

Accidental displacement of a dental implant into the Nasal Cavity: Report of a rare case

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June 29, 2022

Abstract

A healthy 48-years-old male patient was referred to our department to take radiographs of a displaced implant. Upon radiographic evaluation, it was unveiled that the implant has migrated to the nasal cavity and is trapped under the middle concha. The implant was removed under endoscopy through the right nostril.

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Keywords: Dental Implants, Nasal Cavity, Migration, Dental Implantation

In dentistry, oral rehabilitation using dental implants has gained more popularity among patients and dentists because of dispelling some drawbacks and limitations of traditional prostheses. Even though this treatment is generally considered to be safe, implants can also have various problems and complications such as damaging adjacent neurovascular bundles like inferior alveolar and mental, infection, and migration (i.e., displacement) to abutting anatomical spaces.¹ Maxillary, ethmoid, and sphenoid sinuses, cranial fossae, orbital floor, and nasal cavity are reported sites of implant migration.²⁻⁶ There have been many cases of dental implants migrating into the maxillary sinus, while instances of displacement into other craniofacial tissues are sporadic.⁵ Implant migration into the nasal cavity is extremely rare. As far as we know, to this day, only four studies in the literature have reported this unique complication. It has been decades since implants became a frequent routine procedure in everyday dental practice. Regarding this high application rate, only four reported occurrences of this complication indicate the rarity of this condition. Migrated implants could damage vital organs and cause severe or life-threatening injuries. Therefore, it is crucial to identify the exact coordinates of migrated implants to extract them securely and quickly. Because of the complicated anatomy of paranasal sinuses and nasal cavity, conventional radiographic approaches fail to depict the exact situation, and further advanced imaging techniques are required. These imaging modalities necessitate professional interpreting and previous encounter with comparable scenarios in the field.

Here we report a clinical case of migration of an implant into the nasal cavity, which was discovered when taking three-dimensional (3D) radiographs to find it after displacement into the maxillary sinus.

Case report

A healthy 48-years-old non-smoker male patient with no related systemic condition was referred to our department by his oral and maxillofacial surgeon in order to take a cone-beam computed tomography (CBCT) radiograph of an intruded implant into his right maxillary sinus. Six months ago, the patient had undergone open (window) sinus floor elevation surgery at the site of lost teeth 3,4, and 5 in order to rehabilitate the posterior free-end edentulous area. The dentist placed three implant fixtures on the corresponding sites three months later. The implants of teeth 3 and 5 were successfully placed with proper primary stability, but the implant of region 4 (maxillary second premolar) was displaced into the maxillary sinus because of the dentist's miscue and improper insertion. Afterward, the dentist sutured over the region of intruded implant, informed the patient, and referred him to an oral and maxillofacial surgeon to remove the implant from his sinus. Whereas the dentist strongly recommended the patient to visit the oral and maxillofacial surgeon, the patient recoured the oral and maxillofacial surgeon with a delay of three months and was instructed to take a new CBCT image of the displaced implant. Then, the patient was referred to our oral and maxillofacial radiology department to take a CBCT scan to inform the surgeon about the location of the migrated fixture.

No extra-oral or intra-oral signs or symptoms such as fever, discomfort, edema, erythema, or suppuration were observed in the clinical examination. 3D radiographic evaluation, revealed that the implant has migrated to the nasal cavity through the ostium of maxillary sinus and is trapped under the middle nasal concha in the middle meatus (Figs. 1&2). No further opacity or thickening of the sinus lining was observed in the right maxillary sinus (Fig. 3). The patient was informed of his situation and was referred to an otorhinolaryngologist for further interventions.

After complete infiltration of the nasal mucosa with local anesthetic solution, the ENT surgeon removed the migrated implant gently under endoscopy by nasal bayonet forceps and Iterson nasal hook through the right nostril. The patient had some nasal bleeding after surgery but no additional issues. The patient was given an antibiotic therapy of amoxicillin-clavulanate for seven days, as well as analgesics and nasal irrigation. Desired healing was observed at the two-week follow-up session, and the patient had no discomfort.

A writtent consent for publication of radiographic and demographic information of patinet has been obtained.

Discussion

Implant treatment can have several complications such as osseointegration failure (loosening), implant fracture, peri-implantitis, injury to surrounding structures such as nerves and vessels, and aspiration.¹ One of the less common complications is migration into adjacent structures, most commonly into the maxillary sinus.^{1,2} Direct displacement of implant may occur for various reasons during implant insertion. This might be due to the dentist's lack of skill and experience, inappropriate bone quality, excessive implant tapping, untreated perforation of the sinus lining (Schneiderian membrane), or application of too much force.^{4,6-9} Cases of implant migration into maxillary sinus are repeatedly reported, but implant displacement into other anatomical spaces like nasal cavity is scarce.²

We reported a case in which the implant was migrated into the maxillary sinus due to inappropriate insertion and blunder of the dentist. Then it accidentally moved into the nasal cavity because of the patient's procrastination and attending to the specialist three months after his dentist's order.

Up to the present, there are only four reports of implant migration into the nasal cavity in the literature which indicates how infrequent this complication is, considering the large number of implant treatments done in clinical practice (Table 1). Two of these studies have reported that the implant had migrated into the nasal cavity indirectly from the maxillary sinus through the ostium, as in our case.^{3,6} While in the other two reports, implants had moved directly from the oral cavity to the nasal cavity by perforating the nasal floor.^{4,5}

Although implant treatment itself is more prevalent in females, the current literature suggests that the prevalence of this complication is higher in males compared to females. However, this conclusion cannot be considered robust due to the low number of reported cases. It should be noted that the mean age of reported patients of implant migration is approximately one decade lower than the mean age of patients receiving

implant treatment.¹⁰ Among the reported patients who have experienced migration of a dental implant to the nasal cavity, the youngest and oldest are respectively aged 23 and 65.

Extraction of the migrated implant by surgical operation was the treatment of choice in all studies, which had good prognosis in every one of these reports.^{5,6} However, in two studies it has been mentioned that the migrated implant is expelled spontaneously.^{3,4} In the study of Sanchis & Díaz, the implant accidentally was thrown off through the nose.⁴ But, in van de Loo et al.'s study, the implant disappeared after being detected in the CBCT.³ Most probably, the implant entered the gastrointestinal tract subconsciously and was thus excreted.

Implant migration into paranasal sinuses can cause pain, fungus-related infections, and sinusitis.⁶ In all reported cases of implant migration into the nasal cavity, patients have symptoms like nasal discomfort, nasal pain, and purulent discharge;³⁻⁶ on the contrary, the patient presented in this study did not experience any discomfort. The reason for being asymptomatic is uncertain. However, this could be explained by the short duration of the presence of the implant in the nasal cavity, the absence of sinusitis, and the aseptic surgical placement of the implant.

In this case, a possible reason for implant migration from the maxillary sinus into the nasal cavity can be the ciliary motion of the columnar epithelium of maxillary sinus membrane, which is toward the primary ostium, in combination with the patient's head movements over time that made the implant move through ostium into the nasal cavity.

Since implant displacement after implant surgery is not uncommon,⁴ it is essential to use appropriate techniques, properly place the implants in a stable and assured situation, and schedule regular follow sessions. In case of implant migration, 3D imaging modalities such as CBCT are necessary to determine the exact place of implant insertion.⁵ Preoperative 3D imaging should be conducted prior to removing the migrated implant to precisely locate the implant. Due to the possibility of additional migration, the period between imaging and surgery should be kept minimum.

It is also vital to extract the migrated implant as soon as possible since it can move into other structures and cause further complications or cause acute and chronic sinusitis.^{11,12} Intraoral surgical and trans-nasal endoscopic procedures have both been documented for removing implants migrated to nasal and paranasal cavities.¹³⁻¹⁵

Findings of this report could help dentists and surgeons prevent, diagnose, and manage accidental migration of dental implants into the nasal cavity.

Conflict of Interests

None

Acknowledgment

None

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Tables

Table 1. Characteristics of reported cases of dental implant migration to the nasal cavity.

Authors	Year	Gender	Age	Insertion site	Migration site
van de Loo et al. ³	2013	Male	65	Maxillary left incisors and canine area	Indirectly from oral cavity into inferior nasal meatus
Menezes et al. ⁵	2019	Female	37	Maxillary incisive region	Directly from oral cavity into nasal cavity
Li et al. ⁶	2020	Male	23	Right maxilla	Indirectly from oral cavity to common nasal meatus
Sanchis & Díaz al. ⁴	2021	Female	41	Anterior maxilla	Directly from oral cavity into nasal cavity
Safi et al.	2022	Male	48	Right maxillary second premolar	Indirectly from oral cavity to middle nasal meatus



