

Ectopic Tooth in the Infratemporal Fossa Revealed by Chronic Maxillary Sinusitis: A Case Report and Literature Review

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Abstract

Case Report

Ectopic eruption of teeth outside the dental arch is an uncommon condition. Although ectopic teeth have been reported in the maxillary sinus, nasal cavity, and mandibular condyle, their occurrence within the infratemporal fossa remains exceptionally rare. We report the case of a 39-year-old woman who presented with recurrent sinusitis. Computed tomography (CT) demonstrated an ectopic tooth located within the left infratemporal fossa, associated with chronic inflammatory changes of the ipsilateral maxillary sinus consistent with chronic sinusitis. Infratemporal ectopic teeth are extremely rare, and their origin may be developmental or iatrogenic. Multidetector CT plays a pivotal role in diagnosis, assessment of complications, and therapeutic planning.

Keywords: Ectopic tooth, infratemporal fossa, chronic sinusitis, third molar, odontogenic sinusitis, computed tomography.

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INTRODUCTION

Eruption of teeth is the process by which teeth migrate from the loci of their formation in the mandible and maxilla to their functional place in the oral cavity [1].

Ectopic teeth can be defined as teeth that develop and/or erupt away from their natural anatomic position and can be found in 1% of the total population [2,3]. The underlying mechanisms remain incompletely understood. Proposed mechanisms include trauma, iatrogenic procedures, infection, crowding, dense bone, and developmental disorder [3].

The most common ectopic sites include the maxillary sinus, nasal cavity, mandibular condyle, coronoid process, and orbit [4]. Localization within the infratemporal fossa is exceptionally uncommon.

We present a rare case of an ectopic tooth located in the left infratemporal fossa, revealed by chronic maxillary sinusitis.

CASE REPORT

A 39-year-old female patient presented with left-sided facial pain involving the upper left jaw and purulent nasal discharge. No history of trauma or

significant disease was reported. However, the patient reported previous extraction of all four wisdom teeth.

Computed tomography (CT) of facial bones demonstrated a hyperdense structure with dental morphology located within the left infratemporal fossa, posterior to the posterolateral wall of the ipsilateral maxillary sinus and anterior to temporalis muscle. The lesion was distant from pterygoid muscles (Figure 1). The ectopic tooth measured 15 × 10 mm and exhibited a morphology suggestive of a maxillary third molar (Figure 2).

Associated findings included mucosal thickening of the ipsilateral maxillary sinus, sclerosis of its walls, and focal osteolysis of the anterior wall, suggestive of chronic odontogenic maxillary sinusitis (Figure 3). No radiological evidence of an associated dentigerous cyst was identified.

Given the patient's history of third-molar extraction, the exact origin of the ectopic tooth remains uncertain. Although a developmental ectopic tooth cannot be completely excluded, iatrogenic displacement during previous extraction should also be considered. The absence of previous imaging studies precluded definitive determination of the origin of the ectopic tooth.

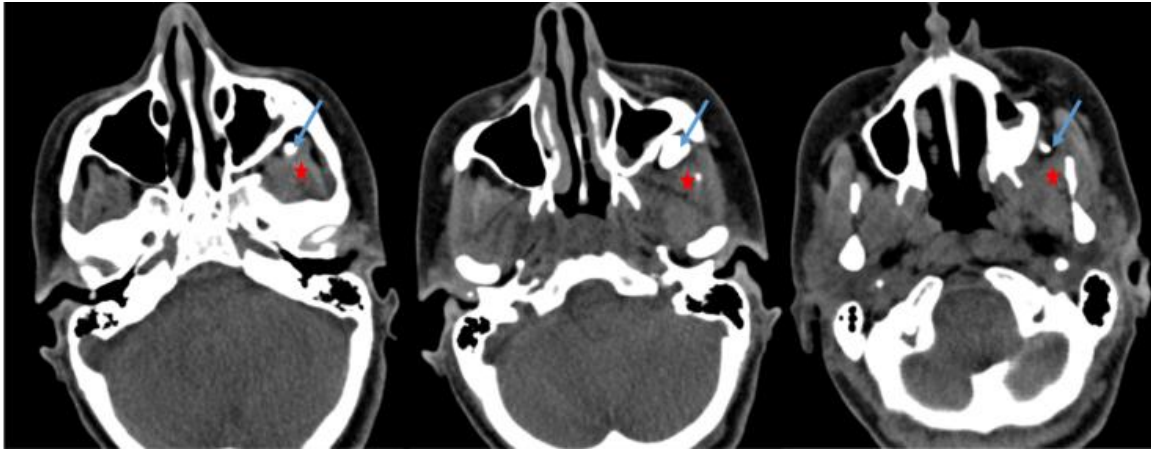


Figure 1: Axial contrast-enhanced CT images demonstrating an ectopic tooth within the left infratemporal fossa (blue arrows), located posterior to the posterolateral wall of the left maxillary sinus and anterior to the temporalis muscle (red asterisks)

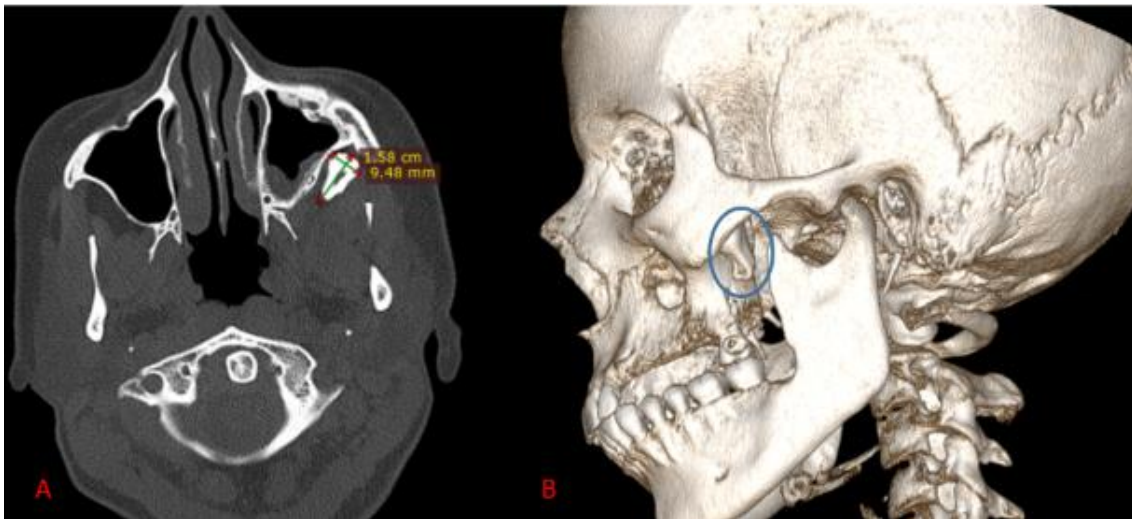


Figure 2: (A) Axial CT image demonstrating the ectopic tooth within the left infratemporal fossa, having morphological features suggestive of a maxillary third molar. (B) Three-dimensional volume-rendered reconstruction confirming the ectopic location of the tooth (blue circle) in the left infratemporal fossa

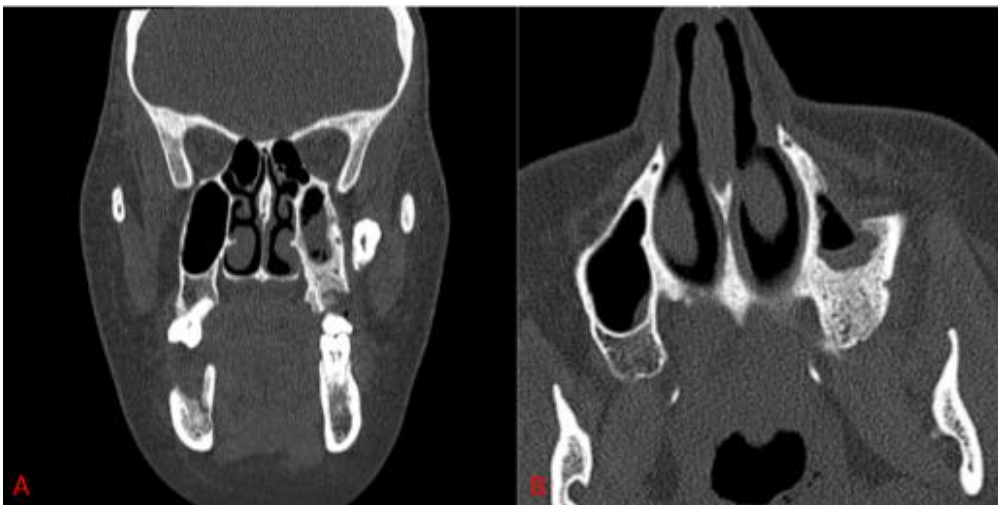


Figure 3: (A) Coronal and (B) Axial bone-window CT reconstruction demonstrating the inflammatory remodeling of the left maxillary sinus, characterized by marked sclerosis of its bony walls and focal osteolysis of its anterior wall

DISCUSSION

Odontogenesis results from a complex multi-stage interaction between the oral epithelium and the mesenchymal tissue under the epithelium. Abnormal tissue interactions during this process can lead to ectopic localization of the tooth [5].

Ectopic teeth outside the oral cavity are rarely reported in the literature, such as in the palate, mandibular condyle, coronoid process, orbit, and nasal cavity [5,6]. It can be asymptomatic or can present with facial pain, nasal obstruction, headache and trismus.

The causes of developing an ectopic tooth are not exactly known. Several mechanisms have been proposed, such as developmental disturbances, odontogenic infections, trauma, pressure exerted by dentigerous cysts, and iatrogenic displacement following dental procedures.

The infratemporal fossa is a pyramidal-shaped anatomical space bounded by the maxilla, the sphenoid bone, and the ramus of the mandible. It contains critical neurovascular structures such as the third branch of the mandibular nerve, the otic ganglion, the chorda tympani and the maxillary artery with its branches. It also contains the pterygoid muscles and the inferior part of the temporalis muscle [7,8].

Localization of a tooth within this region is extremely uncommon. Daimi reported the incidental finding of bilateral ectopic maxillary third molars on the infratemporal surface of a dry human skull, supporting the hypothesis of developmental abnormalities during odontogenesis [9]. However, pathological and iatrogenic mechanisms have also been implicated in ectopic tooth displacement. Kumar *et al.*, described a rare case of an impacted maxillary third molar associated with a dentigerous cyst, located partly within the maxillary sinus and partly within the infratemporal fossa through the posterolateral wall of the maxillary sinus [10]. Dentigerous cysts are thought to arise from the accumulation of fluid between the crown of an unerupted tooth and the surrounding reduced enamel epithelium, which may progressively displace the tooth toward ectopic locations [10]. In the present case, however, no radiological evidence of an associated dentigerous cyst was identified.

Conversely, most reported cases involving the infratemporal fossa correspond to accidental displacement of maxillary third molars during extraction procedures. Battisti *et al.*, emphasized that this uncommon complication usually results from inappropriate extraction maneuvers and fractures extending through the maxillary tuberosity and the posterior wall of the maxillary sinus [7]. Similarly, Tilaveridis *et al.*, reported that improper use of elevators is among the main mechanisms responsible for

displacement of maxillary molars into the infratemporal fossa [11].

In our patient, the history of previous extraction of all four wisdom teeth raises the possibility of an iatrogenic displacement. Nevertheless, the absence of previous imaging studies and operative reports precluded definitive determination of the origin of the ectopic tooth. Therefore, both developmental ectopia and delayed recognition of an iatrogenic displacement remain plausible explanations.

The diagnosis of an ectopic tooth can be readily established radiologically. Computed tomography, particularly cone-beam CT because of its lower radiation exposure, provides excellent characterization of the lesion, allowing accurate assessment of its exact position and its relationship with adjacent anatomical structures [5]. It also plays an essential role in preoperative planning [7].

CONCLUSION

Ectopic teeth located within the infratemporal fossa are extremely rare. Their association with chronic sinusitis emphasizes the importance of considering dental etiologies in unilateral sinonasal disease. In our patient, the history of previous extraction of all four wisdom teeth raises two possible explanations: developmental ectopia or delayed recognition of an iatrogenic displacement. Multidetector CT plays a crucial role in establishing the diagnosis by accurately localizing the ectopic tooth relative to adjacent neurovascular and muscular structures, and guiding safe surgical planning.

Declarations

Conflict of interest: None.

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