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Chronic Sinusitis Caused by an Ectopic Maxillary Third Molar: A Rare Case Report

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Abstract | **Case Report**

Impaction of third molars is a common condition in oral and maxillofacial surgery. However, ectopic eruption of maxillary third molars into the maxillary sinus is rare. We report the case of a 58-year-old patient who presented with chronic left maxillary sinusitis. Radiological evaluation, including computed tomography, revealed an ectopic left maxillary third molar located in the posterior wall of the left maxillary sinus, in close proximity to the pterygopalatine fossa, associated with a pericoronal cyst. Surgical extraction was performed through an intraoral approach under general anesthesia. The postoperative course was uneventful, with resolution of sinus symptoms. Management of ectopic maxillary third molars requires careful assessment of their anatomical location and relationship to adjacent structures. The choice of surgical approach depends on the position of the tooth and the surgeon's experience. In asymptomatic cases, conservative management with regular clinical and radiological follow-up may be considered.

Keywords: Ectopic Tooth, Maxillary Third Molar, Maxillary Sinus, Chronic Sinusitis, Dentigerous Cyst, Odontogenic Sinusitis, Case Report.

INTRODUCTION

Tooth development is a dynamic process that involves not only odontogenesis but also tooth eruption. This complex phenomenon allows teeth to migrate from their developmental site to their functional position within the dental arch. Dental eruption may present chronological or topographical abnormalities.

An ectopic tooth is a tooth that develops and erupts in an abnormal, misplaced position outside its normal location in the mouth, oftendue to genetic factors, overcrowding, or developmental issues. While frequently found within the jaw, they can appear in the nasal cavity, sinus, or palate, causing pain, swelling, and infections [1].

The maxillary sinus (or antrum of Highmore) is the largest of the paranasal sinuses, appearing as a paired, pyramid-shaped, air-filled cavity located within the body of the maxilla (cheekbone) on both sides of the nose. It is lined with ciliated, mucus-producing respiratory epithelium (the Schneiderian membrane) and plays a role in humidifying inhaled air, reducing skull weight, and providing voice resonance.

An ectopic maxillary tooth may remain asymptomatic or may cause various clinical manifestations, including chronic sinusitis. The standard treatment consists of surgical removal of the ectopic tooth along with enucleation of the associated cyst.

CASE PRESENTATION

A 58-year-old male patient presented with recurrent left-sided rhinorrhea associated with cacosmia persisting for several months despite multiple courses of antibiotic therapy.

Extraoral examination revealed no abnormalities. Intraoral examination demonstrated a left vestibular swelling opposite teeth 13, 14, and 15. The swelling was non-tender on palpation, fluctuating in consistency, and covered by healthy mucosa. Locoregional examination was unremarkable, with no

cutaneous hypoesthesia or lymphadenopathy. No dental mobility was observed.

Cone-beam computed tomography (CBCT) of the maxillary and paranasal sinuses revealed a foreign body lodged in the posterior wall of the left maxillary sinus, in close contact with the pterygopalatine fossa, associated with lysis of the posterior sinus wall. The lesion exhibited morphological features consistent with a maxillary third molar.

Additionally, complete opacification of the left maxillary sinus was observed, confirming the diagnosis of chronic sinusitis. The condition was attributed to the ectopic tooth and an associated cyst occupying nearly the entire left maxillary sinus, along with an oro-cystic communication (Figures 1 and 2).

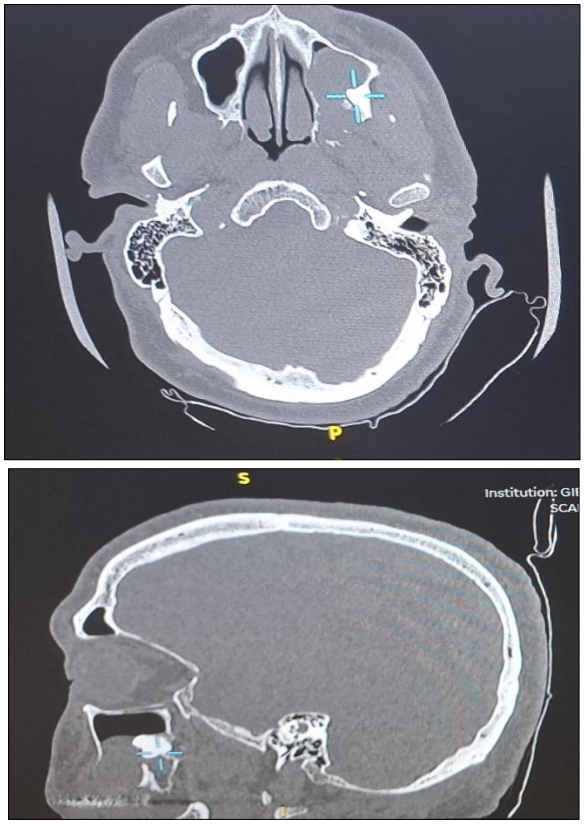

Figure 1: Non-contrast computed tomography (CT) scan of the facial skeleton in the axial plane demonstrated an intra-sinus lesion of bony density located at the posterior wall of the left maxillary sinus

Figure 2: Coronal non-contrast computed tomography (CT) scan of the facial skeleton demonstrated complete opacification of the left maxillary sinus. A well-defined, round hyperdense lesion was identified, surrounded by a hypodense area

Figure 3: Surgical removal of the ectopic third molar under general anesthesia was decided due to its close proximity to the pterygopalatine fossa and the extensive involvement of the maxillary sinus (Figure 3)

An incision was made along the alveolar crest, taking into account the reduced alveolar height. A mucoperiosteal flap was elevated, followed by exposure and removal of the anterior wall of the maxillary sinus. The ectopic third molar was then carefully extracted from the lysed posterior wall of the maxillary sinus along with the associated periradicular cystic lesion.

The sinus cavity was thoroughly inspected to exclude the presence of any additional foreign bodies. The inflamed sinus mucosa was removed and sent for histopathological examination, which confirmed an inflammatory cyst.

The flap was repositioned and sutured using 4-0 resorbable Vicryl sutures.

DISCUSSION

The maxillary third molar, or upper wisdom tooth, is the most distal tooth in the upper arch, typically erupting between ages 17 and 21 [9, 2]. It is characterized by high variability in shape, often featuring a small, heart-shaped crown with three roots that are frequently fused together. Due to limited space, these teeth are frequently impacted or removed [9, 3].

A dentigerous cyst is a common, benign, fluid-filled developmental sac that forms around the crown of an unerupted or impacted tooth, most often the mandibular third molars (wisdom teeth). Typically asymptomatic, these cysts are usually discovered on dental X-rays as a well-defined, radiolucent area. Treatment, which is generally necessary to prevent further jawbone destruction, involves surgical removal (enucleation) of the cyst and the associated tooth.

Odontogenic sinusitis is a, usually unilateral, inflammation of the maxillary sinus caused by dental infection or procedures (e.g., abscesses, root canals, extractions) that disrupt the Schneiderian membrane, accounting for 10-12% of chronic sinusitis cases.

Symptoms typically include foul-smelling nasal discharge, facial pain, and nasal obstruction. It is treated by addressing the underlying dental issue, often combined with antibiotics and sometimes endoscopic sinus surgery [7-4].

Chronic sinusitis treatment focuses on reducing inflammation and clearing blockage with nasal steroids, saline rinses, and sometimes longer antibiotic courses, alongside managing underlying allergies with antihistamines or allergy shots, while avoiding irritants like smoke and dust, and using home remedies like warm compresses and hydration for relief.

Conventional radiography and computed tomography (CT), particularly cone-beam CT, are essential for confirming the diagnosis. Imaging allows accurate localization of the ectopic tooth, assessment of sinus wall integrity, identification of associated cystic lesions, and evaluation of inflammatory sinus changes [10]. These elements are critical in determining the appropriate surgical strategy.

Several surgical approaches have been described depending mainly on the position of the ectopic tooth within the sinus cavity [5].

The Caldwell–Luc procedure remains one of the most commonly performed techniques [8]. It involves creating a bony window in the anterior wall of the maxillary sinus through a crestal or vestibular incision. The tooth is then removed under direct visualization with copious saline irrigation.

The main advantage of this technique is its relatively low morbidity and direct surgical access. However, potential complications include oroantral fistula formation, postoperative maxillary mucocele, devitalization of adjacent maxillary teeth, infraorbital nerve paresthesia, and altered sinus ventilation. Moreover, this approach provides limited visualization

of the posterior and superior sinus walls and carries a risk of displacement of the tooth into the infratemporal fossa.

In the present case, surgical management under general anesthesia was justified by the posterior location of the tooth, the lysis of the posterior sinus wall, its proximity to the pterygopalatine fossa, and the extensive cystic involvement of the maxillary sinus.

CONCLUSION

Impaction-related complications of mandibular third molars are common, whereas ectopic maxillary third molars within the maxillary sinus are rare. Chronic unilateral sinusitis should prompt systematic investigation of a possible odontogenic origin.

Accurate radiological assessment is essential to establish the diagnosis and guide therapeutic planning. The choice of anesthesia, imaging modalities, and surgical approach must be carefully tailored to the anatomical location of the tooth and the extent of sinus involvement.

Early diagnosis and appropriate surgical management ensure favorable outcomes and prevent potentially serious complications.

Summary Points

- Ectopic maxillary third molars in the sinus are rare but may cause chronic sinusitis.
- Cone-beam CT is essential for precise localization and surgical planning.
- Surgical removal with cyst enucleation prevents recurrence and complications.
- Early diagnosis ensures better outcomes and minimizes patient morbidity.

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