

Complications of the Sinus Lift Procedure

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Abstract



The sinus lift is one of the most common procedures performed to increase the height of posterior maxilla for placement of dental implants. It is a sensitive area

which is prone to complications, the most common being sinus membrane tear and bleeding. This article discusses some of the complications associated with sinus lift procedure

KEY WORDS: Sinus lift, complications, sinus membrane

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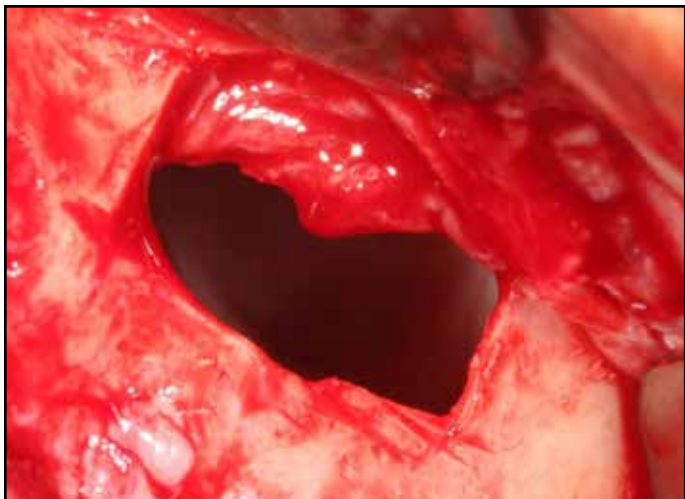


Figure 1: Sinus membrane perforation.

INTRODUCTION

Placement of dental implants has become an indispensable treatment modality when treatment of missing teeth is considered. The prime requisite for dental implants is the presence of good bone, thus bone grafting is carried out wherever bone is deficient. There is vast literature which states that sinus expands in the absence of teeth resulting¹ in thin bone incapable of placement of implant placement, in such cases bone grafting is done via direct or indirect sinus lift, increasing the height of bone in posterior maxilla. This procedure was first described by Dr. Hilt Tatum at an Alabama implant conference in 1976 which opened doors to new techniques and opportunities for replacement of missing teeth.

However, maxillary sinus is a delicate area and there are many vital structures which should be considered, also proper treatment planning is involved, which if not considered can result in catastrophic results. The most common being sinus membrane tear, placement of implant in deficient bone height and dislodgement of implant in the sinus cavity. This article discusses some of



Figure 2: Mucocele.

the most common sinus lift complication which can be encountered during the surgery, which are summarized in as follows:³ 1) Intraoperative: Bleeding, buccal flap tear, infraorbital nerve injury, membrane perforation; 2) Early postoperative: incision line opening, bleeding, barrier membrane exposure, infraorbital nerve paresthesia; 3) Late postoperative: graft loss/failure, implant failure, oro-antral fistula, implant migration, inadequate graft fill.

Intraoperative complications can arise during any surgical procedure, the most common of which is membrane perforation (Figure 1) occurring in about 7-44% of procedures.⁴⁻⁶ This can further lead to acute or chronic sinus infections, loss of grafting material and the disruption of normal sinus physiology.^{3,6} In such cases no grafting procedure should be carried out and the site can be re-opened after 2-3 weeks when the membrane has repaired itself. However, few authors advocate grafting even in cases of membrane tear as no association between the membrane perforation and the implant survival has been found.^{3,6} Certain anatomical factors such as sinus septa, mucosal swelling, mucoceles



Figure 3: Dislodged implant in the maxillary sinus.

(Figure 2), narrow sinus or osteotomy design or an increased lateral wall can increase the risk of membrane perforation. Thus such the site should be free of pathologies before sinus lift.

Bleeding is another common complication, slight bleeding from the surgical site is a normal phenomenon of any surgery, and bleeding from soft tissues is of short duration however, if profuse bleeding occurs one should consider the possibility of damage or severing of the artery or branches of the vascular supply of the lateral wall of the sinus and the surrounding soft tissue or damage to the posterior lateral nasal artery. All efforts should be done towards control of the bleeding, only when clinician is sure of no hemorrhages, bone grafting procedure can be commenced.

Displacement of dental implants to adjacent anatomic structures (Figure 3) is another reported complication. This occurs when proper treatment planning is not done and there is no initial stability of the dental implant placed which occurs in cases of insufficient bone height and quality. Displacement of an implant may further cause serious consequences such as sensory disturbance,



Figure 4: Post-operative opening of suture line.

maxillary sinusitis, oroantral fistula. The migration of such implants in the ethmoid, sphenoid sinuses, orbit, nose and anterior cranial fossa is much more sporadic⁷⁻⁹ other reasons for such displacement are poor surgical skills of the operator, the presence of an uncured perforation, too much implant tapping or the application of an excessive force.¹⁰ Another reason could be autoimmune reaction to the periimplant bone destruction caused by the implant, which leads to the loss of integration¹¹ Caldwell-Luc technique has been proposed to retrieve dental implant or any foreign body material from the sinus, however sometimes implant may be embedded further up towards the orbit, causing retrieval difficult. This results in extra surgeries and expenditure for the patient.

Early post-operative complications such swelling or slight bleeding from the surgical site are common and transient. Complications such as exposure of the underlying membrane due to opening of suture line (Figure 4) mainly occur due to excessive swelling. Thus post operative instructions should be clearly given and should be reinforced on the patient. Late complications

of the surgery include loss of the graft causing implant failure. This may also lead to implant migration in other anatomical structures as aforementioned and oroantral fistula. According to the literature, acute postoperative sinusitis occurs as a complication in up to 4.7% of sinus graft procedures.¹² Rhino sinusitis is a well-known complication associated with the sinus lift procedures where surgical treatment is required to further stop the spread of infection.¹³⁻¹⁴ Most often the infection appears after more than one week of the surgery. According to the literature it has been shown that 3-20% of patients who have predisposing factor for sinusitis are at risk of developing postoperative transient sinusitis.

CONCLUSION

The sinus lift is a common procedure yet it is prone to complications, some of which may become life threatening especially when a dental implant gets dislodged in the sinus cavity. ●

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Disclosure

The authors report no complications with anything mentioned in this article.

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