

Ectopic Tooth in the Maxillary Sinus and Chronic Recalcitrant Rhinosinusitis

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Abstract

Introduction: Intramaxillary sinus ectopic tooth associated with a dentigerous cyst is a rare occurrence. Ectopic teeth do not need to be removed if they are asymptomatic. In symptomatic patients a combined approach - Caldwell-Luc and Endoscopic wide medial antrostomy - can be used to completely excise the dentigerous cyst and ensure adequate drainage of the maxillary sinus.

Material and Methods: Case report and literature review

Results: A 54 year old Caucasian female presented with a few years history of right sided facial pain, nasal obstruction, postnasal drip and hyposmia. She had undergone Endonasal inferior nasal antrostomy / Caldwell luc surgery 10 years ago. Nasal endoscopy revealed mucopurulent discharge in her right middle meatus. The CT scan of her paranasal sinuses revealed bilateral severe mucoperiosteal disease affecting most of her sinuses, a right Haller cell, and also showed evidence of previous sinus surgery. Incidentally, left sided dentigerous cysts and two ectopic teeth were seen in the left maxillary sinus. Even with maximal medical therapy, her symptoms failed to resolve. She underwent septoplasty and right functional endoscopic sinus surgery (FESS). The post-operative recovery was smooth and she reported complete resolution of her symptomatology on the right side. Two months later she developed persistent left sided facial pain associated with maxillary facial swelling. A course of oral antibiotics failed to improve the situation. After consultation with the maxillofacial colleagues, the dentigerous cyst and the ectopic tooth were removed using a combined endoscopic Caldwell-Luc approach. Only the infected ectopic tooth was removed. The other ectopic tooth was left in situ as it was covered by healthy bone. No postoperative complications were encountered. The patient made a good and complete recovery with resolution of her symptoms.

Conclusions: Chronic recalcitrant sinusitis is significantly associated with dental etiology.

A combined approach-FESS/Caldwell Luc provides better access, better visualization and facilitates complete removal of the disease pathology from the maxillary sinus. We recommend the above procedure for recalcitrant maxillary sinusitis of dental origin.

Keywords: ectopic tooth, unilateral, maxillary sinus, recalcitrant chronic rhinosinusitis

INTRODUCTION

Intramaxillary sinus ectopic tooth associated with a dentigerous cyst is a rare occurrence. A common site for ectopic tooth to occur associated with this pathology is in the maxillary sinus. Although the eruption of an ectopic tooth in the maxillary sinus is not fully understood, there are many aetiologies which have been implicated, which will be discussed in this article.

The majority of cases of ectopic teeth in the maxillary sinus do not present with symptoms and are mainly discovered incidentally on investigations. However, cases that are symptomatic present with local disease such as sinusitis. Ectopic teeth do not need to be removed if they are asymptomatic. In symptomatic patients a combined approach, Caldwell-Luc and endoscopic wide medial antrostomy, can be used to completely excise the dentigerous cyst and ensure adequate drainage of the maxillary sinus.

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In this case report we present a case of an ectopic tooth in the maxillary sinus associated with recalcitrant chronic rhinosinusitis.

CASE REPORT

A 54 year old Caucasian female presented with a long-standing right-sided facial pain, nasal obstruction, postnasal drip and hyposmia. She had undergone endonasal inferior nasal antrostomy / Caldwell-Luc surgery 10 years ago. Nasal endoscopy revealed mucopurulent discharge in her right middle meatus. The CT scan of her paranasal sinuses confirmed bilateral severe mucoperiosteal disease affecting most of her sinuses (Fig. 1). There is also evidence of previous sinus surgery. Incidentally, a left-sided dentigerous cyst with two ectopic teeth were seen in the left maxillary sinus. Even with maximal medical

therapy, her symptoms failed to resolve. She underwent septoplasty and right endoscopic sinus surgery (ESS). The post-operative recovery was smooth and she reported complete resolution of her symptomatology on the right side. Two months later she developed persistent left sided facial pain associated with maxillary facial swelling. A course of oral antibiotics failed to improve the situation. After consultation with the maxillofacial colleagues, the dentigerous cyst and the ectopic tooth were removed through a combined endoscopic and Caldwell-Luc approach (Fig. 2). Only the infected ectopic tooth was removed. The other ectopic tooth was left in situ as it was covered by healthy bone. No postoperative complications were encountered. The patient made a good and complete recovery with resolution of her symptoms.

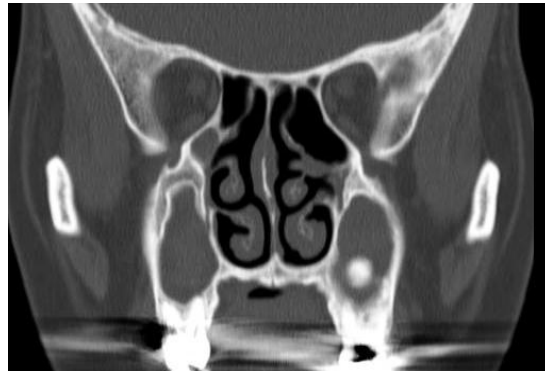


Fig1. CT scan of paranasal sinuses showing opacification of bilateral maxillary sinuses and an ectopic tooth in left maxillary sinus.

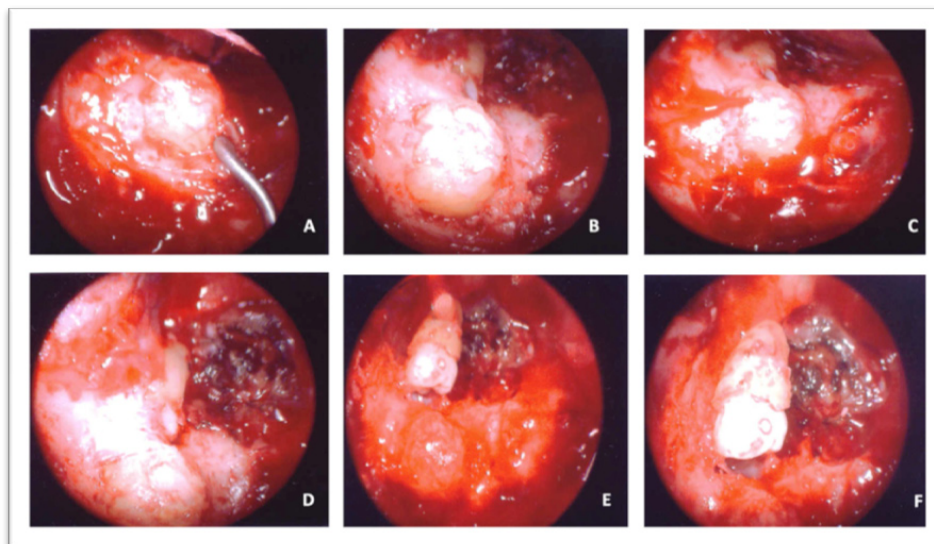


Fig2. The ectopic tooth on the lateral aspect of the left antral floor was removed through a combined endoscopic and Caldwell-Luc approach. The tooth was embedded in chronically inflamed sinus mucosa (A-C). Careful dissection was carried out to remove the affected tooth (D-F) and the unhealthy mucosa surrounding this was stripped to enable healthy mucosa regrowth.

DISCUSSION

Tooth development is the result of a number of interactions between the underlying tissue and the oral epithelium. A multitude of inter-dependent interactions exist in order for the development of a healthy set of teeth. However, abnormal tissue interactions may occur during the development process which have the potential to result in the eruption of ectopic tooth (1).

Ectopic tooth in the maxillary sinus is a rare phenomenon and has only been reported in literature 35 times since 1927 (7). Although the absolute aetiology of ectopic tooth in the maxillary sinus is unknown; it is widely believed that ectopic eruption of a tooth can be attributed to one of three main causes which include iatrogenic activity, failure of normal development and a disease process such as tumor or cyst. Other theories include genetic factors, crowding, dense bone, cleft palate and displacement of teeth secondary to trauma (2). In our case, we believe the cause for the development of the ectopic teeth are due to overcrowding of the patient's molars due to her slightly narrow maxilla.

Ectopic tooth eruption in dental structures occurs fairly commonly, however it is a relatively rare occurrence in other sites such as the maxillary sinus. Apart from the maxillary sinus, other sites where ectopic tooth eruption has been reported include the palate, mandibular condyle, nasal cavity, coronoid process and orbita (3).

Majority of ectopic tooth in maxillary sinus are diagnosed incidentally on routine clinical and radiological investigation in asymptomatic patients. Ectopic tooth, however, can form odontogenic cysts as seen in our patient. This in turn can lead to degradation of its bony covering turning this into a focal source of infection resulting in chronic rhinosinusitis or recurrent sinusitis (4). These patients often present with unilateral facial pain, mucopurulent discharge, frontal headache, cacosmia, post-nasal drip and a foul taste at the back of their throat with clinical history of either temporary improvement or failing to respond to antibiotic treatment as is with our patient.

Dentigerous cysts are odontogenic lesions which arise from the crown of the unerupted or impacted teeth, although the pathogenesis is not fully clear. It has been postulated these cysts arise from dental follicles,

due to accumulation of fluid between the tooth crown and epithelial components. The most commonly implicated teeth in ectopics are the maxillary canine and mandibular third molar (5). Dentigerous cysts that surround impacted teeth often displace the teeth into ectopic positions. Therefore the teeth in the maxilla are displaced into the maxillary sinus as seen in our case.

Dentigerous cysts are the most common type of odontogenic cysts and the second most common type of cystic lesions of the jaw. They are associated with ectopic teeth in the maxilla and only 17 cases are said to have been reported since 1980 (8).

These have been reported to occur most commonly in the age ranged from 4 to 57 years old, with a mean age of 24.7 years. Published literature also displays a higher incidence in men, than in women (9). These cysts are often indolent cysts with a relatively slow progression. It has been reported that they can present with delayed tooth eruption and facial swelling (9). Therefore, its' true incidence is unknown. Patients are often diagnosed when the ectopic tooth becomes the focal source of sinusitis as is in our patient. The typical clinical presentation of an ectopic tooth causing chronic rhinosinusitis is facial swelling and pain, nasolacrimal obstruction and headache (10).

The diagnosis of odontogenic cyst with its associated ectopic tooth can be easily established radiologically with a simple orthopantomogram. A more detailed assessment of its relation to the maxillary sinus and associated sinus disease will require a cone beam computed tomogram (CBCT). A CT scan can also show the extent of the sinus infection and establish whether there is nasal or orbital involvement (11). Therefore, it is stipulated that CT scanning is the most useful due to aiding diagnosis as well as localisation of the ectopic tooth and surgical planning.

The definitive treatment for chronic sinusitis caused by ectopic tooth is surgery. Although great stride had been made with endoscopic surgery in the last two decades (12), the combined approach remains the current gold standard due to the limited access with the endoscopic technique and often the offending tooth can be quite embedded in an awkward location on the floor of the antrum. The standard treatment for a dentigerous cyst is a enucleation and extraction of the associated ectopic tooth. Combining a Caldwell-Luc and a wide middle meatal antrostomy created

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endoscopically can be used to completely excise the dentigerous cyst and ensure adequate drainage of the maxillary sinus (6). Care must be taken not to injure the infra-orbital nerve when performing Caldwell-Luc to avoid unnecessary morbidity to patient.

CONCLUSIONS

Chronic recalcitrant sinusitis can be associated with dental aetiology. Enucleation of the odontogenic cyst with extraction of the offending ectopic tooth is necessary for complete resolution of symptoms. In this case, a combined endoscopic and Caldwell-Luc approach has provided a better access, better visualisation of the pathology and also helps to facilitate complete removal of the disease pathology from the maxillary sinus. The combination of endoscopic and open approach should be considered for more complex and challenging access cases.

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