



# Implants displaced into the maxillary sinus, an endoscopic approach - a report of two cases

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## Abstract

Accidental implant displacement into the maxillary sinuses and accompanying complications are well documented in the literature. Two surgical approaches have been suggested to remove the displaced implants and to handle the related complications: an intraoral approach and the nasal endoscopy. The intraoral approach is preferred in cases of absence of local infection, ostium obstruction, and oroantral communication needing to be closed.

The nasal approach, besides retrieval of displaced implants, allows the treatment of any associated pathology and reestablishment of the mucociliary clearance as well as the natural ventilation through the ostium.

This article reports two clinical cases of implant displacement in the maxillary sinus treated with a nasal endoscopy through the middle meatal meatotomy.

**Keywords:** dental implant, maxillary sinus, displacement, nasal, endoscopy

## Introduction

Implant displacement into the sinus could be asymptomatic and, in some cases, an oroantral communication (OAC) and/or infection of the paranasal sinuses could be observed [1,2].

Implant displacement may occur during the implant surgery associated or not with the sinus augmentation procedure, or during the healing period usually related to the immediate or early loading protocols or bone loss around the implant [3].

Two treatment modalities have been suggested to retrieve the displaced implants and to handle the related complications: an intraoral approach and the endonasal approach [4,5].

The endo-nasal approach, based on functional endoscopic sinus surgery (FESS), provides straight access and visualization of the sinus cavities and could be performed through the middle or lower meatal meatotomy or in some cases a combination of both [6,7].

The aim of this paper is to describe 2 clinical cases of implant displacement in the maxillary sinus treated by endo-nasal approach through the middle meatal meatotomy.

## Clinical cases

Both patients presented here signed an informed consent before procedures.

### Case 1

A healthy, ASA I, 54-year-old male patient suffering from chronic sinusitis was referred to our clinic. Three years before, he received a partial maxillary prosthetic rehabilitation with the placement of five implants in his left posterior maxilla by his dental practitioner. Clinical examination revealed a minor pain in the left posterior maxilla. CBCT detected the presence of an implant with high density encapsulated with granulation tissue and signs of sinusitis (Figure 1). The trans-nasal approach was decided after discussing

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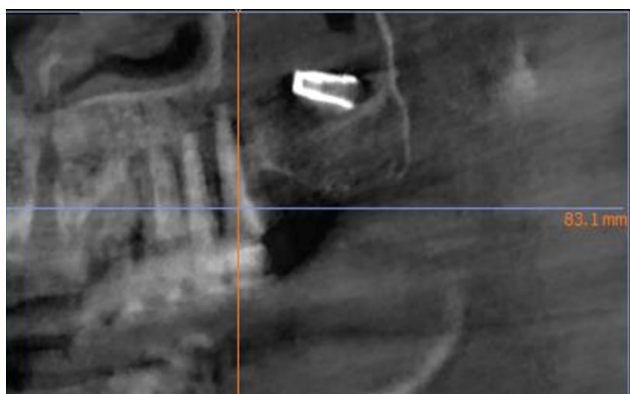
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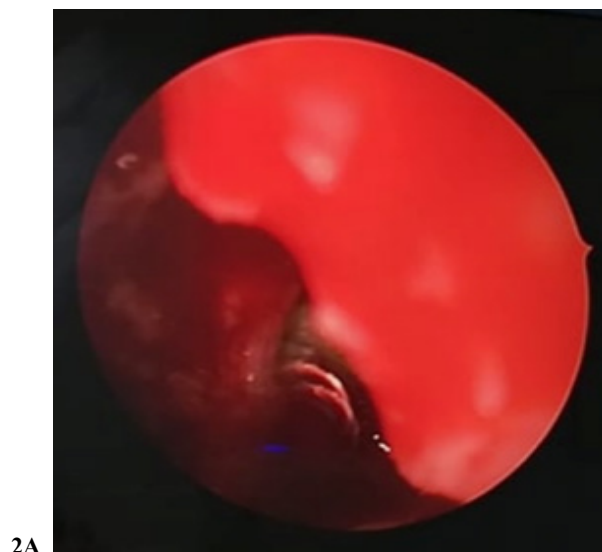
with the patient, as there is no oroantral communication. FESS was achieved under general anesthesia in the supine position. The patient received 2 grams of amoxicillin/clavulanic acid on call to the operating room. The nasal cavity received cotton pads saturated with the mixed solution (30 ml of 0.1% oxymetazoline hydrochloride, 20 ml of 2% lidocaine, and 4 ml of adrenaline 1:1000) and was inserted lateral to the medial turbinate and then placed more anteriorly to reach the vestibule and kept for 5 minutes after a gentle retraction of the middle turbinate medially with a long Cottle nasal knife under vision on a monitor through a 5 mm 30 degrees scope. Local injection of lidocaine 1% with adrenaline (1:100,000) was done on the base of the middle turbinate and uncinate process.



**Figure 1.** A sagittal reconstruction of the CBCT, implant in the sinus surrounded by granulation tissue.

The first step was to identify the middle turbinate, the uncinate process, and the labyrinth between the anterior portion of the middle turbinate and the uncinate and the lacrimal processes. An incision was made at the free edge of the uncinate process by using a sickle knife and dissection of the uncinate with back-biting forceps was done. The free edge of the uncinate process was then removed submucosally allowing the identification of the position of the anatomic ostium. The ostium was entered, and a ball probe seeker was used to widen the area posteriorly. The sinus cavity might then be examined by means of a 30-degree and a 70-degree rigid endoscope. Irrigation and suction inside the maxillary sinus were done. After a thorough examination of the maxillary sinus cavity has shown evidence of an inflammatory mucosa, and the implant was located using a 70-degree angled endoscope and retrieved by means of curved forceps (Figure 2a and 2b). The hemostasis was satisfactory, and the estimated blood loss was 10 ml. The postoperative period was uncomplicated, and the patient was dismissed the same day with paracetamol in case of pain. Nasal

pads were removed 72 hours after surgery and followed for nasal cavity debridement weekly postoperatively and initiated to irrigate the nasal cavity with 100% natural isotonic seawater 3 times per day for 2 months.



2A



2B

**Figure 2.** A: visualization of the implant inside the sinus; B: implant retrieved.

### Case 2

A healthy, ASA II, 64-year-old male patient suffering from chronic sinusitis was referred to our clinic. Two years before he received, by his general practitioner, two tissue level implants in the right posterior maxilla and restored two months later by a cemented fixed bridge, the patient was suffering from sinusitis after the crown cementation. Clinical examination revealed a minor pain in the right posterior maxilla. CBCT revealed the presence of an implant-abutment element very well encapsulated with granulation tissue and signs of sinusitis (Figure 3). After discussing with the patient and as no oroantral communication existed, the trans-nasal approach was decided under general anesthesia. The same surgical procedure was performed as for the previous patient (Figure 4a, 4b and 4c). The recovery was smooth without any complications.

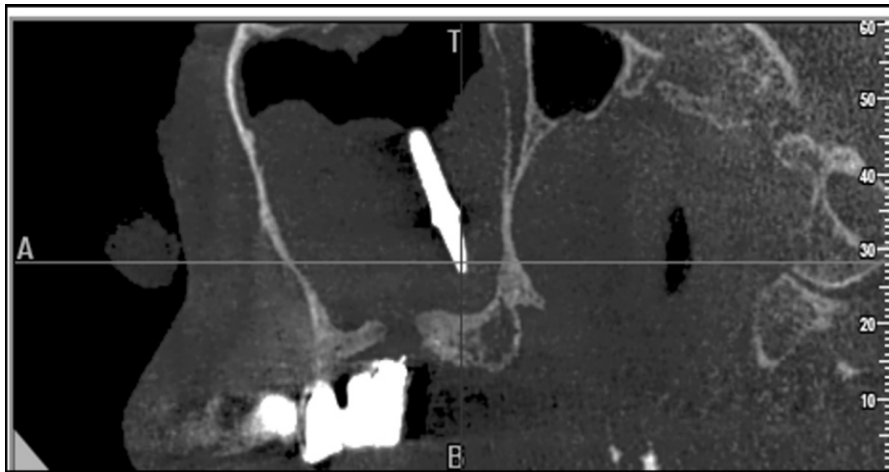


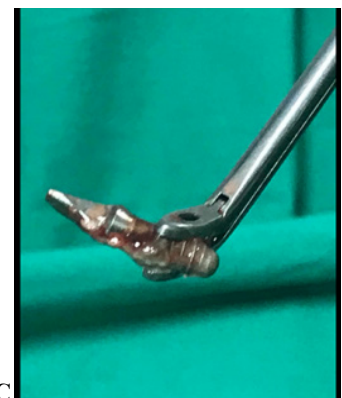
Figure 3. Same as 4a with the invert position of the implant-abutment.



4A



4B



4C

Figure 4. 4A: visualization of the granulation tissue inside the sinus. 4B: implant was located and retrieved by means of curved forceps. 4C: implant-abutment retrieved.

### Discussion

Accidental implant displacement into the sinuses and accompanying complications are well stated in the literature [8,9]. Therefore, the anatomy of the complex maxilla/sinus must be carefully assessed before any surgical procedure [2]. Some authors enumerated some causes that may be favorable for implant displacement during implant surgery, including incorrect treatment planning, surgical inexperience, poor primary stability, unsuccessful maxillary sinus floor elevation, and sinus membrane perforation implant-site drilling [3-5,9].

Implant displacement after crown cementation or months after could be attributed to the inflammatory process around the implants leading to loss of osseointegration, inappropriate loading of the occlusal forces, and alterations of the pressure in the nasal cavities [2,3].

Sgaramella et al. [3] evaluated twenty-four

displaced dental implants into the sinus in twenty-one patients due to either improper treatment plan or even inadequately executed surgical procedure. Manor et al. [4] in their retrospective study of over 55 implants, found that an OAC settled in forty-six patients. In 72% of the cases, implant migration was related to bone resorption and absence of osseointegration and 28% of implants displaced happened following sinus bone augmentation procedures.

This paper reported a first case where the implant was migrated during implant placement and could be related to site drilling and poor quantity and quality of maxillary bone.

In the second case, the implant-abutment migrated into the sinus after crown cementation. This displacement could be related to many reasons, including the loss of osseointegration, and /or implant-abutment forced into the sinus during the cementation or due to the pressure

modifications inside the sinus cavity.

Surgical procedures for the retrieval of migrated implants are divided into two main approaches: trans-oral or/and trans-nasal [5-7,9]. The intraoral approach may be preferred when there is no sign of infection and there is no ostium obstruction associated with implant migration and allows treating simultaneously an OAC [5].

However, this intraoral procedure has been linked with multiple complications such as maxillary sinus mucosal swelling, ostium narrowing, or reduction in the ciliary activities, consequently inhibiting or interrupting mucociliary clearance [4,9]. FESS is recommended in cases of affected sinuses since it allows retrieving the displaced implant and treating maxillary sinus pathology when needed [5-7]. Middle antrostomy was described by Chiapasco et al. [5] and Matti et al. [6], as the most used nasal approach for removal of migrated implants. Safadi et al. [7] retrieved 25 displaced implants from 24 patients via a trans-nasal approach, or in combination with an intraoral approach for 5 patients to close the OAC. Middle antrostomy was used to retrieve 20 implants while inferior antrostomy was used in five cases.

Implant displacement might be avoided by an appropriate analysis of the preoperative x-ray, choosing an appropriate treatment plan, and observing the surgical limitations.

## References

1. Chiapasco M, Zaniboni M, Boisco M. Augmentation procedures for the rehabilitation of deficient edentulous ridges with oral implants. *Clin Oral Implants Res.* 2006;17 Suppl 2:136-159.
2. Gerken U, Esser F, Möhlhenrich S, Bartella A, Hölzle F, Fischer H, et al. Objective computerized assessment of residual ridge resorption in the human maxilla and maxillary sinus pneumatization. *Clin Oral Investig.* 2020;24:3223-3235.
3. Sgaramella N, Tartaro G, D'Amato S, Santagata M, Colella G. Displacement of Dental Implants Into the Maxillary Sinus: A Retrospective Study of Twenty-One Patients. *Clin Implant Dent Relat Res.* 2016;18:62-72.
4. Manor Y, Anavi Y, Gershonovitch R, Lorean A, Mijiritsky E. Complications and Management of Implants Migrated into the Maxillary Sinus. *Int J Periodontics Restorative Dent.* 2018;38:e112–e118.
5. Chiapasco M, Felisati G, Maccari A, Borloni R, Gatti F, Di Leo F. The management of complications following displacement of oral implants in the paranasal sinuses: a multicenter clinical report and proposed treatment protocols. *Int J Oral Maxillofac Surg.* 2009;38:1273-1278.
6. Matti E, Emanuelli E, Pusateri A, Muniz CC, Pagella F. Transnasal endoscopic removal of dental implants from the maxillary sinus. *Int J Oral Maxillofac Implants.* 2013;28:905-910.
7. Safadi A, Ungar OJ, Oz I, Koren I, Abergel A, Kleinman S. Endoscopic sinus surgery for dental implant displacement into the maxillary sinus-a retrospective clinical study. *Int J Oral Maxillofac Surg.* 2020;49:966-972.
8. Dedeoğlu N, Altun O. Evaluation of maxillary sinus anatomical variations and pathologies in elderly, young, posterior dentate and edentulous patient groups with cone-beam computed tomography. *Folia Morphol (Warsz).* 2019;78:595-599.
9. Jeong KI, Kim SG, Oh JS, You JS. Implants Displaced Into the Maxillary Sinus: A Systematic Review. *Implant Dent.* 2016;25:547-551.