaluation, then evacuation of the cyst fluid then copious irrigation with normal saline. Inspection of the impacted teeth, then homeostasis was done, suturing of the cyst wall with oral mucosa by simple interrupted sutures, suturing of the releasing incision, packing of the cyst cavity by a small piece of gauze soaked with fluidic acid to be removed 48 hours postoperatively.

The patients kept on parental antibiotics and analgesics for two days and discharged on oral antibiotics and analgesics for five days with oral hygiene instructions, with weekly follow up visit for irrigation with normal saline. Fourteen days postoperatively, the sutures removed .the biopsy results confirmed the diagnosis.

Results

Twelve patients from 9 to 15 years of age were included in this retrospective study. The average age was 12 year. There were 7 males and 5 females. Only one case had bilateral mandibular cysts. For all cases, the histopathological reports confirmed the diagnosis of dentigerous cysts. The patient's data were summarized in table 1. The follow up period was up to one and half year, after teeth eruption, 4 to 6 months postoperative the patients referred to the orthodontist to complete their treatment plan.

The follow up was clinical (gradual reduction of the cyst size), gradual eruption of the delayed tooth and radiological (substitution of the cyst cavity by bone). All cases had complete cyst healing with bony filling of the cyst cavity, eruption of the involved tooth and subsequent alignment in the dental arch spontaneously or by orthodontic aid. In one case (1/12) the involved tooth was loose with inadequate bony support and lost two weeks postoperatively. All patients had mild pain and discomfort during irrigation at the first month but disappeared gradually. Most of patients complained of the bad mouth odor but disappeared with time. Two cases had minimal postoperative bleeding and managed conservatively by irrigation and packing in this study, no major complications (such as pathological fracture, osteomyelitis, lip numbness or anesthesia complications.....) happened.

No	Sex	Age	Site	side
1	Male	11	Maxillary	Rt
2	Male	15	Mandibular	Lt
3	Female	14	Mandibular	Bilateral
4	Male	12	Mandibular	Rt
5	Female	13	Maxillary	Lt
6	Female	15	Mandibular	Lt
7	Male	9	Mandibular	Rt
8	Male	10	Mandibular	Lt
9	Male	12	Mandibular	Rt
10	Female	14	Mandibular	Rt
11	Female	11	Maxillary	Lt
12	Male	13	Mandibular	Rt



Preoperative OPG



4 months postoperative



9 months postoperative

Discussion

Dentigerous cyst can be defined as a cyst that encloses the crown of an unerupted tooth, expands the follicle and is attached to the cement enamel junction of the unerupted tooth. The majority of these cysts involve the mandibular third molars and the maxillary permanent canine, then mandibular premolars, maxillary third molars and less extent maxillary premolars. Dentigerous cysts most commonly occur in the second and third decades of life [9], but can also be found in children and adolescents with male predilection [10].

Surgery is commonly recommended for dentigerous cysts because, they often interfere with teeth eruption, become of large size, displace teeth, destroy bone, encroach on vital structures (displace the alveolar nerve, shrink the maxillary sinus) and rarely could lead to pathological fractures [11].

The nature of the causative tooth influences the type of surgical treatment required for the dentigerous cyst. If the cyst is associated with supernumerary or wisdom tooth complete enucleation of the cyst along with extraction of tooth may be the first treatment choice. However, when preservation of the tooth is desirable and in a young patient where the lesion is isolated, then marsupialization is the treatment of choice [12].

Treatment of dentigerous cyst depends on size, location, and disfigurement, and often requires variable bone removal to ensure total removal of the cyst, especially in cases of large cysts. This may even require Weber Ferguson incision as stated by Shah NJ. Nowadays, Scott-Brown has stated that marsupialization of the cyst lining is the treatment of choice for dentigerous cyst in children in order to give a chance to the unerupted tooth to erupt [13].

Marsupialization (decompression), a comparatively simple procedure, consists of surgically producing a window in the cystic wall to relieve intracystic tension. It has the following disadvantages: it could need a second stage, pathological tissue is left behind and a more sinister pathological process (i.e. squamous cell carcinoma) may be overlooked, and it takes a long period of time for the bone to regenerate in case of large cyst [14].

In this study, we chose the conservative modality of surgical treatment (marsupialization), for dentigerous cysts in children and adolescents, those young have a greater capacity to regenerate the bony structures than do adults do. So, we treated the pathological cyst and preserved the involved tooth in occlusion, with minimal surgical intervention. This modality of treatment need proper oral hygiene, close observation and follow up for longer time.

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