

Displacement of an Implant into the Maxillary Sinus: A Report of a Rare Surgical Complication and Treatment Options.

Anand Farias*, Sushma Ramaswamy, Haifa B, Nithika Manohar, and Manoj Varma.

Department of Prosthodontics, Srinivas Institute of Dental Sciences, Srinivas Integrated Campus, Mukka, Suratkhali, Mangalore 575021, Karnataka, India.

Case Report

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*For Correspondence

Department of
Prosthodontics, Srinivas
Institute of Dental Sciences,
Srinivas Integrated Campus,
Mukka, Suratkhali, Mangalore
575021, Karnataka, India.
Mobile +91 9845100816

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ABSTRACT

Restoration of the posterior maxilla with reduced bone height and pneumatized sinus is a challenge to the implant surgeon. The surgeon has the option of a direct sinus-lift approach or an indirect blind approach. Both of which have its own complications. Displacement of an implant into the maxillary sinus is rare occurrence and normally seen after the implant has been in service for a number of months. The displacement of an implant at the time of surgery is even rarer. This report presents a case of an implant displaced into the maxillary sinus during first stage surgery and discusses its possible cause, management and follow-up.

INTRODUCTION

Dental Implantology has evolved from a treatment option for total edentulous patients to a no-holds-barred option for the replacement of missing teeth. A few conditions however still pose a challenge to the implant surgeon; one of these being the restoration of the posterior edentulous maxilla. The presence of a pneumatized sinus along with a poor bone quality compromises primary stability necessitating the sinus augmentation procedures to obtain vital bone and the utilization of this bone for long-term survival of the restoration [1,2].

Loss of an implant into the maxillary sinus has been documented over the last 20 years and can occur at various stages of implant therapy – from rare intra-operative displacement to migration after first stage surgery and most commonly after the implant has served with a loaded prosthesis for a period of time [3,4,5,6,7].

This report presents a case of an implant displaced into the maxillary sinus during first stage surgery and discusses its possible cause, management and follow-up.

Case Report

A male patient, aged 46 years was referred to the implant clinic by his general surgeon for the restoration of his missing teeth with dental implants. Routine radiographic investigations were carried out it was determined that there was reduced bone quantity at the site. It was planned to place two implants in the posterior region using an in-direct staged sinus floor elevation (SFE) for the region of the missing first molar. (Figure 1).

The first implant (Ankylos® Plus A9.5, Dentsply-Friadent, Mannheim, Germany) was successfully placed in the position of the missing second premolar. In-direct sinus elevation in the region of the missing first molar was performed with bone compression instruments (Bone Compression Kit, MiS-Implants). The implant was placed into position (Ankylos® Plus A8, Dentsply-Friadent, Mannheim, Germany). While disengaging the implant mount from the implant, the surgeon recorded movement of the unit and observed disengagement of the mount with loss of visibility of the implant in the osteotomy. Immediate radiographs showed that the implant had been displaced into the maxillary sinus. (Figures 2 and 3).

The patient was informed of the situation and the possible treatment options. The patient decided to opt for a conservative treatment option and requested that the site be restored. The same was noted in the file and the surgeon proceeded and successfully placed a second implant (Ankylos® Plus B8, Dentsply-Friadent, Mannheim, Germany) at the site. Post-Operative radiograph showed that the lost fixture had migrated upwards in the sinus. (Figure 4).

Follow-up treatment one month later showed that the implant had migrated posteriorly and was at the base of the sinus with a change in angulation (Figure 4). A three month radiograph showed that the implant was located vertically at the lateral wall of the maxillary sinus (Figure 5).

Figure 1: Pre-Operative Situation



Figure 2: Intra-Operative Radiograph taken immediately after detecting loss of implant fixture



Figure 3: Intra-Operative Radiograph taken immediately after detecting loss of implant fixture

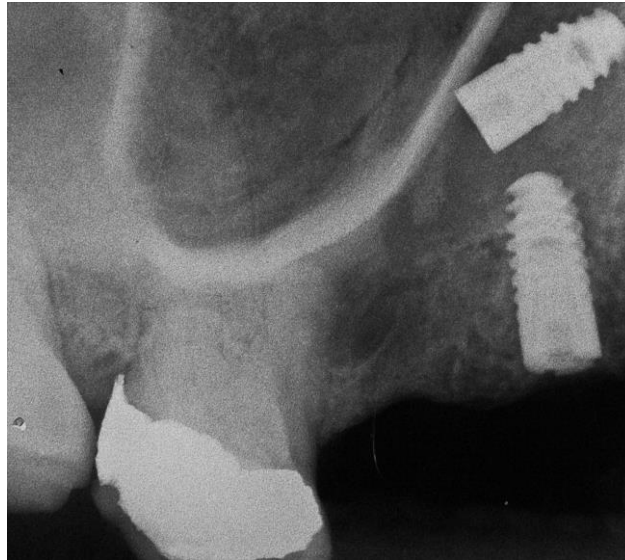


Figure 4: Post-Operative Radiograph



Figure 5: Three month post-surgical radiograph



The two implants at the edentulous site were found to be successfully osseointegrated, three months following first stage surgery and crowns were provided to the patient. The patient has been on regular follow-up with his regular dentist for 4 years and is presenting as asymptomatic.

DISCUSSION

The sinus augmentation is a reliable and predictable procedure [8] [9]. The need to reduced trauma to the patient has resulted in implant surgeons opting to utilize a crestal-indirect approach to lift the sinus and gain vertical height for the placement of implants. This procedure is not without its own set of complications.

Most reports present cases of displaced implants that have displaced into the sinus after restoration and not during surgery. Literature describing cases of displacement during surgery is limited [10] [11]. Displacement into the sinus can result in maxillary sinusitis, infection and other complications [1,3,12]. However it has also been reported that the displaced in implant can also remain asymptomatic [7, 13] leading to development of two lines of treatment for such case [1].

Conservative Treatment Option

A conservative treatment plan is a wait-and-watch plan where the displaced implant is left in the sinus and regular radiographic and clinical follow-up is performed. Many patients choose this treatment option to avoid additional surgery [1].

Surgical Option

A surgical option warrants the immediate removal of the implant. The approach is based on the premise that a displaced implant is a foreign object that will cause immediate harm to the patient and thus has to be removed via an endoscopic sinus surgery or a Caldwell-Luc like Surgery [3, 14, 15, 16, 17, 18].

Various hypotheses have been put forward for delayed displacement of an implant into the sinus [6]. Varol et al [19] have put forward possible reasons for displacement of the implant during surgery such as the one in the case presented. Based on their hypothesis, one could limit the reason in the present case to one of the following: (1) the existence of an untreated perforation of the antral base after initial drilling of the implant bed or (2) excessive tapping of a dental implant during an internal SFE procedure and (3) lack of primary stability after implant placement.

On retrospective analysis of the case, it could be reasoned that the complication could have been avoided if a dental CT-Scan had been performed and the bone density of the bone at the base of the sinus had been determined. If the results of the scan showed low bone density, a direct sinus lift utilizing a lateral window approach with grafting and placement of the implant (i.e. after graft consolidation) could have been performed and would have been a safer treatment plan with the associated risks of the lateral window approach.

CONCLUSION

The case presented is a case of iatrogenic displacement of a dental implant into the maxillary sinus. It can be classified as is a complication of stage sinus floor elevation using the indirect sinus lift procedure. It can thus be stated that without doubt, careful selection of pre-operative imaging is necessary and dependent on the case at hand. For a sinus elevation procedure, conventional radiographs should be supplemented with a CT data or Cone Beam CT Data whenever feasible to the patient and must be recommended by the attending surgeon for all cases. Patient's refusal to undergo the CT-scan should be documented in the case file to avoid medico-legal complications in case a complication such as the one presented does arise.

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