

Sinonasal Teeth

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Abstract Ectopic eruption of the teeth in the sinonasal tract and the migration of a displaced dental fragment from the maxillary sinus to the nose are two rare phenomena. This paper reports three cases: an asymptomatic ectopic tooth within the nasal septum, an ectopic maxillary sinus tooth causing repeated attacks of sinusitis, and a dental root that reached the nose through the maxillary antrum associated with *Aspergillus* sinusitis. The etiology, diagnosis, complications, and treatment of sinonasal teeth are discussed.

Nasal teeth are rare. In 1979, Smith et al.¹ found only 27 well-documented cases. A few cases have been reported after this survey by other authors.²⁻⁷

This report describes a case of septal tooth and a case of maxillary sinus tooth; both are thought to be the result of ectopic eruption. Meanwhile, a third case is described in which the dental material reached the nose via the maxillary sinus following a dental surgery trauma a few years previously.

Case Reports

Case 1

A 40-year-old Pakistani male reported at the outpatient clinic with a complaint of persistent, left nasal obstruction for many years. Examination of the nose revealed marked left deviation of the septum. Intraoral examination showed normal dentition, but there was an additional d-formed tooth palatal to the upper central incisors (mesiodens).

A septoplasty operation was performed. During mobilization of the quadrilateral cartilage, a deformed conical tooth was found very firmly attached to the surrounding bone just posterior to the anterior nasal spine. The tooth looked like the mesiodens present in the maxillary arch. It was not removed because its presence did not interfere with the correction of the deviated septum, and it was decided the patient's consent should be obtained first.

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Computerized tomography (CT) done postoperatively is shown in Figure 1. The patient declined to have removal of either the mesiodens or of the septal tooth. He was followed up for 3 years without any symptoms related to his supernumerary teeth.

Case 2

A 32-year-old Saudi male was seen with a complaint of repeated attacks of right purulent, yellowish, thick discharge accompanied by pain in the right maxillary region with mild fever. The attacks had started more than 12 years before, becoming more frequent (every 6 to 8 weeks) over the last 2 years. The attacks were diagnosed as acute sinusitis, which usually subsided after antibiotic therapy. The last attack had subsided 3 weeks previously. Examination showed no significant abnormalities in the nose or throat, and the patient's dentition was normal. Radiography showed a tooth-like structure (Fig. 2) in the floor of the right maxillary sinus. Because of the absence of any history of trauma or dental surgery, the possibility of an ectopic tooth was proposed. Maxillary sinus endoscopy failed to identify the object. A Caldwell-Luc operation was performed to remove a tooth that was obscured by surrounding mucosal thickening. Histologic examination confirmed its dental nature. The patient had no more attacks for a 2-year follow-up period.

Case 3

A 38-year-old white American female patient was seen complaining of persistent, thick greenish discharge from the left nostril for 2 years. She had received many courses of antibiotics without relief. Examination of the nose showed greenish discharge in the left nasal cavity with thick, friable polyp-like swelling in the middle meatus. The patient was edentulous, having had a dental clearance 8 years previously. A CT scan (Fig. 3) showed opac-

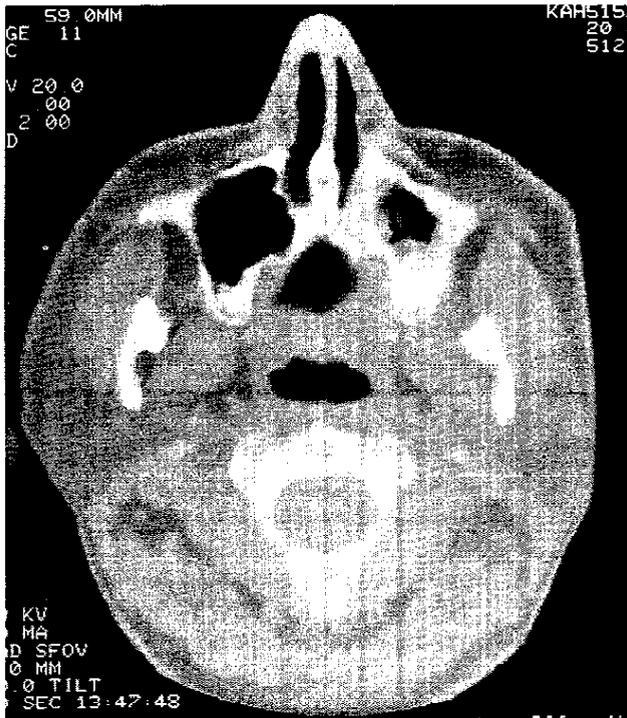


Figure 1 A CT scan showing a tooth in the nasal septum.

ities of the left antrum and the nasal cavity, with a high-density shadow within the nasal opacity.

A left Caldwell-Luc operation was performed to remove thick mucosa and black greasy material that was filling the sinus lumen and extending into the nose through a defect in the antranasal wall. A dental fragment was found within the black debris. Histologic examination showed *Aspergillus fungus* and chronic inflammatory changes. A diagnosis of aspergilloma, possibly secondary to a dental foreign body, was made. No further treatment was needed, and the patient remained clinically and radiologically free until she left the country 2 months later.

Discussion

The presence of a tooth in the sinonasal tract is either due to ectopic eruption (case 1 and 2) or the result of its displacement from its normal site (case 3).

The ectopic eruption of the teeth is a known phenomenon that can occur in a variety of sites: facial skin, orbit, nasal cavity and maxillary sinus, palate, mandibular condyle, and coronoid process.⁷ The etiology of this phenomenon is not clear, but it has been attributed to trauma to the oral cavity region, incomplete union of embryonic processes as in cleft palate,⁸ osteomyelitis of the maxilla,⁹ or because of space restriction due to crowding of dentition, persistent deciduous teeth, or exceptionally dense bone.⁷

The ectopically erupted tooth may be deciduous, permanent, or supernumerary. The supernumerary teeth represent one of the common dental abnormalities. They occur in 0.1 to 1% of the general population.⁷ Their embryogenesis is not clear, but several theories have been postulated. Most authors feel that they develop from a third tooth bud arising from the dental lamina near the permanent tooth bud, or possibly from splitting of the permanent bud itself.⁷ Also, it was suggested that some ectopic teeth may form from aberrant, extraodontogenic epithelium.⁸ These supernumerary teeth are characterized by their poorly formed shapes (in contrast to supplementary teeth that have the morphologic features of normally occurring members of the dentition). They most commonly erupt in the maxillary dental arch where they are called mesiodens if found in the incisor region. Their eruption in the sinonasal tract is uncommon. Smith et al.,¹ in a review of the world literature, identified 17 supernumerary teeth (in addition to two deciduous and 15 permanent) from a total of 27 well-documented, intranasal teeth cases. Some authors suggested that nasal teeth represent inverted mesiodens that have grown toward the nose.⁴ Case 1 supports this hypothesis. In addition to the nasal septal tooth, the patient had a mesiodens in the palatal side of the upper incisors. The presence of the tooth within the nasal septum is a unique feature, since most of the previously reported nasal teeth were found in the nasal floor. Case 2 is believed to be an ectopic eruption of a supernumerary



Figure 2 A lateral plain film showing a toothlike structure in the floor of the maxillary sinus.

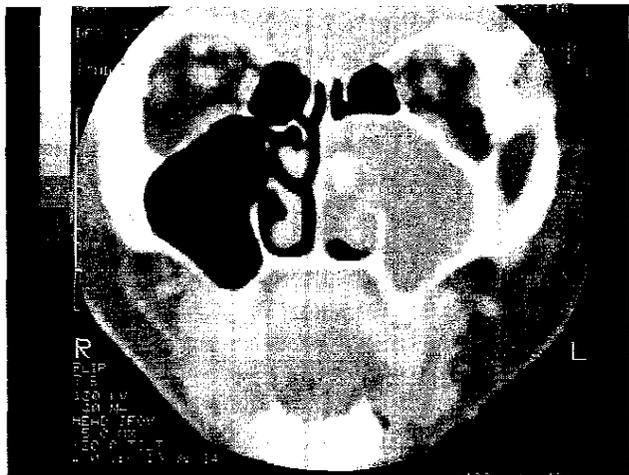


Figure 3 A coronal CT showing heterogenous opacities of the left maxillary and nasal cavities, with the shadow of the dental root in the nose.

ary tooth in the maxillary sinus. Such incidence is rare but has been reported before.:

Case 3 presents a dental fragment that was dislodged into the maxillary sinus and then migrated into the nasal cavity. The inadvertent displacement of all or part of a tooth into the antrum is a comparatively common mishap and usually occurs in association with oroantral fistulae following traumatic extraction. In an analysis of 362 oroantral fistulae, 113 (31.2%) were complicated by the presence of a tooth or dental fragment in the antrum.¹⁰ A small root fragment may be extruded into the mouth via the oroantral fistula, and the patient often gives a history of the root appearing in the mouth following an episode of noseblowing. However, most of the displaced teeth or their fragments remain in the sinus. They may sometimes become immobilized as a result of incarceration by inflammatory tissue or, alternatively, they may lie free in the lumen and rarely pass to the nasal cavity thereafter. The first reference to a displaced root fragment arriving spontaneously in the nasal passage from the maxillary sinus was made by Parker and Dunn in 1955.¹¹ Killey and Kay¹² reported seven patients in whom a tooth had been dislodged into the antral space but later extruded through the nose; in each instance the original oroantral defect had healed spontaneously. In discussing these cases, the authors concluded that the diameter of the maxillary ostium (2.5 to 7.5 mm) and of the accessory ostium (up to 15 mm in diameter) would theoretically allow passage of a dental root to the nose. The foreign body may also reach the nose following destruction of the thin antroanasal wall by pressure necrosis provoked by the displaced root or by an associated pathology (e.g., fungus sinusitis as in case 3).

The intranasal teeth may be asymptomatic (as in case 1). They may also cause a variety of signs and

symptoms including facial pain, feeling of something in the nose, nasal obstruction, epistaxis, rhinorrhea, cacosmia, or external deviation of the nose. The clinical and radiologic recognition of sinonasal teeth is not usually a difficult diagnostic problem. However, it should be differentiated from exostoses, rhinolith, antrolith, foreign body, turnouts, bony sequestra, dense unaerated zygomatic buttress, superimposed conical coronoid process, exuberant root filling, and unerupted teeth. Complications of sinonasal teeth include: chronic bacterial sinusitis (as in case 2), aspergillosis (as in case 3), rhinitis caseosa,¹³ and naso-oral fistula.¹⁴ Patients with sinus perforation and displacement of the tooth or roots into the maxillary sinus have a significantly higher risk of sinusitis than do those with a single sinus perforation occurring during tooth extractions. Von Wowern¹⁵ reported an incidence of 24% of sinusitis for patients who had teeth pushed into the sinus compared to 9% of those with simple sinus perforation.

Sinonasal teeth should be removed or at least followed radiologically. If the patient is seen immediately following the trauma, the displaced teeth or roots should be removed immediately. On the other hand, if a fragment of root has been lodged for a considerable time beneath or embedded in the antral mucosa, and the patient is asymptomatic and the sinus is radiologically clear, immediate surgical interference is probably unnecessary. Killey and Kay¹² reviewed 50 patients with a tooth or root in the maxillary sinus, and in 16% of these cases, the mucosal lining of the sinus appeared normal. On the other hand, the tooth fragment should be removed if the sinus is infected, as in the majority of conditions, or if it is lying free: a condition that carries the risk of fragment extrusion into the nose and, consequently, the disaster of inhalation.

In conclusion, sinonasal teeth may be due to either ectopic eruption or traumatic displacement. They may be asymptomatic or cause a variety of symptoms or complications. Their clinical and radiologic diagnosis is not usually difficult, and they should be removed in most instances.

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