Accidental migration of a dental implant into the nasal cavity

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Abstract
The accidental migration (i.e., displacement) of dental implants into the maxillary sinus is a relatively common complication in dental clinical practice. Here, we report the extremely rare nasal cavity migration of a dental implant in a 23-year-old man. Considering the superficial location of the dental implant and the absence of oronasal fistula formation, we attempted to remove the implant via endoscopy, nasal bayonet forceps, curved hooks, and suction in an ambulatory surgery setting with the patient under local anesthesia. Importantly, we were able to extract the implant with only minor complications. The patient received medication for 2 weeks and exhibited uneventful healing. Our findings may be useful for physicians and dentists who encounter similar situations in clinical practice.

Keywords
Implant, nasal cavity, endoscope, migration, ambulatory surgical procedures, local anesthesia, suction, endoscopy, forceps, curved hooks

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Introduction
The introduction of endosseous dental implants as an option for partially and fully edentulous patients has revolutionized dental treatment. However, these methods are not free of complications, such as implant migration into the sinus. There have been several reports regarding implant migration into the maxillary sinus and only two reports regarding the migration of a dental implant into the ethmoid sinus to the best of our knowledge, there have been no reports of implant migration into the nasal cavity. This report

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describes an instance of this rare complication, with the aim of providing guidance for clinicians who may encounter similar situations.

Case report
An otherwise healthy 23-year-old man presented to our clinic with a 1-month history of right-sided foul nasal odor. He denied nasal obstruction, epistaxis, purulent nasal drainage, and fever. He reported a history of dental implant treatment in the right maxilla, approximately 9 months prior at a local dental clinic. Nasal endoscopy revealed a right-sided tan, hard foreign body coated with purulent secretions, located between the middle turbinate and nasal septum. Computed tomography examination of the sinuses showed a 1.0 × 0.3-cm, hyperdense, columnar foreign body in the right common nasal meatus (Figure 1a). The patient had no history of foreign body insertion. Because of the superficial location of the foreign body and the absence of an oronasal fistula, extraction was performed with the patient under local anesthesia in an ambulatory surgery setting. Following complete infiltration of the nasal mucosa with local anesthetic solution (1% tetracaine hydrochloride) and oxymetazoline, the foreign body was removed smoothly under endoscopy with a nasal bayonet forceps, curved hooks, and suction; postoperatively, the patient experienced slight nasal bleeding and no other complications. The foreign body was identified as a dental implant encrusted with a thick layer of calcified material. The patient was prescribed antibiotics (cefaclor, 250 mg orally, three times per day; metronidazole, 400 mg orally, three times per day), an anti-inflammatory agent (budesonide nasal spray, 64 μg/day [one spray per nostril of budesonide 32 μg once daily]), nasal irrigation, and a decongestant nasal agent (0.05% oxymetazoline nasal spray, one spray per nostril once every other day) for 2 weeks. At the 1-month follow-up visit, the patient reported complete resolution of symptoms and did not exhibit purulent discharge in the bilateral nasal cavity.

This report was approved by the Ethical Review Committee of Peking University People’s Hospital. Written informed consent was obtained from the patient for publication of the report.

![Figure 1](image_url)

**Figure 1.** Computed tomography findings in a patient with a migrated dental implant. a, Coronal section shows displaced implant in the nasal cavity (filled arrow). Extensive sinus opacification is present (hollow arrows). b, Coronal section shows enlargement of the natural maxillary sinus ostium (circled area).
**Discussion**

Implant migration (i.e., displacement) is one of the most frequent complications of dental implant treatment. Implant migration can be caused by surgical inexperience, insufficient planning, changes in intranasal sinus pressure, autoimmune reactions, peri-implantitis or bone resorption, improper occlusal forces, and/or bone deficiencies. There have been several reports regarding migration of dental implants, most commonly into the maxillary sinus and less commonly to other adjacent craniofacial structures. To the best of our knowledge, there have been no reports regarding the migration of a dental implant into the nasal cavity through the maxillary sinus ostium.

Implant migration into sinuses can cause mucociliary flow impairment and sinus infections; additionally, some patients with implant migration have developed fungal infections and cancer. Most instances of implant migration are detected while the implant is located in the maxillary sinus. However, if the migration is asymptomatic and remains undetected, the implant will cause chronic inflammation, erosion of surrounding structures, and migration into unexpected sites. A possible explanation for this migration involves ciliary movement of the columnar epithelium of the Schneiderian membrane, which serve to drain the maxillary sinus. In our patient, a coronal view of the computed tomography findings demonstrated an enlarged maxillary sinus ostium that may have been eroded by chronic inflammation; the dental implant may have migrated from the maxillary sinus to the nasal cavity due to ciliary movement. Therefore, the dental implant obliterated drainage of the right sinus and caused extensive sinusitis (Figure 1b). Notably, dental implants may also migrate into the nasal septum because of technical misplacement associated with disturbance of osseointegration.

If concomitant developments such as maxillary sinusitis or septal abscess occur, the conventional treatment approach is to perform extraction as soon as possible. There are different methods for resolution of migrated implants, depending on their locations. Recommended methods for extraction of a migrated implant within the sinus include the Caldwell-Luc approach, in which the maxillary sinus is opened from the canine fossa; a method involving the use of a nasal endoscope; and a combination of these two techniques. Sousa Menezes et al. described a patient who developed a septal abscess due to the migration of a dental implant into the nasal septum; it was resolved by endoscopic foreign body excision and septal abscess drainage. In our patient, computed tomography and nasal endoscopy findings suggested that the implant was located superficially and that no oronasal fistula was present; therefore, we attempted to remove the implant in an ambulatory surgery setting with the patient under local anesthesia. Importantly, we were able to extract the implant with only minor complications.

**Conclusions**

Migration of dental implants into the nasal cavity through the maxillary sinus ostium is an extremely rare complication. Here, we successfully resolved a migrated implant with the aid of nasal endoscopy in an ambulatory surgery setting, with the patient under local anesthesia. Postoperative healing was uneventful with complete resolution of local inflammatory signs. Our findings may provide useful guidance for physicians and dentists who encounter similar situations in clinical practice.
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Declaration of conflicting interest
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