



Controversies In Management Of Dentigerous Cyst In Pediatric Population: A Case Report

Dr. Shalin Shah^{1*}, Dr.Ekta Mistry², Dr.Rushit Patel³, Dr.Vimesh Patel⁴, Dr.Ayesha Shaikh⁵

^{1*}Reader, Department of Oral and Maxillofacial Surgery ,Karnavati School Of DentistryGandhinagar
ORCHID:0000-0003-2950-1098

²Assistant Professor, Department of Oral and Maxillofacial Surgery ,Karnavati School Of
DentistryGandhinagar, ORCHID:0000-0001-8883-880

³Head of department, Department of Oral and Maxillofacial Surgery ,Karnavati School Of
DentistryGandhinagar

⁴Senior lecturer, Department of Oral and Maxillofacial Surgery ,Karnavati School OfDentistry,
Gandhinagar, ORCHID 0000-0002-3199-5384

⁵Post graduate student, Department of Oral and Maxillofacial Surgery ,Karnavati School
OfDentistry,Gandhinagar, ORCHID: 0000-0002-0286-1248

***Corresponding Author: Dr. Shalin Shah**

**Reader, Department of Oral and Maxillofacial Surgery ,Karnavati School Of DentistryGandhinagar
ORCHID:0000-0003-2950-1098*

Abstract

Dentigerous cysts are the most common developmental odontogenic cysts of the jaw, arising from impacted, embedded or unerupted permanent teeth. They apparently develop by accumulation of fluid between the reduced enamel epithelium and the tooth crown of an unerupted tooth. There is usually no pain or discomfort associated with the cyst unless there is an acute inflammatory exacerbation. Most frequently seen in 20-30 years of life. Cases which have been reported within 10 years of life, in mixed dentition period are hardly few in number. Various treatment modalities have been mentioned in the literature for management of dentigerous cysts. Here, we present an interesting case report of dentigerous cyst in pediatric patients. Complete removal of the cyst along with attached tooth structure was done under general anesthesia. Careful evaluation of the patient with past medical history, clinical, radiographic and histopathological examination would help the clinician in early diagnosis to administer appropriate treatment.

CC License

CC-BY-NC-SA 4.0

Keywords : Dentigerous cyst , pediatric population

Introduction

A dentigerous cyst (DC) is one that is formed by follicle expansion of an unerupted tooth enclosing its crown¹. Although noticed in wide age range, most commonly seen in between 20 and 30 years of life, less frequently below 10 years of age². Majority of the cases shows association with the impacted or unerupted mandibular molars, second most common site is maxillary canines followed by maxillary molars³. Most of the DCs are

painless unless secondarily infected, however mainly noticed during routine radiographic examination⁴. Dentigerous cysts are mostly associated with mandibular third molar tooth^{5,7,8}. Lin *et al.*⁹ reported the rate of third molar tooth being associated with DC as 45.3%, Zhanget *al.*⁵ as 77% and Jones *et al.*¹⁰ as 73.2%. Entities like unicystic ameloblastoma (50% of the cases) and ameloblastic fibroma (75% of the cases) have similarities in some aspects to DC such as, predilection to occur in children and young adolescents and frequently seen in association with unerupted or impacted tooth (75% of ameloblastic fibromas)^{5,9,11}. Radiograph alone cannot differentiate the above-mentioned lesions, thus a histopathological examination can help accurate diagnosis^{1,3}. Histologically, dentigerous cysts consist of a fibrous wall containing variable amounts of myxoid tissue and odontogenic remnants. The cyst is lined with nonkeratinized stratified squamous epithelium consisting of muco-sebaceous, ciliated and, rarely, sebaceous cells. The epithelial-connective tissue interface is typically flattened, but becomes highly irregular when associated with inflammation¹⁰. Pseudoepitheliomatous hyperplasia with thicker epithelium and acute and chronic inflammatory infiltrate are frequently found⁸.

Marsupialization is the treatment of choice, for dentigerous cysts involving unerupted favorably positioned teeth to contemplate for a smooth uneventful eruption of underlying teeth, however, for longstanding large lesions with teeth in unfavorable positions; enucleation of the cyst along with the removal of offending teeth remains the gold standard¹².

Possible complications arising from long untreated dentigerous cysts include:

1. Permanent bone deformation or pathologic bone fracture
2. Expansive bone destruction
3. Loss of permanent teeth
4. Development of squamous cell carcinoma, mucoepidermoid carcinoma and ameloblastoma¹³.

Management of dentigerous cysts in primary and mixed dentitions needs special consideration for meticulous preservation of the developing permanent tooth buds.

However, loss of a permanent tooth in the procedural management of a dentigerous cyst could be devastating to a child in more ways than one.

The aim of this report is to present a case series of two dentigerous cyst with one associated to an unerupted left mandibular third molar and other one with left second premolar and its surgical treatment in a pediatric patient.

Case Report one

Case 1: A boy aged 13 years came with the chief complaint of swelling over the left lower jaw region (Fig. 1). General examination confirmed that the patient was healthy, with no significant medical history. The clinical intraoral examination revealed swelling of size approximately 3*2cm extends from distal aspect of lower left canine till retromolar pad region along with obliteration of buccal vestibule in that region. Radiographic examination showed a large unilocular radiolucent area surrounding the crown of the unerupted mandibular second premolar. The roots of the vital second primary molar exhibited accelerated resorption and appeared to project into the lumen of the cystic cavity. Root of mandibular left first premolar is displaced. Cyst was enucleated surgically along with associated tooth under General anesthesia. Careful dissection of the inferior alveolar nerve was carried out.

The possibility of bone fracture and the safe change in the patient's mandibular growth was also assessed.



Figure 1 and figure 2 shows preoperative CBCT cystic lesion which involves resorption of roots of mandibular first molar and extension till mesial aspect of mandibular 2nd molar.



Figure 4. photograph shows the extension of lesion and crestal incision placement from mesial aspect of canine till mesial of mandibular 2nd molar.



Figure 5 and figure 6 shows the excised specimen and extraction of involved tooth which includes unerupted mandibular 2nd premolar , primary 2nd molar permanent 1st premolar and 1st molar and bony cavity seen after enucleation of lesion respectively.



Postoperative OPG

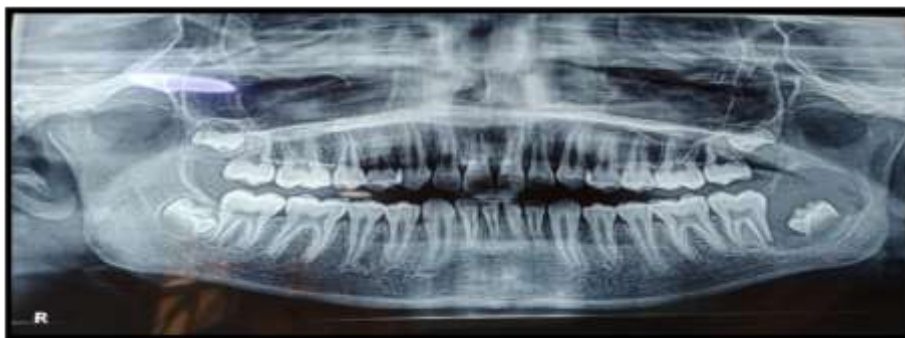
Case Report 2

Case 2: 10 years old boy was referred to Dept to Department of Oral and Maxillofacial Surgery due to swelling over left posterior lower jaw region since 1 month. He also complained of gradual increase in swelling and pain over that affected site since 3 days.

Intraoral clinical examination reveals swelling of size 3*3 cm extending from lower left premolar to retromolar pad region along with obliteration of buccal region. Tenderness was evident in that region with no signs of dental caries associated with any teeth over that site. Radiographic examination shows the unilocular radiolucency encircling the mandibular left third molar tooth germ which extends into angle and ramus region. When looking at clinical findings,

presumptions are made about dentigerous cysts. The patient was informed of the risks of the procedure, namely, the possibility of sensory nerve damage with fracture of the mandible, also of the possible necessity of a second procedure being required. Also, if at operation the appearance was indicative of a keratocyst or tumor, then a biopsy would only be performed. The fluid cyst contents clinically supported a diagnosis of a dentigerous cyst. Follow-up was noted to be less complicated and at one month

there was no pain, paresthesia or other complaints. Histopathological diagnosis confirmed the lesion to be a dentigerous cyst.



Figure[a] shows preoperative OPG with unilocular radiolucency encircling mandibular left third molar extending within ramus region with slight resorption of distal root of adjacent tooth noted.



Figures shows cystic enucleation and specimen enucleated along with tooth germ removal.

Discussion

Dentigerous cysts are odontogenic cysts that typically affect impacted teeth, in the majority of cases mandibular third molars and maxillary canines^{14,15}.

This case also presents other aspects that should be considered and which complicate the approach: various permanent germs and the inferior alveolar nerve are affected, as well as the possibility of pathologic fracture if a radical approach is carried out, etc.

The treatment for patients detected with dentigerous cyst of an inflammatory – type includes an impacted tooth should no longer be treated with enucleation. So, a multi-disciplinary approach employing marsupialization along with orthodontic traction of the associated impacted tooth can be planned as the treatment.

The treatment of large cystic lesions are mostly managed by marsupialization being most common. Evocyst is an attractive new approach for obtaining complete bone defect healing within 3 months.

Kimura et al. have developed a silicone based tube as a decompression device for the treatment of odontogenic cysts.

Various therapeutic options are considered with respect to the management of dentigerous cysts in children, which include the complete enucleation of these lesions with exodontia of the affected teeth, as well as other conservative options such as marsupialization, decompression either with or without traction of the tooth to its normal proper position in the arch.

The problems relating to cystic enucleation have been discussed, treatment that is more conservative that minimise the harm to the patient should be planned.

Yahara¹⁶ and Hyomoto¹⁷ have found that between 71.4 and 72.4% of the individuals were evident with natural eruption of teeth enclosed in the cyst after having approached with marsupialization.

Muramaki *et al.* published a case study about a dentigerous cyst belonging to a boy of twelve years, which was located on the same level as the lower left second premolar and which was treated through marsupialization.

Nyimi et al. has concluded that an initial approach, that is a conservative surgical approach with primary closure of the subsequent defect (less than 4 cm), reduces the morbidity of aggressive surgeries. It obtains the complete bone healing within twenty-four months of the postoperative period. The treatment of large cystic lesions when cases are carefully selected is marsupialization being most common. Evocyst is an attractive new approach for obtaining complete bone defect healing within 3 months.

Conclusion

Dentigerous Cysts are very uncommon in pediatric patients and, in the first decade of life with mixed dentition, an undiagnosed and untreated dentigerous cyst can lead to potential complications. A better prognosis can be expected in children as they have greater potential to regenerate bony structure than adults therefore, a thorough and timely evaluation of the patient history coupled with clinical and radiographic examination would help in early diagnosis and treatment.

In support of the treatment with enucleation in the management of the dentigerous cyst, the following are presented as advantages over other treatment options like marsupialization.

- A single procedure;
- Reduced risk of nerve damage;
- Reduced need for patient compliance in home care and follow-up;
- The entire cyst lining is made available for histopathology examination.

References

1. Kirtaniya BC, Sachdev V, Singla A, Sharma AK. Marsupialization: a conservative approach for treating dentigerous cyst in children in the mixed dentition. *J Indian Soc Pedod Prev Dent* 2010;28:203–8.
2. Bhardwaj B, Sharma S, Chitlangia P, Agarwal P, Bhamboo A, Rastogi K. Mandibular dentigerous cyst in a 10-year-old child. *Int J Clin Pediatric Dent* 2016;9(3):281.
3. Ikeshima A, Tamura Y. Differential diagnosis between dentigerous cyst and benign tumor with an embedded tooth. *J Oral Sci* 2002;44:13
4. Zhang J, Gu Z, Jiang L, et al. Ameloblastoma in children and adolescents. *Br J Oral Maxillofac Surg* 2010;48:549–54.
5. Neville BW, Damm DD, Allen DD, Bouquot JE. Odontogenic cysts and tumors. In: Neville BW, Damm DD, Allen DD, Bouquot JE, editors. *Oral and Maxillofacial Pathology*. 3rd ed. St. Louis: Saunders Elsevier; 2009 p. 678-740.
6. Koenig LJ, editor. *Diagnostic Imaging Oral and Maxillofacial*. Vol 2. Canada: Amirsys; 2012. p. 106-9.
7. Main DM. Follicular cysts of mandibular third molar teeth: Radiological evaluation of enlargement. *Dentomaxillofac Radiology* 1989;18:156-9.
8. Takeda Y. Ameloblastic fibroma and related lesions: current pathologic concept. *Oral Oncol* 1999;35(6):535–40.
9. 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;35:500-7.
10. Tsukamoto G, Sasaki A, Akiyama DM, Bhattacharyya I. Ameloblastic fibroma, ameloblastic fibro-odontoma, and odontoma. *Oral Maxillofac Surg Clin* 2004;16(3):375–84.
11. Farah CS, Savage NW. Pericoronal radiolucencies and the significance of early detection. *Aust Dent J* 2002;47:262-65.
12. Labben NG, Aghebeigi B. A comparative stereologic and ultrastructural study of blood vessels in odontogenic keratocysts and dentigerous cysts. *J Oral Pathol Med* 1990;19:442-46.
13. Shivaprakash PK, Rizwanulla T, Baweja DK, Noorani HH. Save-a-tooth: conservative surgical management of dentigerous cyst. *J Indian Soc Pedod Prev Dent*. 2009;27:52-7.
14. Bozdogan E, Cankaya B, Gencay K, Aktoren O. Conservative management of a large dentigerous cyst in a 6-year-old girl: a case report. *J Dent Child*. 2011;78:163-7.
15. Yahara Y, Kubota Y, Yamashiro T, Shirasuna K. Eruption prediction of mandibular premolars associated with dentigerous cysts. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2009;108:28-31.
16. Hyomoto M, Kawakami M, Inoue M, Kirita T. Clinical conditions for eruption of maxillary canines and mandibular premolars associated with dentigerous cysts. *Am J Orthod Dentofacial Orthop*. 2003;124:515-20.
17. Muramaki A, Kawabata K, Suzuki A, Muramaki S, Ooshima T. Eruption of impacted second premolar after marsupialization of a large dentigerous cyst: case report. *Pediatr Dent*. 1995;17:372-4.
18. Kimura M, Ishibashi K, Shibata A, et al. A new decompression device for treating odontogenic cysts using a silicone tube. *Br J Oral Maxillofac Surg* 2020;58(1):116-7.