

## ECTOPIC MOLAR TOOTH IN THE MAXILLARY SINUS: A CASE REPORT

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### **ABSTRACT**

Ectopic tooth eruption in a non-dental area is a rare entity, whereas in oral cavity it is most common. The ectopic development of teeth in non-dental localizations have been reported in the nasal cavity, chin, maxillary sinus, mandibular bone, palate and orbital cavity. Ectopic tooth eruptions in maxillary sinus are usually asymptomatic and found incidentally during routine clinical or radiological investigation. Facial pain, epistaxis, purulent rhinorrhoea, headache, swelling and epiphora related nasolacrimal duct obstruction can also be seen. Ectopic teeth within the maxillary sinus are often removed via a Caldwell-Luc procedure. To our knowledge, thirty cases of ectopic tooth in the maxillary sinus had been reported in the last thirty years. In this article, an ectopic maxillary third molar tooth on the right maxillary sinus floor is presented.

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### INTRODUCTION

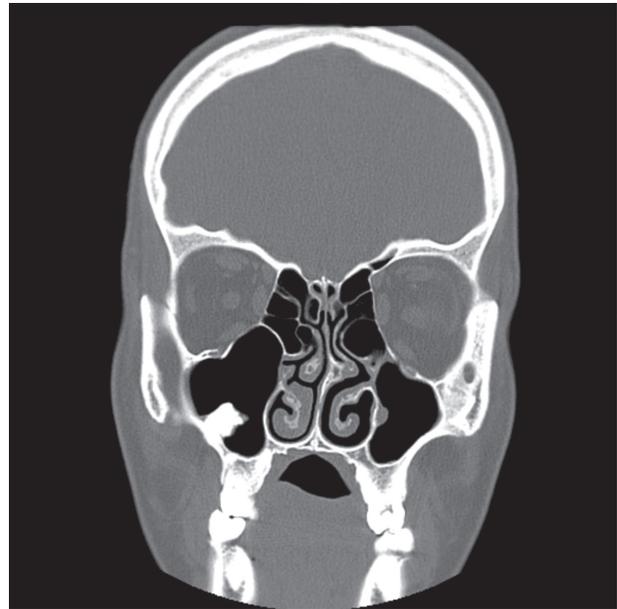
Ectopic tooth eruption in a non-dental area is a rare entity, whereas in dental localization it is most common. The ectopic development of teeth in non-dental localizations have been reported in the nasal cavity, chin, maxillary sinus, mandibular bone, palate and orbital cavity.<sup>1-3</sup> The pathogenesis of ectopic teeth are unknown. Authors believe that aetiology includes developmental disturbances such as cleft palate, trauma, rinogenic or odontogenic infection, genetic factors, crowding or dentigerous cysts surrounding impacted tooth.<sup>4,5</sup> Ectopic teeth may be permanent, deciduous or supernumerary. The maxillary canine and mandibular third molar are involved most frequently.<sup>6,7</sup> Most cases are asymptomatic and usually found incidentally during routine clinical or radiological investigation. Facial pain, epistaxis, purulent rhinorrhoea, external nasal deformity, headache, swelling and epiphora related nasolacrimal duct obstruction can be seen.<sup>8, 9</sup> The standard treatment for an ectopic tooth is extraction of the tooth.<sup>10</sup> Ectopic teeth within the maxillary sinus are often easily removed via a Caldwell-Luc procedure.<sup>11</sup> In the ectopic teeth surrounding by a large cyst, an initial marsupialization to diminish the size of the osseous defect, followed by extraction of the tooth, has been advocated.<sup>10,11</sup>

In this paper, a case of an ectopic tooth in the maxillary sinus is reported, and accordingly a review of the English-language literature of the last thirty years is presented.

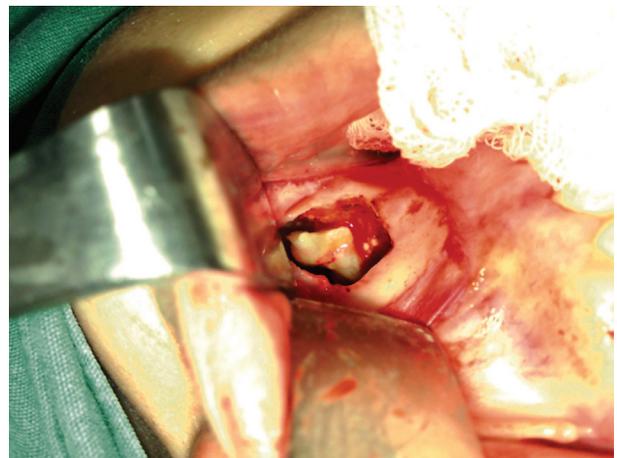
### CASE REPORT

A 24-year-old woman was referred to us due to the pain on the right side of her face lasting for 1 year. Antibiotics and pain-killers were prescribed to her by the general practitioner, but her complaints were not resolved. She had no other symptoms. Anterior rhinoscopy revealed a septal deviation towards left side. On examination of the oral cavity, all the permanent teeth were present except the right maxillary third molar. No other pathological findings were detected as a result of intraoral and nasal endoscopic examinations. Coronal computed tomography (CT) of the paranasal sinuses revealed the presence of an ectopic molar tooth within right maxillary sinus floor, and septal nasal spur at left nasal cavity (Figure 1).

Caldwell-Luc operation on the right side and septoplasty were performed under general anesthesia. Right naso-maxillary window was opened (Figure 2). Tooth was removed from maxillary sinus floor by burr (Figure 3).



**Figure 1.** Coronal image of paranasal sinuses show the area of high attenuation on the floor of the right maxillary sinus.



**Figure 2.** Intraoperative photograph of the tooth in the maxillary sinus.

The patient's symptoms were resolved completely after surgery and remained symptom-free for over a post-operative follow-up period of 1 year.

### DISCUSSION

Tooth evolution results from an interaction between the oral epithelium and the underlying mesenchymal tissue. This development begins in the sixth week in utero at the time of maxillary and mandibular dental lamina formation. This ectodermal structure changes to mature form including a crown and a root.<sup>12</sup> Abnormal tissue interactions during



**Figure 3.** View of the excised tooth.

development may result in ectopic tooth development and eruption. Commonly ectopic eruption of a tooth occurs in the oral cavity and essentially in normal position but rare localizations like nasal septum, mandibular condyle, coronoid process, palate and maxillary sinus has been reported.<sup>13</sup> The maxillary canine and mandibular third molar are involved most frequently. In this paper, a case of a maxillary third molar tooth, which was ectopically located in the maxillary sinus was reported.

The Pubmed and Medline databases in the English-language literature published since 1980 on ectopic teeth located in the maxillary sinus were reviewed. To our knowledge, only 30 cases has been reported until 2010.<sup>1,3,6,7,9,13-24</sup>

Ectopic teeth, are commonly observed in the second or third decade of life.<sup>3</sup> The age range of the reported 30 cases varies from 4 to 57. The mean age of the previously reported cases was 28.06 years. The incidence is higher in men than in women. Our patient was a 24-year old woman. Ectopic teeth are supposed to be related to embryological pathologies such as clefts, fusion deficiencies or cyst formations.<sup>16</sup> Other pathogenetic factors suggested for ectopic tooth formation etiology are obstruction caused by supernumerous teeth formation, developmental disorders, rhinogenic or odontogenic infections, or misplacements related to trauma or cysts.<sup>22</sup>

In the present review, 18 of the previous cases had a molar tooth, five of which had a canine tooth, three had a supernumerary, and one had a premolar tooth, one had an odontoma, and one had a tooth like structure. Seventeen of the molar teeth were third molar, only one of which was a second molar tooth. The case presented was a third

molar tooth, which is found to be the mostly studied one in literature.

Frequently ectopic teeth are asymptomatic and are usually found during routine clinical or radiologic investigations.<sup>17</sup> If the tooth erupts into the maxillary antrum, it can present itself with local sinonasal symptoms like nasal obstruction, facial fullness, headache, hyposmia and recurrent chronic sinusitis. Other rare symptoms include epistaxis, fever, rhinorrhea, nasolacrimal duct obstruction and a deviation of the nasomaxillary anatomy.<sup>22,23</sup> A large maxillary cyst can exert pressure on the sinus walls causing discomfort, pain and fullness.<sup>24</sup> Scored symptomatology helps us to consider the presence of an ectopic tooth but a radiographic examination is essential for diagnosis. Among the 30 case reports summarized in Table 1. 12 patients complained of swelling, 5 of nasal obstruction, 5 of rhinorrhoea, 4 of headache, 2 of epiphora, and only one patient complained of orbital proptosis. Six patients were asymptomatic and were noticed incidentally on radiologic examination. Our patient was referred to us for a pain of one year duration on the right side of her face.

The diagnosis of this condition can be made radiographically with plain sinus X-rays and CT scans taken in axial and coronal sections. Water's view, panoramic radiography and plain skull radiography are simple and relatively inexpensive methods. Although conventional radiography can be used in detecting the structure of the tooth, CT imaging is gold standard for determining the exact localization.<sup>18</sup> In the case studied, CT was performed for paranasal inspection. In the coronal section, a radiopaque image, which had an equal density with the tooth was seen in the inferior of the maxillary sinus.

Foreign bodies (rhinoliths), infections like syphilis, tuberculosis or fungal infections with calcification, benign lesions such as hemangioma, osteoma, enchondroma, calcified polyp, dermoid cysts or tumors, and malignant lesions such as chondrosarcoma, osteosarcoma must be considered in the differential diagnosis of ectopic teeth. In CT scan, a density equal to that of the tooth and a central cavity in the mass are the findings for the diagnosis of ectopic tooth or dentigerous cysts.<sup>22</sup>

When a maxillary sinus tooth or cyst causes symptoms, surgery must be considered. The traditional approach is Caldwell-Luc procedure, which allows a direct view into the maxillary sinus. Although this is the classical treatment, transnasal endoscopic approach has less morbidity.<sup>24</sup>

## CLINICAL DENTISTRY AND RESEARCH

Table 1. Literature review of ectopic teeth in the maxillary sinus in previous reports.

Author	Age	Gender	Composition	Symptom	Localization in the maxillary sinus	Treatment
Golden et al, 1981	37	Female	Molar tooth	No symptom	Roof	Caldwell-luc operation
Chuong , 1984	16	Male	Molar tooth	No symptom	Antrum, medial wall	Caldwell-luc operation
Freedland and Henneman, 1987	21	Female	Supernumerary tooth	Intermittent headache	Antrum, medial wall	Enucleation
Shenoy, 1988	28	Male	Canine tooth	Swelling, nasal obstruction	Antrum,medial ,wall	Caldwell-luc operation
Elango et al, 1991	23	Male	Molar tooth	Asymptomatic	Roof	Follow-up recommended
Jude et al, 1995	42	Male	Molar tooth	Facial asymmetry	Antrum, medial wall	Endoscopic Sinus Surgery
Vele et al, 1996	17	Male	Supernumerary tooth	Swelling	Antrum, medial wall	Caldwell-luc operation
Altas et al, 1997	41	Male	Canine tooth	Swelling,nasal obstruction, epiphora	Antrum, medial wall	Caldwell-luc operation
Bodner et al, 1997	51	Female	Molar tooth	Asymptomatic	Antrum, medial wall	Crestal incision
Bodner et al, 1997	25	Male	Molar tooth	Discomfort in the maxillary region	Antrum, medial wall	Caldwell-luc operation
Bodner et al, 1997	40	Female	Molar tooth	Disappeared iatrogenically during extraction	Antrum, medial wall	Caldwell-luc operation
Takagi and Koyama, 1998	6	Female	Premolar tooth	Swelling	Antrum, medial wall	Marsupialization
Erkmen et al, 1998	11	Male	Supernumerary tooth	Facial pain, purulent rhinorrhea	Floor	Follow-up recommended
Hasbini et al, 2001	21	Male	Molar tooth	Nasal obstruction, headache, hyposmia	Antrum, medial wall	Endoscopic Sinus Surgery
Goh ,2001	17	Male	Molar tooth	Facial pain, purulent nasal discharge	Antrum, medial wall	Caldwell-luc operation
Kamei et al,2001	38	Female	Molar tooth	Facial pain, nasal obstruction, rhinorrhea	Not attached to the wall	Caldwell-luc operation
Bajaj et al, 2003	21	Male	Tooth-like structure	Swelling, epiphora	Roof	Marsupialization, dacryocystorhinostomy
Ustuner et al, 2003	6	Male	Bilateral ectopic teeth	Swelling	Superiomedial wall	Unspecified
Sharma et al, 2006	40	Female	Canine tooth	Facial pain, purulent nasal discharge	Antrum, medial wall	Caldwell-luc operation
Di Pasquale and SHERMATARO, 2006	14	Female	Molar tooth	Asymptomatic	Antrum,medial wall	Endoscopic Sinus Surgery
Srinivasa et al, 2007	45	Male	Molar tooth	Swelling, pain, purulent rhinorrhea	Antrum, medial wall	Caldwell-luc operation

Author	Age	Gender	Composition	Symptom	Localization in the maxillary sinus	Treatment
Altun et al, 2007	30	Male	Molar tooth	Headache	Lateral wall	Caldwell-luc operation
Avitia et al, 2007	49	Male	Molar tooth	Nasal obstruction, orbital proptosis	Posteriosuperior wall	Endoscopic Sinus Surgery
Micozkadioglu and Erkan, 2007	24	Female	Molar tooth	Swelling, facial pain, headache	Floor	Endoscopic Sinus Surgery
Dagistan et al, 2007	37	Male	Canine tooth	Asymptomatic	Floor	Caldwell-luc operation
Haber, 2008	4	Female	Odontoma	Swelling, facial pain	Floor	Caldwell-luc operation
Litvin et al, 2008	57	Female	Molar tooth	Swelling	Roof	Caldwell-luc operation, marsupialization
Buyukkurt et al, 2010	19	Female	Molar tooth	Swelling	Roof	Caldwell-luc operation
Buyukkurt et al, 2010	32	Male	Canine tooth	Swelling	Roof	Caldwell-luc operation
Buyukkurt et al, 2010	30	Male	Molar tooth	Swelling	Antrum	Caldwell luc operation

Transnasal procedure may be useful for teeth around maxillary antrum. According to Table 1, the most common approach (in 18 cases) is Caldwell-Luc procedure. Five patients were treated with endoscopic sinus surgery, 3 with marsupialization, 2 with crestal incision, and enucleation method was used for only one patient. In the present case, Caldwell-Luc operation was performed to remove the tooth from maxillary sinus. Maxillary sinus was viewed through the bony window, sinus mucosa was normal, no pathologic secretion existed, floor of the sinus was intact and there was not any complication caused by the ectopic tooth. The removed material was a mature tooth so no histopathologic examination was required. The patient remained symptom-free over a postoperative period of one year.

To our knowledge, the localization of the ectopic tooth in the maxillary sinus was not analyzed in the previous literature. As seen in the Table 1, medial wall and the antral area are the most common localization cases among the 30 reported ones. In 6 cases, the teeth were located on the roof of the sinus, 4 of which were on the floor, 1 on the lateral wall, 1 was placed superomedially, 1 was placed posteriosuperiorly and one of them was not attached to the sinus walls. The presented case is the fifth maxillary sinus tooth localized on the sinus floor, reported in the English-

language data base in the last 30 years. The high range of antral localization may be due to increased symptomatology. Asymptomatic ectopic teeth are estimated to have a higher incidence but it is difficult to determine the exact ratio.

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