

Migration of a Dental Implant to the Maxillary Sinus Prior to Second Stage Surgery: A Case Report

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Abstract

Dental implants are the most preferred treatment option for the rehabilitation of the edentulous patients. However, implant placement to the posterior maxilla can be problematic due to bone atrophy and hyperpneumatization of the maxillary sinus. Bone augmentation procedures such as, internal or external sinus lift can be necessary. Implant placement without bone augmentation procedures can increase the migration risk of the dental implant to the maxillary sinus. The aim of this report is to present the diagnosis and the treatment of migrated dental implant to the maxillary sinus. A 52-year-old male patient was referred by his dentist for the removal of a dental implant migrated to the maxillary sinus. A migrated dental implant was seen on panoramic radiography and CBCT imaging was performed. CBCT images showed that a dental implant staying under the orbital floor and lateral side of the upper nasal concha in maxillary sinus. Endoscopic approach via nasal ostium was failed due to improper position of the dental implant. A Caldwell–Luc operation was performed and migrated implant extracted from the maxillary sinus.

Keywords: Dental implant; Maxillary sinus; Migration; Caldwell-Luc

Introduction

Rehabilitation of the edentulous posterior maxilla with implant-supported prosthesis has become a common practice with reliable long-term results [1]. Dental implant placement in the posterior maxilla presents many difficulties, as the particular area provides a limited amount of bone volume, due to bone atrophy and hyperpneumatization of the maxillary sinus [1,2]. Short implant placement or additional procedures like external/internal sinus lifting can overcome the disadvantage of inadequate bone volume of posterior maxilla [2]. However, implant migration to the maxillary sinus still is a complication. This can occur during surgical placement or during the healing phase [3]. Implant migration into the maxillary sinus can be related with surgical inexperience, lack of grafting procedures, excessive pneumatisation of maxillary sinus and applying excessive force during implant placement [3,4]. In addition, implant migration to the adjacent sinuses such as ethmoid and sphenoid sinus have reported [4].

Foreign bodies in maxillary sinus, like dental implant, can cause deficiency of mucociliary activity, foreign tissue reactions, maxillary sinusitis [2,5]. Additionally, fungal infections or even cancer formations have been reported [5,6].

Foreign bodies in the maxillary sinuses, when very small, are removed by ciliary action. However, a foreign body as large and heavy as a dental implant would not be evacuated by this natural phenomenon [3] and should be removed to prevent the mentioned complications. 3 methods can be used for the removal of the displaced implant: suction through the implant socket (if exist), Caldwell – Luc operation via intraoral approach and endoscopic sinus surgeries [2,3].

The aim of this report is to present an implant migration after healing phase of 3 months from implant placement and removal with Caldwell – Luc operation.

Case Report

A 52-year-old male patient was referred to Erciyes University Faculty of Dentistry Department of Oral and Maxillofacial Surgery by a private dentist. The patient has bilateral edentulous posterior maxilla and the dentist had placed 4 dental implants with two-stage surgical method to premolar and molar region without any extra surgical procedure such as internal or external sinus lifting procedure. After 2.5 months from the surgery an OPG was taken for the radiologic examination of osseointegration. The dentist noticed that all implants were in the same position as the initial positions and decided to perform the second stage surgery after waiting 15 days healing period. At the third months of implant placement, when dentist made a small incision for the placing the healing caps, he noticed that a dental implant which was placed to the left tuber maxilla is missing. An OPG was taken immediately and dentist noticed that dental implant migrated to the maxillary sinus. (Figure 1) Clinical examination showed a hole which has already began to heal at the area of upper left first and second molar. A cone beam dental tomography (CBDT) was taken after clinical examination. CBCT images showed that a dental implant staying under the orbital floor and lateral side of the upper nasal concha in maxillary sinus (Figure 2).

Patient was informed and then it was decided to perform diagnostic nasal endoscopy for determining the position of displaced implant and extraction of the dental implant if possible. Endoscopic nasal approach performed through the nasal ostium but failed to find the dental implant due to unsuitable position. We decided to remove it with surgically under general anesthesia (GA).



Figure 1: Pre-operative OPG.



Figure 2: a. Coronal view of the migrated dental implant. b. Sagittal view of the migrated dental implant.

Under GA 4cc local anesthesia (ultracaine DS Forte) applied from left incisor to left third molar area to buccal and palatal mucosa of

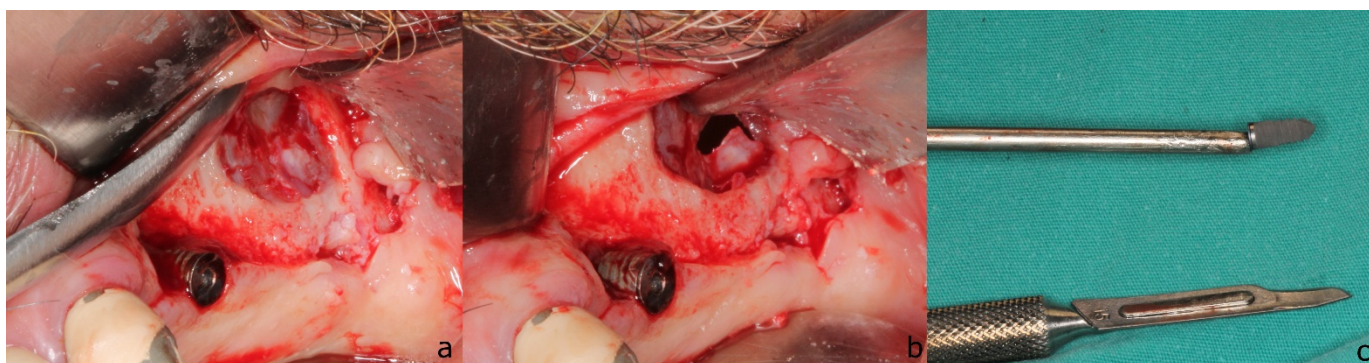


Figure 3: a. Approach to the sinus membrane via lateral bone removal. b. Approach to the maxillary sinus within penetrating sinus membrane. c. Extraction of the dental implant with surgical suction.

In present case migration of the dental implant to the maxillary sinus occurs two and a half months after implant placement. Implant migration in the sinuses may not be associated with signs and symptoms of infection, but oro-antral communication and/or infection of paranasal sinuses may occur [8]. Cases of maxillary sinusitis due to implant penetration into maxillary sinus have been reported [9,10].

Different procedures have been described for the treatment of migrated implants, although the indications may vary depending on

the left maxilla. A crestal incision and two releasing vertical incisions were performed, and full-thickness muco-periosteal flap was elevated to the area of zygomatic buttress. Lateral approach technique was applied by a bony window removal with a steel burr. (Figure 3a) It was surprising that dental implant was pulled out with surgical suction. (Figures 3b and 3c) Maxillary sinus was curetted and mucoperiosteal flap was sutured primarily with 3/0 vicryl suture. Post-operative antimicrobial therapy with 1000 mg amoxicillin 2 × 1, 100 mg flurbiprofen 3 × 1 and mouth wash with khlorhexidine 3 × 1 was prescribed. Healing period was uneventful.

Discussion

Anatomic landmarks of the jaws such as maxillary sinus, nasal fossa, mental foramen, mandibular canal can limit the implant placement [7]. Especially in the maxillary posterior area dental implant placement can be tough because of insufficient bone height and D IV bone quality.

Bone grafting procedures including internal or external sinus lifting are mandatory in case of implant placement to the posterior maxilla when the bone volume is insufficient. In addition, short implants can be used to overcome these difficulties.

In this case the dental implant placed in the maxillary posterior area without any extra surgical procedure for bone augmentation such as external or internal sinus lift and implant was placed distal side of the indicated area.

Displacement of the dental implant to the maxillary sinus occurs as a surgical complication. Over preparation of the implant socket or over insertion of the implant with the co-existence of D IV bone quality can lead to migration of the dental implant to the maxillary sinus during the implant placement. On the other hand, Gonzales-Garcia et al reported that also migration of the dental implants into the maxillary sinus can occur years after the placement [7].

the symptoms in the maxillary sinus. For instance, the sinus wall opened under local anesthesia, such as Caldwell-Luc procedure or endoscopic extraction of the dental implant from the maxillary sinus by the way of ostium. Implant bodies have been removed with the intraoral approach through the implant preparation site [11].

Endoscopic transnasal operation for the removal of dental implants from the maxillary sinus has several advantages over more conventional procedures [12]. Advantages include reduced surgical

time, less trauma, and bleeding, which often bring about a shorter time for patient recovery. However, the endoscopic nasal approach may not be feasible if the location of the implant body is not within the reach of a surgical forceps. Therefore, careful radiographic and CT evaluation is important before attempting this procedure [11].

Before removing the foreign body, a diagnostic endoscopy should be performed to evaluate the functional status of the osteomeatal complex. After diagnosing the degree of affectation of the paranasal sinuses, determining the size and the exact location of the foreign body, the indicated procedure for every case would be decided [7].

In present case we tried to pull the dental implant with nasal endoscopy via nasal ostium. Although pre-operative CBDT examination was done, the location of the dental implant and the sinus mucosa did not allow the extraction of the dental implant with nasal endoscope. So, we performed the surgery with Caldwell-Luc procedure.

Delaying retrieval could allow the implant to migrate into an adjacent contiguous sinus. One report described a delayed displaced implant removal where the implant had relocated to from the antrum to the sphenoid sinus [13]. Another reported displaced implant migrated after 8 years [14]. A migrated dental implant was also found in the ethmoid sinus, which is usually not contiguous with the maxillary sinus [15,16].

Conclusion

Implant supported rehabilitation must be well-planned pre-operatively especially in maxillary posterior region. If it is possible, CBDT examination of the edentulous area can give information about the requirement of the external or internal sinus lift.

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