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Rare Presentation of An OKC Involving The Ectopic Maxillary Third Molar in The Sinus and its Management

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ABSTRACT

Ectopic development of teeth in non-tooth bearing areas is uncommon, especially in the maxillary sinus. We report a case of a 27-year-old male patient who presented with purulent discharge posterior to the upper right second molar with a bad taste and foul odour. An orthopantomography is the routine diagnostic radiographic examination performed for this type of eruption, although cone beam computed tomography (CBCT) is highly recommended for further localization of the ectopic tooth and assessment of the characteristics of any associated lesion before a surgical procedure. Radiographic examination revealed right maxillary third molar tooth located at the posterosuperior aspect of the right maxillary sinus with a hyperdense lesion surrounding the crown, obliterating the sinus cavity. Both the tooth and infected odontogenic keratocyst were surgically removed under general anaesthesia through Caldwell-Luc antrostomy. After a one-month follow-up, the patient was symptom free and had an uneventful recovery.

One of the most frequent conditions affecting the oral and maxillofacial areas are odontogenic cysts.

1. INTRODUCTION

Teeth that are ectopic are those that are not in the alveolar arch but rather in the jaw bones or other areas. The rare location of the ectopic third molar surrounded by the infected odontogenic keratocyst cyst is an indication for its complete surgical removal to avoid complications as recurrence or malignant transformation[1].

In some cases of teeth erupting in the nose, coronoid process, mandibular condyle, and maxillary sinus which are documented in literature are typically linked to dentigerous cysts, which can partially or completely obliterate the sinus cavity and cause a variety of symptoms. This class of lesions is caused by inflammation-induced odontogenic epithelial growth. The cause of inflammation is apical periodontitis, which develops when a tooth dies and the pulp becomes necrotic. Periradicular tissues with persistent inflammation give rise to periapical granulomas and promote the growth of Malassez's epithelial rests. Central degeneration and necrosis ensue, creating a hollow that is eventually lined with epithelium.Hydrostatic pressure then causes the cyst to expand as the material gathers in the center[2].

Ectopic eruption of teeth into dentate regions is relatively common, but such a condition in non-dentate areas like the mandibular ramus and sigmoid notch and maxillary sinus or nasal cavity is rare[3].

The most recent assessment of the literature found that 51 patients had ectopic teeth in the maxillary sinus, with 21 occurrences of ectopic teeth in the third molars reflecting the higher prevalence[4]. The tooth may occasionally erupt into the maxillary sinus without causing any symptoms[5]. can result in symptoms including headache, face pain, rhinorrhea, sinusitis, or edoema[6]. In this instance, the patient had been experiencing purulent discharge distal to the upper second molar for two years. A cystic lesion and an ectopic third molar were visible on CBCT. According to certain studies, because panoramic radiography accurately detects ectopic instances and exposes patients to low radiation levels, it is the preferred radiographic examination in these situations. However, due to the superimposition of various bony structures, the primary drawback of two-dimensional panoramic radiography is the challenge in precisely identifying the site of the ectopic tooth and the accompanying disease[7].

In comparison to multi-slice CT scans, computed tomography (CBCT) delivers precise three-dimensional imaging with sub-millimeter resolution, a quick scanning duration, and a radiation dose that is up to fifteen times lower. Our case's CBCT evaluation demonstrated the precise length and impact of the accompanying cystic lesion on the surrounding structures, as well as our ability to correctly pinpoint the ectopic molar . Due to the close closeness to the orbital floor and pterygoid plates, this helped the surgeon during the surgical process and enabled the preoperative diagnosis of the cause of the purulent discharge.In order to reduce the patient's exposure to radiation, the narrowest field of view that met the clinical indication was advised[8].

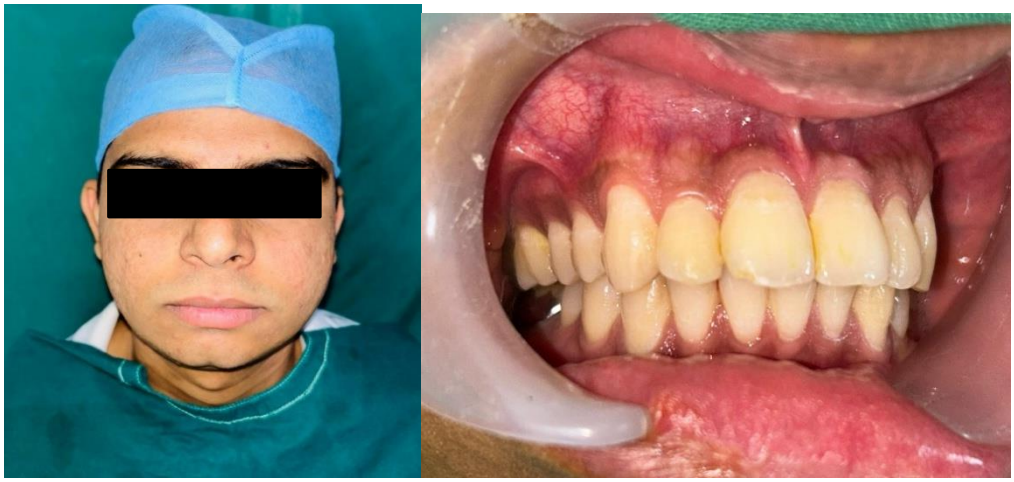
The dentigerous cysts are the most common pathologic lesion associated with ectopic eruptions[9]. Many oral and maxillofacial cysts might be discovered as incidental radiography findings and are asymptomatic.Others, meanwhile, have the potential to seriously deform the bone, shift teeth, and result in pathological fractures.

2. CASE REPORT

Initial presentation

A 27 year old male patient reported to the outpatient department of oral and maxillofacial surgery, Bharati vidyapeeth dental college and hospital, sangli with the chief complaint of chronic purulent discharge just distal to the upper right second molar, with a bad taste and foul odour since 2 years.

Upon clinical examination, the patient had no intraoral or extraoral edema or pain and there was a full complement of teeth on that arch except for teeth #18 and #28. All teeth were firm, vital and non-carious. (Figure 1).

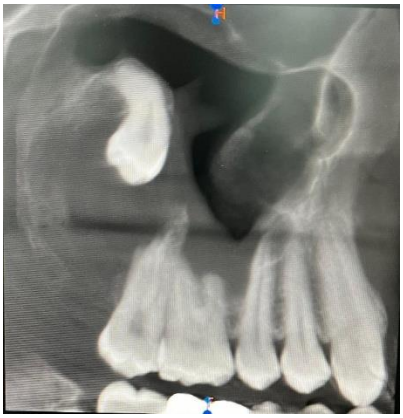


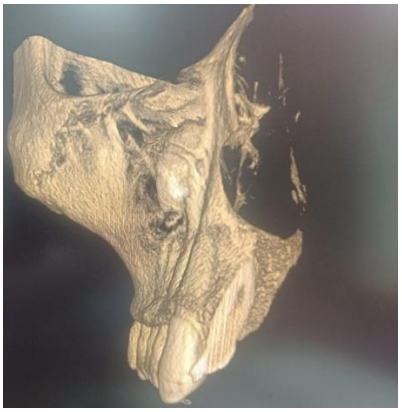
Patient gave no history of trauma, pain, paresis, paresthesia, or lymphadenopathy.

Diagnostic assessment and intervention

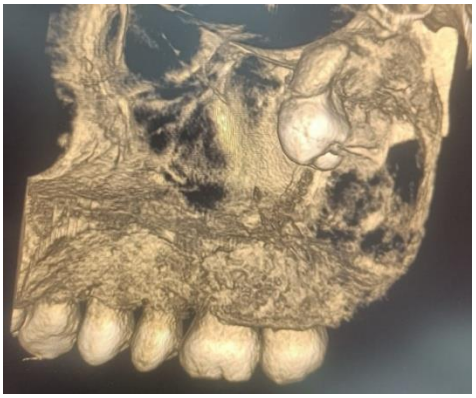
Further radiographic investigation using cone beam computed tomography (CBCT) determined the exact location of the maxillary molar and the lesion extension. A CBCT face revealed ectopic eruption and position of the right maxillary third molar in the maxillary sinus with hyperdense lesion surrounding its crown and obliterating the sinus cavity.

CBCT showed the ectopic third molar with completely formed roots located in the posterosuperior aspect of the right maxillary sinus with a close approximation to pterygoid plates posteriorly .





The third molar was surrounded by a well-defined corticated hyperdense lesion measuring 3cm ×2cm, occupying almost the whole cavity of the right maxillary sinus.The CBCT also revealed the destructive effect of the associated pericoronal lesion on the right maxillary sinus floor and buccal cortical plate, distal to tooth #17 causing oroantral communication, which explains the reason for the purulent discharge, the chief complaint of the patient.



Based on the clinical and radiographical examination, the surgical removal of the ectopic third molar along with cyst enucleation was planned through an intraoral approach under general anaesthesia induced via contralateral nasopharyngeal intubation

A vestibular incision extending from #12 to #16 incision was placed followed by the reflection of the mucoperiosteal flap to expose the anterolateral wall of right the maxillary sinus. It was proceeded by lateral sinus antrostomy, utilizing a standard Caldwell-Luc approach, with a bony window created in the anterolateral wall of the maxillary sinus.

The Schneiderian membrane was incised and reflected to expose the maxillary sinus.

The cystic lining was identified and the complete removal of the cystic lining along with the ectopic maxillary third molar was done.

The antrum was thoroughly irrigated with normal saline and betadine solution 10% and the cystic lining along with the tooth #18 was placed in a 10% buffered formalin solution for subsequent histopathological examination and final diagnosis. The flap was closed with 3-0 vicryl sutures with good approximation of edges. Postoperative IV antibiotics were given to the patient in form of 1.2g of amoxicillin and clavilunic acid twice daily for a minimum of five days with an analgesic (Inj diclofenac 75mg), also one dose of dexamethasone 8 mg was given to prevent postoperative edema of the cheek, and instructions was given to the patient regarding prevention of any activity that increases the sinus pressure like blowing nose etc.

Histopathologic examination of the H&E stained sections shows part of cystic lining made up of stratified squamous non keratinised epithelium surrounded by connective tissue. Focally maxillary sinus lining composed of pseudostratified ciliated columnar epithelium is seen.The connective tissue shows chronic inflammatory cells and cut sections of salivary ducts. Decalcified H&E sections shows cystic lining attached to tooth. The lining is made up of stratified squamous parakeratinised epithelium with surface corrugation and basal tall columnar cells showing reversal of polarity. Focally keratin squames are also evident suggestive of infected odontogenic keratocyst.

On Follow-up a panoramic radiograph was taken after one month of surgery. Comparative analysis of postoperative and preoperative radiographs revealed evidence of osteogenesis, indicative of progressive bone healing. Clinical improvement appeared to outpace radiographic evidence, as osseous regeneration typically manifests more slowly on imaging studies. The patient's young age contributes to a favorable prognosis, with enhanced healing potential and improved recovery prospects.

3. DISCUSSION

Odontogenic epithelium remnants or its components that get stuck in the bone or gingival tissue are the source of DTGs and OKCs. These lesions have the potential to spread to the point where they totally fill the sinus cavity resulting in destruction of the orbital floor, the adjacent teeth, and resorption in the walls of the sinus.

Our patient underwent a thorough enucleation of the cyst and a Caldwell-Luc antrostomy, which is the preferred procedure for maxillary sinus surgery because it offers a direct view of the sinus and permits instrumentation, irrigation, and the removal of big objects[10]. The literature mentions several methods for treating ectopic teeth, including endoscopic assisted treatments[11,12]. in addition to extraoral and transoral methods[13]. Less postoperative and intraoperative morbidity occurs with endoscopic techniques[14]. In order to instrument the supero-lateral portion of the maxillary sinus in a safer manner and to provide direct line access for the visualisation of suspected orbital floor abnormalities, Liau et al. employed the endoscopically aided Caldwell Luc technique. He came to the conclusion that this method enabled precise visualisation of the maxillary sinus's inaccessible regions and the capacity to carry out direct line access surgery when necessary. In this work, we describe a case of an ectopic molar within the maxillary sinus that was linked to an infected odontogenic keratocyst.Both were surgically removed, and the diseased antral tissue was fully excised and evaluated histologically. The patient healed satisfactorily after surgery, and there were no complications[15].

Removing the affected tooth and fully enucleating the lesion intraorally is the preferred surgical therapy if the lesion is infected. Furthermore, it is imperative to remove all diseased antral tissues completely and do a comprehensive histological assessment on all soft tissues that have been resected, appropriately tracking the outcomes for a year[16]. Between 25 and 40 percent of cases have an unerupted tooth[17]. In the posterior ramus molar region, two differential diagnoses that could exist are ameloblastoma and dentigerous cysts. The envelope-like form of OKCs usually has a pericoronal radiolucent appearance, similar to dentigerous cysts[18].

OKC was reclassified as keratocystic odontogenic tumour and classified as a neoplasm. The authors state that the permeative growth pattern, presence of satellite cysts, budding, and high recurrence rate are consistent with a neoplasm and indicate "aggressive" behaviour.

There is ongoing debate on the best course of action for treating odontogenic cysts, and numerous surgical procedures have been proposed. Segmental or marginal excision of the affected jaw, enucleation with curettage, and enucleation with adjuvant therapy, such as cryotherapy or Carnoy's solution, comprise the aggressive approach. Surgical excision or enucleation are the most often used methods of therapy. However, the recurrence rate is significant. A thorough analysis revealed that the overall recurrence rate was about 25%; however, this could be reduced to 8% by enucleation using Carnoy's solution or a modified Carnoy's solution that addressed the remaining epithelia and contained 25% glacial acetic acid and 75% dehydrated ethanol without the use of chloroform. Recurrence after resection is quite rare (<2%). The degree of recurrence may be caused by inadequate removal or "daughter cysts," which may not go away even with therapy.

Because of its inherent biology and the existence of daughter cysts, OKC has the highest propensity to recur among the three types of cysts. Selecting the best surgical technique for these lesions requires careful thought in order to lower the recurrence rates. The surgical procedure has a major influence on the reported recurrence rates of OKC, which are inconsistent. Segmental resection, as predicted, has the lowest recurrence incidence since the surrounding daughter cysts and affected mucosa are removed. The severe morbidity associated with this procedure, which includes oroantral communication loss,

persistent sinusitis, dentition loss, and the necessity for substantial reconstruction, makes it extremely uncommonly performed.

Large cysts have been treated with enucleation, tooth extraction, and first marsupialization to reduce the extent of the osseous defect. The primary drawback of marsupialization is the lesion's persistence or recurrence along with any remaining cystic lining. The management of maxillary cysts by endoscopy is also discussed in the literature. Less surgical and postoperative morbidity is linked to this technique[19].

Radiographically, the lesion appears as a circumscribed unilocular or multilocular radiolucency with smooth or scalloped cortical margins.

The histology of the OKC is extremely distinct, and histological diagnosis is rarely challenging. The uninflamed connective tissue wall's thin, Para keratinized, stratified squamous epithelium displays a characteristically corrugated look. The basal epithelial layer can be easily recognised because to palisaded basal cells with nuclear polarity reversal. There may be desquamated keratin if the cyst lumen is still intact. OKCs are often traumatised; when they become inflamed, the epithelial lining may lose these distinctive features and resemble an inflammatory cyst.

A detailed examination of the whole lining is required to detect the distinctive indications; however, identification may be difficult if inflammation is widespread.

The aetiology of an ectopic eruption can be unclear; however, several theories have been put forward to describe the rise of this condition, such as: developmental disturbances like cleft palate, pathological large cysts which displace tooth buds to other areas, odontogenic and rhinogenic infections or iatrogenic activity[20].

4. CONCLUSION

Ectopic tooth eruptions in the maxillary sinus are rare, but they are more commonly associated with dentigerous cysts than with odontogenic keratocysts (OKCs). Early diagnosis relies heavily on clinical evaluation and radiographic imaging, which are crucial for the timely treatment of odontogenic cyst lesions to prevent morbidity. Imaging modalities such as CT or CBCT scans are invaluable for diagnosing the type of cysts and associated dental abnormalities. The standard approach for managing these cases involves a Caldwell-Luc procedure to surgically extract the ectopic tooth and excise and enucleate the pathological cystic tissue, thereby avoiding complications. Even asymptomatic cases should be managed with this protocol due to the risk of cyst formation or malignancy if left untreated.

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