



CASE REPORT

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Removal of a Dental Implant from the Maxillary Sinus by Caldwell–Luc Surgery: A Case

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Displacement of an implant into the maxillary sinus is a rare complication in dental implant clinical practice. This complication mainly arises due to an inadequate bone height and peri-implant infection. The presence of a foreign object, such as an implant, in the maxillary sinus causes sinusitis via impaired mucociliary flow and foreign body reactions. Therefore, foreign object in maxillary sinus must be removed. Caldwell–Luc surgery may be performed to remove foreign bodies and lesions from the maxillary sinus. Herein, we describe the case of a patient whose dental implant slipped into the right maxillary sinus during the insertion of the healing cap due to periimplant infection and removal of the implant via an intraoral Caldwell–Luc surgical approach. The intraoral Caldwell–Luc surgery technique proved to be a safe, reliable method for the removal of a foreign object from the maxillary sinus.

Key words: *Implant displacement, foreign body reaction, maxillary sinus, cald-well luc*

Maksiller Sinüse Kaçan Diş Implantının Caldwell-Luc Cerrahisi ile Çıkarılması: Bir Vaka Raporu

Dental implantların üst çene sinüs bölgesine kaçması klinik uygulamalarda nadir rastlanan bir durumdur. Bu durum temel olarak yetersiz kemik yüksekliği ve implant çevresi enfeksiyondan kaynaklanmaktadır. Üst çene sinüs bölgesine kaçan implant gibi yabancı cisimler, mukosilyar akıntıyı bozarak ve yabancı cisim reaksiyonuna neden olarak sinüs enfeksiyonuna neden olur. Bu yüzden üst çene sinüs bölgesindeki yabancı cisimlerin uzaklaştırılması gerekmektedir. Caldwell-Luc cerrahisi üst çene sinüs bölgesinden yabancı cisimlerin ve lezyonların uzaklaştırılması için kullanılan bir tekniktir. Bu vaka raporunda iyileşme başlığının takılması sırasında implant çevresi enfeksiyondan dolayı üst çene sinüs bölgesine kaçan bir implant vakasının Caldwell-Luc cerrahisi ile çıkarılması takdir edilmektedir. Ağız içi Caldwell-Luc cerrahisi üst çene sinüs bölgesinden yabancı cisimlerin uzaklaştırılması için kullanılacak güvenli bir yöntemdir.

Anahtar Kelimeler: *Implant kaçması, yabancı cisim reaksiyonu, üst çene sinüs, cald-well luc*

Introduction

Recently, dental implant-supported prostheses have become an acceptable and widespread treatment option for partial and complete edentulousness. Surgical placement of dental implants is difficult in the maxillary posterior bone due to the resorption of the bone and pneumatization of the maxillary sinus. To overcome these difficulties, the use of short implants and sinus elevation in posterior toothless maxilla are well-proven treatment methods. Although the aforementioned methods are intended to enhance the surgical placement of the implants in the posterior edentulous maxilla, displacement of the implant into the maxillary sinus may occur during or after surgical placement of the implant. The causes of implant displacement include inexperience, inaccurate and incomplete planning, changes in sinus pressure, autoimmune reactions, peri-implant infections or bone resorption, inappropriate occlusal forces, and bone deficiencies (1-4).

Foreign bodies in the maxillary sinus result in disruption of the mucociliary current and cause tissue reactions and sinus infections. Fungal infections and cancer following the displacement of foreign objects into the maxillary sinus have been reported. To prevent such complications, migrated dental implants should be removed from the maxillary sinus. There are three different approaches by which migrated dental implants can be removed from the sinus: absorption the implant from the socket where displaced, an intraoral approach with Caldwell–Luc Surgery (CLS), and endoscopic sinus surgery. In this case report, we describe a case in which an implant slipped into the left maxillary sinus and the treatment of this case using the intraoral CLS approach (1-7).

Case Report

A 51-year-old healthy male patient who had been diagnosed with implant slippage into the maxillary sinus was admitted to Department of Periodontology, Faculty of Dentistry, Fırat University, Elazığ, Turkey. The patient had undergone dental implant surgery due to total maxillary edentulousness. The day prior to surgical removal of the implant, one of the implants in the posterior area had slipped into the left maxillary sinus

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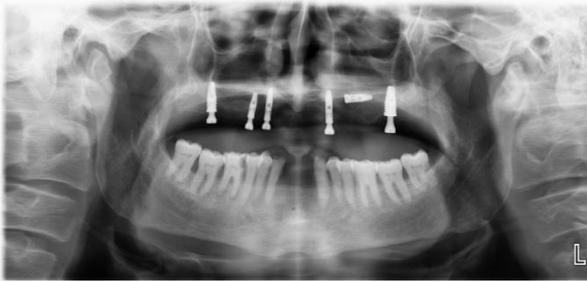


Figure 1. Orthopantomographic view of the patient before the surgery. The slippage of the implant can be detected in left maxillary sinus

while inserting a healing cap due to peri-implant infection. The clinical examination revealed mild pain in the left posterior part of the maxilla. A panoramic examination showed that the implant had slipped into the left maxillary sinus (Figure 1).

After obtaining patient consent, the patient was treated under local anesthesia by CLS. A linear surgical incision was made on the left posterior maxillary crest. After mucoperiosteal flap elevation, the lateral bone wall of the left sinus was exposed, and an access hole (size of 10×10 mm) for direct visualization was made using a round steel bur (Figure 2, 3). After bleeding control, the sinus membrane was perforated, and the slipped implant was removed. There was no significant bleeding from the maxillary sinus mucosa or the surgical site (Figure 4). Finally, the surgical area was irrigated with a sterile saline solution, and the mucoperiosteal flap was closed using 3-0 silk sutures and returned to its original position. After the surgical procedures, an antibiotic (amoxicillin/clavulanic acid combination of 1.000 mg, every 12 h), an analgesic (flurbiprofen 100 mg, every 12 h), and A chlorhexidine gluconate mouth rinse (three times a day) were prescribed for 1 wk. Patient was advised to avoid coughing and sneezing. No infections or complications were observed after the operation.



Figure 2. Mucoperiosteal flap elevation and opening the bone window on the left maxillary sinus wall



Figure 3. Removal of the implant from maxillary sinus after the perforation of the sinus membrane

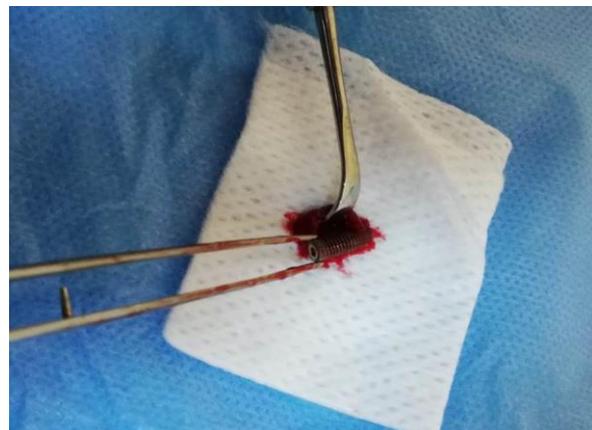


Figure 4. Removed implant

Discussion

In dental implantology, various complications, such as maxillary sinusitis, oroantral gap formation, or slippage of the implant into the paranasal sinuses during the treatment of posterior edentulous maxilla with a dental-implant supported prosthesis, have been encountered. Dental implants that have slipped into the maxillary sinus may give rise to infections, such as sinusitis, through contact with the sinus mucosa. Severe cases, such as fungal infections and cancer, have been reported in cases of foreign bodies migrating into the maxillary sinus (1-3). The factors that cause delayed implant slippage into the maxillary sinus include a change in intrasinus pressure and nose pressure, peri-implant bone destruction and infections, and failed osseointegration. In the present case, in which an implant slipped into the maxillary sinus, the implant slippage was due to failed osseointegration and peri-implantitis. Generally, in such cases, the treatment protocol is the removal of the foreign object from the sinus. The treatment options include CLS, the endoscopic technique, or a combination of both (1, 2, 8).

In the last decade, endoscopic surgery has been undertaken to minimize complications, for example, nerve damage and scars after skin incisions. Barrault (9) was the first to describe the usefulness of endoscopic surgery for diseases of the maxillary sinus, as it removed the need to cut soft tissue and bone in many cases. Kitamura et al. (10) reported a case of endoscopic removal of a dental implant in the sinus using a transnasal approach and reported that the endoscopic surgical approach caused less morbidity than that found with more common methods, such as CLS. Although endoscopic surgery has many advantages, there are also disadvantages associated with this procedure. The first major disadvantage of endoscopic surgery is that the procedure requires specific training, equipment, and general anesthesia. The next main disadvantage is related to the size of the foreign object: If the object is large or accompanied by a dental cyst, it cannot be retrieved using the endoscopic technique. In these cases, the surgeon should consider a classical approach, such as the CLS procedure with local anesthesia (2). In a recent case, Eltas et al. (1) used CLS to remove implants from both maxillary sinuses. Despite the minimally invasive nature of endoscopy, they selected not to use the endoscopic method because of the restricted size of

the operative site and the location of the implants (i.e., near the posterior wall of the maxillary sinus). Based on our experience in the present case, CLS appears to be a reliable procedure, which provides superior visibility, with a limited incision, and it respects the integrity of the sinus. Risk factors in traditional intraoral CLS include infraorbital nerve damage, buccal soft tissue retraction, mucosal scar tissue, oroantral gap formation due to incomplete periosteal closure, and inadequate amounts of bone that require placement of a second implantation (1). We did not encounter any of the above-mentioned complications in this case.

In conclusion, implant displacement into the maxillary sinus or paranasal sinuses is a rare but well recognized complication in dental implantology. In such cases, the implant must be removed, as it may cause a foreign body reaction in the sinus. In cases where the implant is displaced into the posterior or anterior region of the maxillary sinus, it may be difficult to remove. CLS is preferable to endoscopic sinus surgery in such cases for the following reasons: Endoscopic sinus surgery is performed with a small window; it has a limited ability to access the base, posterior, and anterior areas of the maxillary sinuses; and it cannot remove large-sized objects.

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