

Putty Assisted Sinus Augmentation: The “Pasa Technique” Discussion and A Descriptive Case

Lanka Mahesh, Glenn Mascarenhas, Sagrika Shukla, Tanvi Paliwal, Zara Dhawan

ABSTRACT

GBR with bone graft for sinus augmentation are well established techniques in implant dentistry. Technique based on PASS principle has predictable regeneration and wound healing after implant placement. Implant design and its surface characteristics also play a major role when sinus augmentation and implants are placed simultaneously.

INTRODUCTION

Sufficient bone quality is required for dental implant placement. When the teeth are extracted in posterior maxillary region, bone density decreases and pneumatization of bone occurs i.e. expansion of sinus involving the residual ridge area.¹ To do sinus augmentation direct or indirect techniques are used along with or without GBR and bone graft.² Pass principle is recommended that includes: tension free coverage and wound healing, angiogenesis, adequate space for bone to heal after graft and stability of wounds and implants during simultaneous placement of Implants and sinus lift procedure.³ In this case report implant placed along with sinus lift and GBR with an ossifying scaffold.

CLINICAL CASE

A 62-year-old healthy male visited the dental office with an inability to chew. A cone-beam computed tomography (CBCT **Figure 1**) scan showed that there were teeth with severe bone loss in bilateral upper posterior region requiring extraction; a failing implant was also seen in the upper right quadrant on the left side, since he had pain in the implanted region he decided to get the right side treated first, which involved removal of the failing implant and placement of three Bioner TOP DM implants (all implants of 5/8.5 mm) and a CAD PFM restoration. The floor of the sinus was very close to the alveolar crest. (RBH varied between 3-5 mm). The patient reported for the treatment of the left side with a loss of the first molar (**Figures 2a & 2b**). Second premolar was kept solely as an occlusal stop to prevent pressure on the operated area.

As the ridge height from the sinus floor to the alveolar crest was in the range of 5-7 mm, it was decided to go ahead with a crestal sinus lift to enable the placement of a 5/10 mm implant. A full thickness mucoperiosteal flap was elevated using mid crestal and crevicular incisions. The osteotomies were prepared 1 mm short of the sinus floor using stopper drills supplied with the implant system (**Figure 3**). Then a round headed osteotome was



Fig 1: Pre operative CBCT

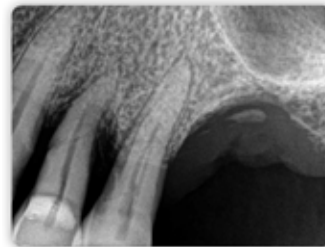


Fig 2a



Fig 2b

Figure 2: Preoperative Radiograph

used to create a green stick fracture of the sinus floor. The Schneiderian membrane was then protected and the perforations for dental implants were performed. The final 4.3 mm drill was inserted to only half the depth of the osteotomy to attain greater primary stability of the implant (**Figure 4**). Cortical perforation was performed. Powerbone Putty (Powerbone, Turkey) Bone graft was gently pushed to elevate the sinus membrane with hydro dynamic pressure (**Figure 5**). Implants of 5/10 mm (Bioner Top Dm, Barcelona, Spain) were placed at 30 NCm torque (**Figure 6**). The area of buccal dehiscence was covered with a volumax membrane (Dentsply Sirona, Germany) (**Figure 7**). An RVG taken immediately showed excellent bone fill of the sinus a submerged protocol is followed in all such procedures (**Figure 8**). 3-0 vicryl sutures were placed (Ethicon J&J) and blue M gel was applied over the area to promote faster healing (**Figures 9a & b**).

After 5 months of uneventful healing the implants were exposed and ISQ values were checked with a penguin RFA unit with readings of 76 and 77 (**Figure 10**). Tooth 24 was extracted at the same surgical visit and the area was allowed to heal for 2 weeks following which the implants were restored with a CAD PFM restoration. 1 year post OP CBCT shows excellent stability of the implanted site (**Figures 11a & b**).



Fig 3: Primary Osteotomy



Fig 4: Final Osteotomy



Fig 5: Putty Placement

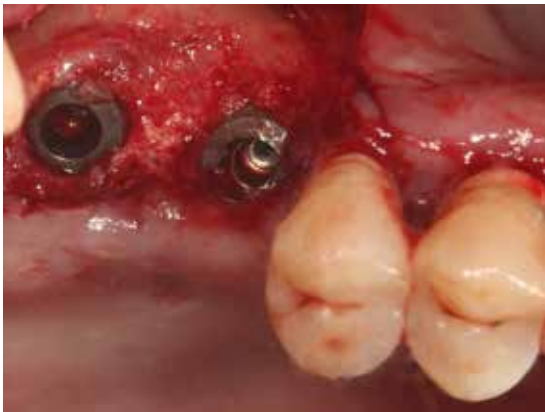


Fig 6: Implant Placement and second premolar kept as an interim Vertical Stop



Fig 7: Membrane Placement

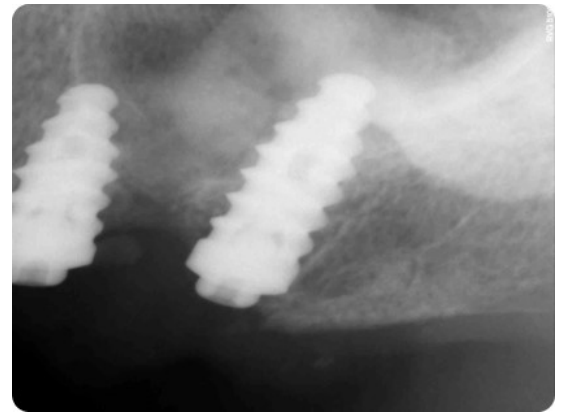


Fig 8: Immediate Post Operative With Bone Graft

DISCUSSION

The rehabilitation of partially or totally edentulous patients with implant-supported prostheses has become common practice in dentistry; however the posterior maxilla represents a challenge because of alveolar ridge resorption and maxillary sinus pneumatization.⁴ The maxillary sinus elevation technique (sinus-lift) is one of the most commonly used strategies for dental implant rehabilitation in atrophic posterior maxillae. Some of the authors consider that, when sinus pneumatization is relevant (residual height of <4 mm), sinus-grafting procedures can be safely and predictably used; However, it is not clear whether both implants and sinus-lift-grafting could be performed within the same surgical procedure.⁵ When the residual bone height belongs to class C (residual bone height 4-6 mm), a lateral approach involving a grafting material with immediate or delayed implants is advocated; when the residual bone height belongs to class D (residual bone height 1-3 mm), a lateral approach involving a bone grafting material and delayed implant placement is recommended.⁶ Bioner implant has the surface which is double etched instead of sandblasting which make is contaminant free as well as design makes it suitable for immediate placement.⁷ Fluoride free Blue M gel was used to promote healing. It has xylitol and honey (plaque control), sodium perorate

(accelerate tissue remodeling and plaque control), methyl salicylate (antiseptic), lactoferrin (bone growth factor) with neutral pH value.⁸ This present Clinical case demonstrates that performing a single step for the sinus floor elevation, grafting and dental implant placement has a high success rate. No change in the crestal bone level was seen after loading without any complications.

CONCLUSION

The long-term evaluation of sinus grafts has been evaluated based on the implant survival. Implants placed with sinus lift grafts had superior results than those placed without grafts. Angulated or short implant success rates are unpredictable. The procedure of direct or indirect sinus lift technique needs a sound knowledge of bone and sinus anatomy, preoperative evaluation, diagnosis, proper surgical techniques, regular recalls, and review.

References

1. S Devameena, D S Dinesh, G Lakshmi Devi, G Shanmugavadivel. Sinus lift procedures in dental implants: A literature review on techniques, recommendations and complications. Indian J DentSci2020;12:180-6.



Fig 9a: Sutures Placed 3-0 Vicryl



Fig 9b: Blue M Gel



Fig 10: Penguin Rfa Reading

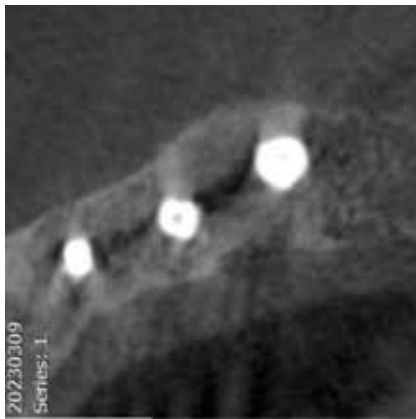


Fig 11a: Post op panoramic view of CBCT

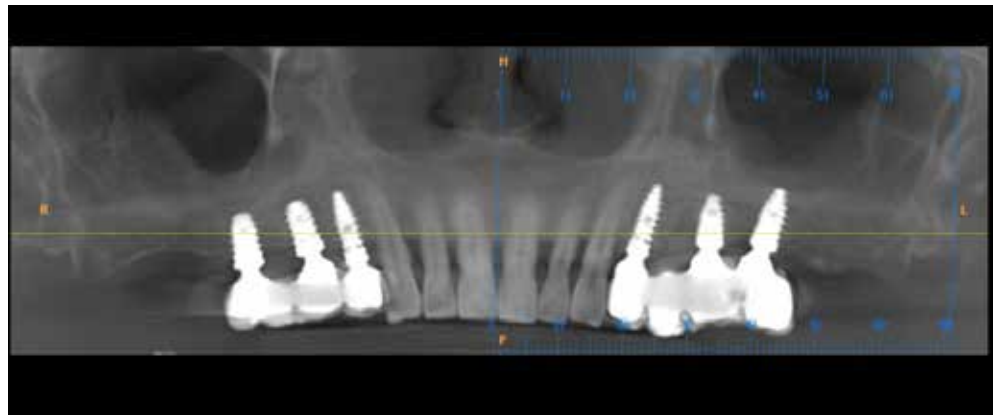


Fig 11b: OPG Post Operative

2. Carl E. Misch. Contemporary Implant Dentistry. 3rd ed.. St. Louis: Mosby; 2008.
3. Wang HL, Boyapati L. "PASS" principles for predictable bone regeneration. *Implant Dent.* 2006 Mar;15(1):8-17.
4. Tatum H Jr. Maxillary and sinus implant reconstructions. *Dent Clin North Am* 1986;30:207-29
5. Mahesh L, Schwartz DM, Kumar VR, et al. Sinus augmentation with simultaneous removal of antral polyp. *J Otolaryngol ENT Res.* 2019;11(5):229-233.
6. Kurtzman GM, Mahesh L. Crestal Sinus Elevation for Simultaneous Implant Placement. *Int J Oral Implantol Clin Res*2018;9 (1-3):49-54.
7. L Mahesh, A Agarwal, JC Guirado, P Bali Survival of implants after indirect maxillary sinus elevation procedure: a two years longitudinal study. *J Contemp Dent Pract*, 2019
8. J. Habib, T. Shwaiqi Comparative study of the effect of BlueM active oxygen gel and coe-pack dressing on postoperative surgical depigmentation healing. *The Saudi Dental Journal* 2022;34(4):328-334.

ABOUT THE AUTHORS



Dr. Lanka Mahesh is an implantologist practicing in New Delhi. He is a Fellow and Diplomate of International College of Oral Implantologists (USA) and the Indian Society of Oral Implantologists. He has undergone advanced surgical training at USA and Spain. He has also authored "Practical Guide to Implant Dentistry" published by Quintessence. He has lectured extensively in India and abroad and has numerous publications on implant related topics. He can be reached at drlanka.mahesh@gmail.com.



Dr. Glenn Mascarenhas BDS (Bom), MClintDent (London)

- Graduated from the Government Dental College and Hospital, Bombay (BDS) in 1979.
- Master of Clinical Dentistry (MClintDent) in Prosthodontics with distinction, from King's College London.
- Been in private practice since 1980, with emphasis on Implantology, Prosthetic Dentistry & Cosmetic Dentistry.

Dr. Sagrika Shukla MDS- Periodontics, Private practice, The Specialist Clinic, New Delhi

Dr. Tanvi Paliwal MDS- Endodontics, Private practice, The Specialist Clinic, New Delhi

Dr. Zara Dhawan BDS, Private practice, The Specialist Clinic, New Delhi