

Ridge Augmentation of Posterior Maxilla Using Lateral Approach for Sinus Lift: A Case report

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ABSTRACT

Background: Placing implants in the posterior maxilla is challenging at times owing to poor quantity of bone and pneumatization of the maxillary sinus. In a patient desirous of implant related prosthesis, there arises a need to augment the bone height. The maxillary sinus lift technique using a lateral approach is frequently used for bone augmentation. This article reports one such treatment option for augmenting bone to place an implant.

Keywords: Maxillary sinus, Maxillary ridge augmentation, Dental implants.

INTRODUCTION

Progressive resorption of the residual alveolar ridge occurs both in horizontal and vertical directions with a resultant decrease in bone height and width. Pneumatization of maxillary sinus further complicates this situation. Increasing awareness regarding the advantages of dental implants has led to an increase in the number of patients opting for implants as a preferred treatment choice. When encountered with deficient height of bone, the treatment options of augmenting bone height using the lateral approach is proven to be predictable and effective¹. And thus this approach was chosen to treat a case of bone deficiency in the posterior maxilla.

CASE REPORT



A 30 year old male patient reported to the Department of Prosthodontics, Panineeya Mahavidyalaya Institute of Dental Sciences with

a complaint of missing back teeth in the upper arch. As he was being explained the various treatment options for restoring lost teeth, he showed considerable interest in the implant prosthesis. When a diagnostic orthopantomogram (OPG) (Figure 1) was taken to evaluate the general condition of the dentition, it was seen that the amount of bone present in the edentulous region was less than what was required for comfortable placement of implants. He was then referred to the Department of Periodontics for ridge augmentation. From the OPG, the height of bone near the sinus floor was observed to be just about 1 – 2 mm which can be classified as Vertical Ridge Height (VRH) 4 according to Cohen² (Table 1).

The patient was explained about the surgical procedure and an informed consent was obtained. An initial phase of oral prophylaxis was performed and oral hygiene instructions were given. In a subsequent visit after two weeks, the sinus lift procedure was performed. The patient was premedicated with Amoxicillin 500 mg which is a bactericidal drug, thrice a day starting on the day of

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Fig 1: Pre operative OPG showing pneumatization of right maxillary sinus.

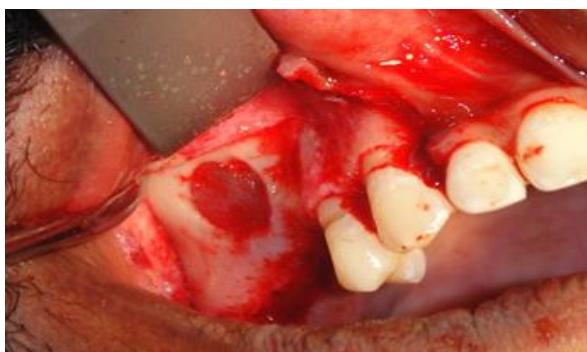


Fig 2: Oval window on the lateral surface of maxilla.



Fig 3: Bone Graft Placed.



Fig 4: Closure of the surgical wound with Vicryl sutures.



Fig 5: Post op OPG showing bone graft in place.

Table 1: Vertical ridge height classification given by Edward S. Cohen

	Bone height	Treatment
VRH-1	≥ 12 mm	Immediate implant placement
VRH-2	$\geq 7-10$ mm	Osteotome technique Immediate implant placement
VRH-3	≥ 5 mm but ≤ 7 mm	Osteotome technique or Lateral sinus augmentation Immediate implant placement(requires initial implant stability)
VRH-4	≤ 4 mm	Lateral sinus augmentation Delayed implant placement of 6 – 8 months Implant placement for 6 months

surgery to be continued post surgically for 6 days. Dexamethasone 4 mg was administered intra muscularly 30 minutes before surgery. Etoricoxib 90mg was the analgesic used pre and postoperatively.

Under local anaesthesia, a crestal incision was given in 15-16 region using a B.P blade No.15. The crestal incision was given slightly on the palatal aspect of the ridge instead of being exactly mid crestal so as to have sufficient amount of keratinized gingiva to facilitate good primary closure. The incision was extended anteriorly along the gingival sulcus till the distal surface of 12, where a vertical releasing incision was given. Posteriorly the incision extended between 17 and 18. No releasing incision was given posteriorly (Figure 2).

After a full thickness flap reflection was done to expose the lateral surface of the maxilla, the process of antrostomy was started with sterile saline irrigation using a micro motor straight surgical hand piece and a round diamond bur. An oval window was made and a portion of the lateral wall was removed, exposing the Schneiderian

membrane. The bony wall was carefully preserved to be incorporated into the maxillary sinus along with the graft material. Once the Schneiderian membrane was visible, it was carefully separated from the bony walls using manual instruments meant specifically for that purpose. After ascertaining that sufficient reflection of the membrane has been done for placement of an implant, the cavity was filled using bovine derived demineralized bone matrix (Figure 3). A bovine type I collagen guided tissue regeneration membrane was placed to improve long term implant survival³. The flap was then sutured using Vicryl 4-0 resorbable suture material (Figure 4). Immediate post-op OPG was taken (Figure 5) showing placement of bone graft.

DISCUSSION

Maxillary posterior partial or complete edentulism is one of the most common conditions seen in dentistry⁴. It presents many challenging situations, especially if implants are considered because of ridge resorption, reduced bone density⁵, increased occlusal forces⁶ and pneumatization of the maxillary sinus⁷. Grafting of the maxillary sinus to overcome the problem of reduced vertical bone height has become a regular and predictable procedure. In 1983, Misch observed that the most predictable region to grow bone height is on the maxillary sinus floor once the sinus mucosa has been elevated.

There are two approaches for augmenting bone on the sinus floor. The indirect technique developed by Summers⁸ uses osteotomes to access the sinus via the crestal approach to increase the height by 3-4mm, and it can be done when around 6 to 7 mm of bone is present. In this technique bone is compacted laterally and apically around the implant using osteotomes.

The second approach is direct sinus lift using a lateral approach when the bone height is lesser than 5 -6 mm. Since this patient had negligible amount of bone, direct sinus lift technique followed by delayed implant placement after a period of 6 months depending on the clinical assessment was used.

There is a wide variety of graft materials available for use. There are many factors governing

their use like volume of bone required, cost, availability and most importantly comfort of the clinician. Most of the graft materials reported seem to provide satisfactory results². Keeping the patient's affordability in mind, a bovine derived demineralized bone matrix (xenograft) was used.

Sinus elevation surgery is now a fairly routine procedure, and the survival rate of implants associated with this procedure usually exceeds 90%^{3,9}. However many complications¹⁰ may arise causing a delay in treatment time, the most common being Schneiderian membrane perforation while making the osseous window for accessing the sinus¹¹. Hence it is important that proper treatment planning be done and surgery performed carefully under aseptic conditions to get the best long term results for the patient.

CONCLUSION

This case report describes a technique for direct sinus lift of the maxilla using a surgical approach for a two stage implant placement. Since reports have described this technique as quite predictable this approach may be routinely used for placing implants in an atrophic posterior maxillary region by clinicians. But the biomaterials which are used for regeneration – bone grafts and GTR membrane, during the process make this procedure expensive. If an economical and predictable alternative is present, this technique can benefit a greater section of the population.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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