

Dentigerous Cyst Involving the Maxillary Sinus – Report of a Case with Review of Literature

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Abstract

Ectopic eruption of tooth in the maxillary sinus has been mentioned in the literature. A tooth may erupt in maxillary sinus and present with chronic sinusitis, inflammation with purulent discharges, and nasal obstruction. Formation of cyst in the maxillary sinus and obstruction of nasolacrimal canal leading to epiphora may occur in certain cases. We present a case of dentigerous cyst associated with an ectopic maxillary third molar tooth in the left maxillary sinus cavity. The presence of dentigerous cyst in the maxillary sinus, along with an impacted maxillary third molar, has been rarely documented. Investigations and management of the cyst with brief review of various management protocols are discussed here.

Keywords: Dentigerous cysts, Enucleation, Marsupialization, Maxillary sinusitis.

INTRODUCTION

Dentigerous cyst is a form of odontogenic cyst which develops by the accumulation of fluid between reduced enamel epithelium and crown of the unerupted tooth after its crown has fully formed.^[1] The dentigerous cyst was coined by Paget in 1853.^[2] Dentigerous cyst is the second most common odontogenic cyst, next to radicular cyst. The teeth most involved is mandibular third molars followed by maxillary permanent canine, mandibular premolars, and maxillary third molars in descending order of occurrence.^[3] They are two times common in males than in females. About 70% of dentigerous cysts occur in the mandible and 30% in the maxilla. The mandibular third molar and maxillary canines are involved most often, followed by the mandibular premolars and the maxillary third molar.^[4] Ectopic eruption of a tooth in the dental environment is common, whereas ectopic eruption of a tooth in other site is rare. Maxillary sinus is one such site for ectopic tooth eruption in a non-dental location. Ectopic eruption may result due to one of the three processes which are developmental disturbances, pathological processes, or iatrogenic activity. Tooth eruption into the maxillary sinus may cause sinus infections and result in cyst formation, mainly a dentigerous cyst. We present a case of an ectopic maxillary third molar, which presented in the left maxillary sinus with cyst formation in the sinus and purulent nasal discharge treated by surgical removal of tooth and cyst enucleation.^[5,6]

CASE REPORT

A 31-year-old female patient reported with a chief complaint of headache and pain in relation to the left side of face. The patient had pain since 2 years, associated with purulent and pungent smelling nasal discharge. Despite taking antibiotics and analgesics from medical practitioners, the clinical symptoms persisted that pain was sharp, lancinating, and continuous in nature radiating to entire left maxilla. Pain aggravated on bending forward, sneezing, and chewing. The patient experienced fullness and pressure on the sinus wall of that side. The patient was moderately built and nourished and did not have any other relevant medical history. On clinical examination, the right and left maxillary third molar were missing. A computed tomography (CT) scan, OPG, and PNS view were advised. This revealed the presence of an ectopically erupted tooth within the sinus cavity associated with well-defined radiolucent lesion suggestive of a cyst on left side and impacted maxillary third molar on the right side under OPG and PNS view. The Coronal section of CT at the level of the

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maxillary sinus showed a definite hyper dense area of size 25 × 14 mm in the lateral wall of the left maxillary sinus with a tooth (Figure 1). This suggested the possibility of dentigerous cyst.

The condition was treated by enucleation of the cyst and surgical removal of impacted tooth under GA. Procedure was done under nasal intubation. Local anesthetic infiltration was given in the buccal vestibule on the left side. Vestibular incision was placed from 23 to 28. Mucoperiosteal flap was raised. The impacted tooth was identified (Figure 2). Bone trephining around the tooth was done. The tooth was luxated and elevated. Cystic lesion was enucleated along with tooth (Figure 3). The sinus lining was removed and the sinus lavage was done. Specimen was sent for histopathological examination. The sinus lining was curetted and irrigated. Flap closure was done with 3-0 vicryl. Impacted tooth on the opposite quadrant was also removed. This was followed up with the usual antibiotics, analgesics, steam inhalation, and nasal decongestants.

Histopathological report confirmed dentigerous cysts with a lining of a layer of non-keratinized stratified squamous epithelium, 5–6 cell thickness with a surrounding wall of thin connective tissue. The inner wall of the cyst was covered with

stratified squamous epithelium and ciliated columnar cells (Figure 4).

DISCUSSION

The term dentigerous cyst was coined by Paget in 1853. It is the most common type of developmental odontogenic cysts arising from the crowns of impacted or unerupted tooth. It basically implies a tooth bearing cyst. Dentigerous cysts associated with supernumerary teeth as in the case presented constitute 5–6% of all dentigerous cysts.^[7] They are usually seen in age groups between 30 and 40 with no sex predilection. About 70% occur in mandible and 30% in maxilla as in our case.^[8] Majority of dentigerous cyst involve mandibular third molars followed by maxillary permanent canine, mandibular premolars, and maxillary third molars. Dentigerous cyst associated with an ectopically erupted tooth within the maxillary sinus is a very rare occurrence.^[8] Those dentigerous cysts caused by an impacted tooth localized in the anterior maxilla account for only 5.5% of all the cases, while those that spread into the maxillary sinus are even more rare.

Dentigerous cysts are usually painless but may result in facial swelling and delayed tooth eruption. If dentigerous cyst gets infected, it shows inflammatory symptoms such as facial swelling and sensory changes. Fistula formation can occur especially when the cyst is present in maxillary sinus presents itself as sinusitis with purulent discharges.^[9] Dentigerous cysts



Figure 1: CT coronal section



Figure 2: Identification of the cyst along with the impacted tooth



Figure 3: Excised cystic lesion with the tooth

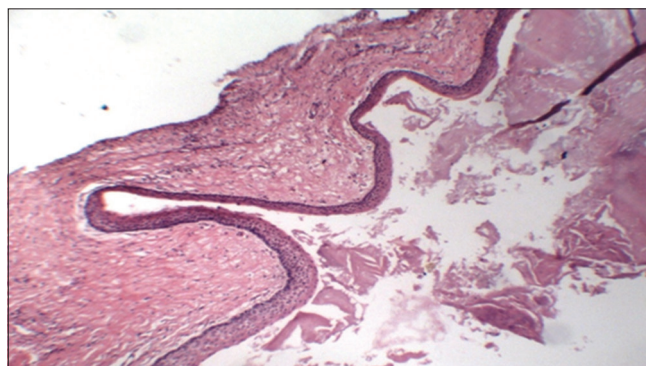


Figure 4: Histopathology

present usually as single lesions. Bilateral and multiple cysts have been reported in patients with syndromes such as basal cell nevus syndrome and cleidocranial dysplasia.^[10]

Dentigerous cysts in the maxillary sinus are easy to detect radiographically due to their dense opacity.^[11] Usual panoramic radiographs are only indicated. They are very effective in distinguishing the existence of a tooth, if any, along with the cyst. CT scan can also help to detect bony structures and understand the definite size or content of the lesions in the maxillary sinus.^[12]

The enlargement of the cyst is associated with the proliferation of the epithelial cells, release of bone resorbing factors, and the osmolality of the fluid within the cyst.^[13] Therefore being asymptomatic, dentigerous cyst can manifest itself with swelling on the face, rhinorrhea with pus, and purulent discharge as seen in our case, obstruction, and epiphora when involving the maxillary sinus.^[14-16] There are cases where large dentigerous cysts in the maxillary sinus led to diplopia and nasolacrimal duct obstruction.^[2]

Histopathologically, these cysts are lined by a layer of non-keratinized stratified squamous epithelium, with a surrounding wall of thin connective tissue. The inner wall of the cyst is covered with stratified squamous epithelium and ciliated columnar cells. On rare occasions, squamous cell carcinoma, mucoepidermoid carcinoma, or ameloblastoma can develop in dentigerous cysts.^[17]

Differential diagnoses include odontogenic keratocyst, calcifying epithelial odontogenic tumor, and variants of ameloblastoma.^[18]

The standard treatment protocol for a dentigerous cyst is removal of the cyst in total by enucleation and extraction of the involved impacted tooth or the supernumerary.^[18] In case of dentigerous cyst associated with an ectopic tooth in the maxillary sinus, the gold standard is Caldwell-Luc antrostomy.^[18] Marsupialization can be tried in cases, where the cyst is too large and when involving other osseous structures. Marsupialization can preserve the cyst associated tooth and promote its eruption in case, where there is space for the teeth to erupt into the oral cavity.^[19] Chance of recurrence is the drawback of marsupialization. Waldrons procedure has also been mentioned in the literature as well, where the cystic contents are first marsupialized to remove the pressure and volume of the cyst followed by enucleation at a later stage when the cyst has shrunk.^[19]

Cases have been reported, where marsupialization was successfully used to minimize the amount of maxillary destruction and surgical morbidity compared with immediate enucleation of the lesion for dentigerous cysts within the maxillary antrum. Although the traditional Caldwell-Luc procedure provides a direct view into the maxillary sinus, it is associated with more morbidity than transnasal endoscopy.

Transnasal endoscopic sinus surgery involves minimal surgical invasion with maximal reductive changes. There are few complications and damages to the surrounding hard tissues. A secondary surgery, enucleation is required at a later stage.

CONCLUSION

Occurrence of dentigerous cyst in the maxillary sinus is very rare. In that case, it will be associated with an ectopically erupted tooth in the sinus. Enucleation of the cyst with the removal of the impacted tooth is the treatment of choice. Post-operative period was uneventful. The patient was relieved of nasal discharge and headache.

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