

INDIRECT SINUS LIFT:A CASE REPORT

Dr. Gaurang Mistry

Dean and H.O. D, Department of Prosthodontics, D.Y. PATIL (Deemed to be University) School of Dentistry

Dr. Kunal Mehta

Associate Professor, Department of Prosthodontics, D.Y. PATIL (Deemed to be University) School of Dentistry

Dr. Mishal D'Souza

Associate Professor, Department of Prosthodontics, D.Y. PATIL (Deemed to be University) School of Dentistry

Dr. Foram Dama

Postgraduate students, Department of Prosthodontics, D.Y. PATIL (Deemed to be University) School of Dentistry

Dr. Nilay Karnik

Postgraduate students, Department of Prosthodontics, D.Y. PATIL (Deemed to be University) School of Dentistry

Dr. Simran Karna

Postgraduate students, Department of Prosthodontics, D.Y. PATIL (Deemed to be University) School of Dentistry

ABSTRACT

Placing implants in the maxillary posterior region should always evaluate the maxillary sinus and the anatomical landmarks. Various changes occur after extraction of the teeth such as a decrease in bone height, pneumatization of the maxillary sinus, and many more. Placing an implant in the edentulous posterior maxillary region will be difficult if the maxillary sinus is in close approximation to the crestal bone. Various sinus augmentation techniques are available to increase bone height. The technique which is safe to use could be an indirect sinus lift procedure. The sinus lift procedure provides adequate stability and additional anchorage of the implants. This case report presents maxillary sinus lift procedure using indirect method.

Keywords: Indirect sinus lift, sinus floor, dental implants, augmentation.

INTRODUCTION

Implants have been widely replaced the removable prosthesis due to comfort, aesthetics, speech, and hygiene.[1] The maxillary sinus remains normal when the posterior teeth are present but changes its shape and expands when the teeth are lost and as the age increases.

Pneumatization of the sinus occurs after the loss of teeth in the posterior maxillary region and is common. The sinus floor augmentation will help to increase adequate ridge height by 3-5 mm which will help in successful implant placement.[2] The posterior maxilla often seems to have decreased bone quantity because of the trabecular bone which is finer than other areas. The resorption is accelerated by the vascularisation of the alveolar bone.[1] A sinus lift procedure is done to elevate the sinus membrane to create subantral space which will increase the vertical bone height.[3] There are various types of bone graft materials used such as homogenous, autogenous, heterogenous grafts as well as synthetic biomaterials.[4] Proper diagnosis of the anatomical landmarks and bone morphology is essential for proper treatment planning. A sinus lift procedure can be a direct or indirect technique. The indirect method is done with the osteotome technique with a crestal approach. Crestal approach is more commonly used than the lateral window for the elevation of the sinus and implant placement.[5] This procedure is less invasive, takes less time for the procedure, and provides less trauma to the underlying tissues as compared to the lateral window direct sinus lift procedure.[6]

CASE REPORT

The patient reported to the department of Prosthodontics and Implantology at D Y Patil University, school of dentistry, Navi Mumbai, with a chief complaint of missing teeth on the right side. On oral examination, it was found that his first maxillary molar was missing. Pre-operative evaluation of the patient was done including the gingival health, inter occlusal space, bone tomography with ridge mapping technique, and pre-surgical measurement of the alveolar bone height to the sinus floor was measured using standard IOPA & CBCT scan.

Alveolar bone height was found to be 6.2mm from the sinus lining. After completing oral and radiographic evaluation two-stage surgery was planned with indirect sinus lift through an alveolar crestal approach. A self-threaded tapering acid etch implant with 10mm length and 4.2 mm diameter was selected.

Surgical Steps included:

- Posterior superior alveolar and greater palatine nerve blocks were given along with local infiltration with 2% lignocaine with 1:80000 adrenaline (Lignox) concentration.
- A mid crestal full-thickness incision was given on the palatal side of the crest with two releasing incisions.

- A full-thickness mucoperiosteal flap was reflected and retracted.
- After reflection surgical stent was placed over the site and a round bur was used for marking implant position on the bone using a 1:20 reduction gear hand piece at 1000rpm and 35 Ncm torque along with copious irrigation of normal saline to prevent thermal injury to the bone.
- Pilot drill of 2.0mm diameter with a stopper at 5mm was used to prepare the implant site 1mm short of the sinus lining. An IOPA was taken to confirm the proximity of the sinus to the drill.
- Consecutive drill of 2.8mm with stopper was then used up to the same length to increase the width of the site.
- Small amount of bone graft was then mixed with patients' blood and placed in the implant osteotomy site using a graft carrier.
- The sinus floor was then fractured with osteotomy of 2.7mm diameter with gentle tapping using a mallet.
- The implant osteotomy site is then prepared to the full dimensions by osteotomy of consecutive increasing diameter. This technique helps in compacting bone laterally and apically around the implant osteotomy site.
- The implant was placed gently into the prepared site and tightened with the help of a torque ratchet at 40 Nm torque. The implant placement will further help to push the bone graft material upward leading to the lifting of the sinus lining 2mm ahead.

After checking the primary stability of the implant a titanium cover screw provided with the implant was placed. Post placement IOPA was taken to confirm the position of the implant.

The mucoperiosteal flap was then repositioned and sutured with the help of 3.0 black silk (Nuvosilk).

The patient was prescribed antibiotics and post-operative instructions were given. Suture removal was done after seven days.

Post 4 months of implant placement after evaluation of the Osseo integration of the implant a metal ceramic crown was fabricated and cemented onto the abutment placed on the implant.



Fig 1: Preoperative Frontal View



Fig 2: Bite in Protrusive



Fig 3: Maxillary Occlusal View



Fig 4: Mandibular Occlusal View



Fig 5: Preoperative RVG



Fig 6: Post Operative RVG



Fig 7: Shade Selection



Fig 8: Maxillary Post Operative Occlusal



Fig 9: Post Operative Frontal View



Fig10: Post Operative Lateral View



Fig 11: Post Operative Smile

DISCUSSION

Edentulous maxillary arch has numerous anatomical and physiological limitations such as deficiency of spongy maxillary alveolar bone, accelerated pneumatization of the maxillary sinuses and reduction in vertical bone height. These factors render rehabilitation of the

location very challenging. So sinus lift elevation plays an important role in placing implants.[7] There are two methods direct and indirect and both have their advantages and disadvantages. The indirect technique is less invasive and less traumatic as it uses osteotome to elevate the sinus floor. In the indirect technique, the alveolar bone present acts as a readymade graft, and the space created between the floor and the prepared site will help in the placement of the implant in the sinus cavity behind the bone. There are no such complications observed after the indirect sinus lift procedure. The indirect technique is the crestal approach whereas the direct technique is the lateral window approach.[8] The disadvantage of an indirect sinus lift is chances of errors are more as it is a blind procedure. In direct technique, a window is created with the help of a piezo instrument. The advantage of the direct technique is one can get direct access and the sinus membrane can be directly visualized. Disadvantages of the direct technique include more discomfort after the procedure and more chances of susceptible infection. In indirect technique excellent primary stability can be achieved in cases like immediate extraction with the help of the use of osteotomes rather than drills by compressing the sinus floor that will condense the bone laterally and help in proper bone-to-implant contact.[8] Complications like sinusitis can occur if perforation of the membrane occurs or the filling material enters the sinus cavity.

Conclusion

Implant placement with reduced vertical bone height can be well treated with an indirect sinus lift procedure through crestal approach with the help of an osteotome. This procedure is less invasive, less time-consuming, and less traumatic and the bone available itself acts as a graft. Primary stability of the implant is well achieved by this procedure with fewer complications. This procedure can also be performed in complicated cases of the maxilla and the results are beneficial.

References

1. Misch CE. Dental Implant Prosthetics. Second Edition. St. Louis, MO: Elsevier Mosby; 2015. Rationale for dental implants; pp. 1–25.
2. Sinus floor elevation utilizing the transalveolar approach. Pjetursson BE, Lang NP. *Periodontol* 2000. 2014;66:59–71.
3. Aruna Wimalarathna. Indirect Sinus Lift: An Overview of Different Techniques. *Biomed J Sci & Tech Res* 33(4)- 2021. BJSTR. MS.ID.005447.

4. Cardoso CL, Curra C, Santos PL, Rodrigues MFM, Ferreira Junior O, et al. (2016) Current considerations on bone substitutes in maxillary sinus lifting. *Rev Clin Periodoncia Implantol Rehabil Oral* 9(2): 102-107.
5. Ebenezer V, Balakrishnan R, Nathan S. Indirect Sinus Lift in Immediate Placement of implant –A Case Report. *Biomed Pharmacol J* 2015;8
6. Raghoobar GM, Timmenga N M, Reintsema Stegenga B, Vissink A, Maxillary bone grafting for insertion of endosseous implants, results after 12 to 124 months, clinical oral implants *Res* 2001;12:279-86.
7. Daniel D, Rao SG. Evaluation of increase in bone height following maxillary sinus augmentation using direct and indirect technique. *J Dent Implant.* 2012;2:26–31.
8. Hahn J. Clinical uses of osteotomes. *J oral implantol* 1999;25:23.