

Dentigerous Cyst in Maxillary Sinus Region: A Case Report and Outline of Clinical Management for Paediatric Dentists.

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Abstract: Dentigerous cyst is a common developmental odontogenic cyst affecting both jaws but have higher predilection for mandible. It involves the crown of unerupted, impacted or embedded teeth. Pathogenesis involves accumulation of fluid between the unerupted or impacted tooth crown and surrounding follicle, giving rise to the characteristic clinical and radiographic finding of a cystic lesion surrounding the neck of the tooth. Careful evaluation along with meticulous clinical and radiological investigations could help clinicians to arrive at the correct diagnosis and appropriate treatment planning. This case report presents a boy 10 years old having dentigerous cyst in the left maxillary region with ectopic maxillary canine located below the roof of the orbit. Clinical and radiological features, cone beam computed tomography findings and histological features of the case are reported along with treatment done and the need for follow-up.

Keywords: Clinical management, dentigerous cyst, maxillary sinus, , paediatric dentists.

I. Introduction

A spectrum of jaw lesions affect children with different etiologies ranging from developmental aberrancy to neoplasia. The dentigerous cyst is a common developmental odontogenic cyst of the oral cavity. It accounts for the second most common cyst of the jaws comprising 14–20 per cent of all jaw cysts, with higher predilection for males and more common in the mandible.^{1,2} Pathogenesis of dentigerous cyst involves the accumulation of fluid between the unerupted or impacted tooth crown and surrounding follicle, giving rise to the characteristic clinical and radiographic finding of a cystic lesion surrounding the neck of the tooth. It can involve any included tooth, although molars and canines are the most affected ones. Cystic formation involving the crown of premolars and incisors is rare.³⁻¹¹ Though dentigerous cysts are benign odontogenic cysts associated with crowns of permanent teeth, some cases of these cysts being associated with deciduous teeth, and supernumerary teeth have also been reported.⁴ These cysts are often asymptomatic unless there is an acute inflammatory exacerbation and, therefore, these lesions are usually diagnosed during routine radiographic examination. Swelling, teeth displacement, tooth mobility, and sensitivity may be present if the cyst reaches a size larger than 2 cm in diameter.⁵ Radiographically, the dentigerous cyst shows a well-defined unilocular radiolucency, often with a sclerotic border, surrounding the crown of an unerupted tooth.⁶ Occasionally, trabeculations can be seen giving the appearance of a multilocular lesion. This cyst may involve adjacent teeth and may cause root resorption and/or displacement. The dentigerous cyst may enlarge and extend posteriorly to involve ramus, or anteriorly into the body of the mandible to involve roots of adjacent teeth. It can also expand into the antrum displacing involved teeth posteriorly or toward the orbital floor. 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 standard.⁷

II. Case Report

A 10 year-old boy reported to the Department of Pediatric and Preventive Dentistry, RUHS College of Dental Sciences, Jaipur, with a chief complaint of a painless swelling in the left upper jaw region since 3 months. The swelling had apparently enlarged over the preceding month, leading to facial asymmetry.[Fig.1] On general examination, the patient was apparently healthy. The past medical history was not significant and routine haematological investigations were within normal limits. Intraoral examination revealed a swelling which caused obliteration of buccal vestibule, extending from the left maxillary lateral incisor to the mesial of permanent first molar.[Fig.2] On the palatal side there were no signs of the swelling. The swelling was well defined, firm in consistency, mildly tender on palpation, and measured about 4 × 2 cm. The overlying mucosa was apparently normal with no signs of inflammation or serosanguinous discharge. Swelling was not compressible and no pulsations were felt. Neurological deficit was also absent. Oral hygiene was not adequate but teeth were free from any carious lesions. There was no history of trauma. Grade 1 mobility was present in relation to 63,64,65 although they were not sensitive to percussion.

In panoramic radiograph, a well-defined radiolucent image of the cyst, with sclerotic margins, extending from root of maxillary lateral incisor upto mesial root of first permanent molar mesiodistally and upper extension was upto lower orbital margin.[Fig.3] There was displacement of root of maxillary left lateral incisor towards the mesial side and canine was displaced towards the lower orbital margin. The roots of the deciduous canine, first and second molar showed resorption. First and second premolar teeth were also involved and left maxillary sinus was pushed backwards. Cone-beam computed tomography was also performed and revealed a cystic cavity extending into the left maxillary sinus and involvement of maxillary canine which was present just below the lower margin of orbital rim.[Fig.4]

Enucleation of the cyst was done under general anaesthesia after carrying out routine investigations which were within normal limits. A mucoperiosteal flap was raised from left maxillary lateral incisor to first permanent molar region and the cystic lining along with the ectopic tooth was detached from cavity walls carefully.[Fig5,6] Retained deciduous canine, first and second molars were also extracted. Second premolar tooth bud was extracted as the bony walls were destroyed. Primary closure was done after achieving haemostasis. The enucleated tissue was sent for histopathological examination to confirm the diagnosis of dentigerous cyst.

The gross specimen consisted of a flattened greyish brown cystic mass measuring approximately $3.5 \times 2.0 \times 1.0$ cms containing the developing canine tooth bud within it. The microscopic study was consistent with the diagnosis of the dentigerous cyst. The histological examination showed a benign cyst lined by nonkeratinized stratified squamous epithelium with presence of anucleate keratinous material in the lumen. Surrounding fibrous tissue showed mild lymphocytic infiltration.[Fig.7]

The post-surgical period was uneventful and sutures were removed on seventh day. Follow-up panoramic radiograph showed good bony healing.[Fig.8] Nance palatal arch holding appliance was delivered to act as a space maintainer. Longer follow-up periods were advised to the patient for prosthetic and orthodontic rehabilitation.[Fig.9]

III. Discussion

Dentigerous cyst is an odontogenic cyst associated with crown of an unerupted tooth. Mandibular third molars are the most frequently involved teeth.⁸ In present case report the cyst was associated with impacted maxillary canine. Pathogenesis of dentigerous cyst has not been clear yet. Mainly there are two theories suggested for the formation of dentigerous cyst. It can be inflammatory or non-inflammatory. Inflammatory type occurs in immature teeth as a result of inflammation from a non-vital deciduous tooth. Bloch⁹ suggested that the overlying necrotic tooth results in periapical inflammation which spreads to involve the dental follicle of the unerupted permanent successor. It leads to formation of inflammatory exudate and results in dentigerous cyst formation. The other type, non-inflammatory dentigerous cyst, develops by pressure exerted by an erupting tooth on an impacted follicle. The pressure build-up results in obstruction of the venous outflow and thereby induces rapid transudation of serum across the capillary wall.¹⁰ This transudation process leads to accumulation of fluid either between the reduced enamel epithelium and enamel or in between the layers of the enamel organ, thus formation of dentigerous cyst. It has been suggested that the likely origin of the dentigerous cyst is the breakdown of proliferating cells of the follicle after impeded eruption. These breakdown products result in increased osmotic tension and hence cyst formation.¹¹ Since there was no carious tooth present in the oral cavity, our case might be classified as non-inflammatory type.

Ectopic teeth in the maxillary sinus may result in obstruction in the canals of the sinus and chronic sinusitis.¹² In the present case there were no symptoms indicating sinusitis in spite of the ectopic canine encroaching the maxillary sinus below the orbital floor. While ectopic molars and supernumerary teeth have been more commonly reported in the maxillary sinus, ectopic permanent canines were less frequently encountered.^{13,14}

The treatment of dentigerous teeth depends on the cyst size, angulation and location of involved tooth, patient's age, disfigurement and several other factors. Although in young patients marsupialisation and decompression are preferred over enucleation, in large lesions with impacted tooth in unfavourable position with no chance of eruption, enucleation remains the gold standard of treatment.¹⁵ In the present case, as the tooth was displaced up to the roof of the maxillary sinus far from the alveolar arch with a questionable viability, enucleation with the removal of the displaced tooth was favoured. Palatal arch holding appliance was delivered to the patient to prevent the mesial migration of permanent first molar so that the future prosthetic rehabilitation would be easier.

IV. Conclusion

Dentigerous cyst involving ectopic maxillary canine in the roof of maxillary sinus may demand a more definitive treatment rather than a conservative one. A thorough understanding of the nature of the lesion along with a good clinical history and proper diagnosis with conventional radiography supplemented with cone beam computed tomography can help the clinician to arrive at the correct therapeutic choice of approach. Pedodontist should consider the long term follow-up of the young patients and the transitional treatment like space management to aid in the definitive treatment in future.

References

- [1]. Assael L A. Surgical management of odontogenic cysts and tumors. In Peterson L J, Indresano T A, Marciani R D, Roser S M. Principles of Oral and Maxillofacial Surgery. Philadelphia: JB Lippincott , 1992, Vol 2, pp685-688.
- [2]. Neville B W. Odontogenic cysts and tumors. In Neville B W, Damm D D, Allen C M, Bouquot J E. Oral and Maxillofacial Pathology. Philadelphia: WB Saunders, 1995, pp493-496.
- [3]. Manoela Carrera, Danilo Borges Dantas, Antônio Marcio Marchionni, Marília Gerhardt de Oliveira, Miguel Gustavo Setúbal Andrade. Conservative treatment of the dentigerous cyst: report of two cases. Brazillian Journal of Oral Sciences 2013;12(1):52-56.
- [4]. Most DS, Roy EP. A large dentigerous cyst associated with a supernumerary tooth. J Oral Maxillofac Surg 1982;40:119-20.
- [5]. Bodner L, Woldenberg Y, Bar-Ziv J. Radiographic features of large cysts lesion of jaws in children. Pediatric Radiology 2003;33:3-6.
- [6]. Kalaskar R. R, Tiku A, Damle S. G. Dentigerous cysts of anterior maxilla in a young child: A case report. J Indian Soc Pedod Prevent Dent - December 2007;187-190.
- [7]. Bhat S. Unusual presentation of dentigerous cyst in a young child: a case report. J Indian Soc Pedod Prevent Dent march 2001;21-23.
- [8]. Frer AA, Friedman AL, Jarrett WJ, Brooklyn NY. Dentigerous cyst involving the maxillary sinus. Oral Surgery 1972; 34:378-80.
- [9]. Bloch JK. Dentigerous cyst. Dent Cosm 1928; 70:708-11.
- [10]. Main DM. The enlargement of epithelial jaw cyst. Odontol Revy 1970; 21:21-9.
- [11]. Toller PA. The osmolarity of fluid from the cyst of jaw. Br Dent J 1970; 129:275-8.
- [12]. Goh YH (2001)Ectopic eruption of maxillae molar tooth - an unusual cause of recurrent sinusitis, singapore Med J 42,80-81.
- [13]. Atlas E, Karasen RM , Yilmaz AB , Aktan B , Kocer I, Erman Z (1997) A case of large dentigerous cyst containing a canine tooth in the maxillary antrum leading to epiphora.J Laryngol Otol 111, 641-643.
- [14]. Edwards JL , Ferguson JW (1976) Ectopic maxillary canine . NZ Dent J 72 , 33-34.
- [15]. M Zakirulla, CM Yavagal, DN Jayashankar, Allahbaksh Meer. Dentigerous Cyst in Children: A Case Report and Outline of Clinical Management for Pediatric and General Dentists. Journal of Orofacial Research, October-December 2012;2(4):238-242

Figures



Fig. 1. Extraoral view showing swelling on left paranasal and cheek region



Fig. 2. Pre-operative intraoral view



Fig. 3. Pre-operative orthopantomograph showing radiolucency in left maxillary region



Fig.4. CT scan showing cystic cavity along with the impacted tooth

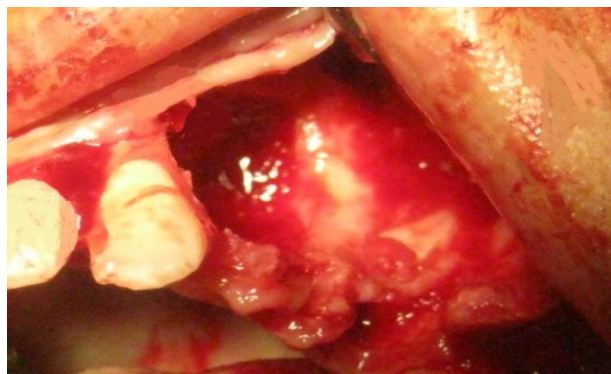


Fig. 5. Intra-operative view after enucleation of cyst



Fig. 6. Tissue specimen along with impacted maxillary canine

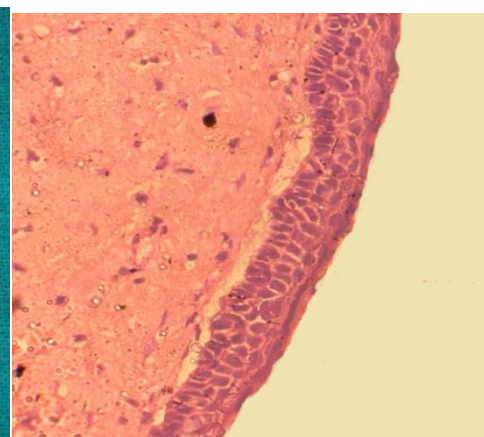


Fig. 7. Photomicrograph of the cyst

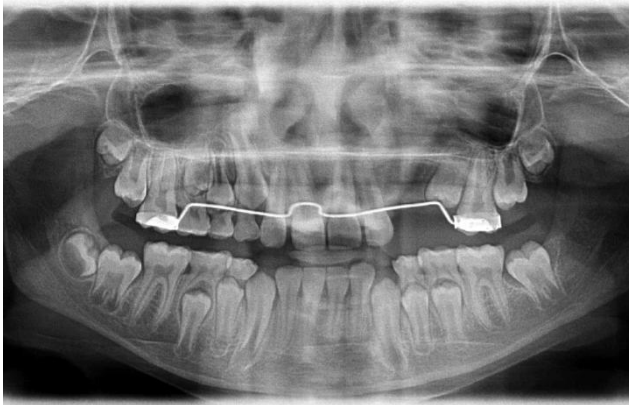


Fig. 8. Post-operative orthopantomograph



Fig. 9. Post-operative intraoral view after insertion of Nance palatal arch holding appliance