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Case Report

Rehabilitation of missing maxillary incisors with two implants and guided bone regeneration

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ABSTRACT

Achieving esthetically satisfactory results after the replacement of missing maxillary incisors is a challenging task that requires meticulous planning on the part of dentists The main aesthetic objectives of an implant-supported prosthesis, from a surgical point of view, are the achievement of a harmonious gingival margin, the maintenance of intact papillae, and the preservation or delineation of a convex contour of the alveolar crest. GBR involves the application of a membrane to exclude non-osteogenic tissues from interfering with bone regeneration that may impede the osseointegration process.The present report describes a case of rehabilitation of missing anterior teeth in the maxillary esthetic zone by means of dental implants using GBR to aid in augmenting the deficient buccal bone.

1. Introduction

Achieving esthetically satisfactory results after the replacement of missing maxillary incisors is a challenging task that requires meticulous planning on the part of dentists. The choice of treatment modalities includes removable dental prostheses, conventional fixed dental prostheses, or an implant-supported prosthesis.[1] Implant-supported prosthesis offers the best retention, support, and aesthetics among these options but requires the presence of an adequate amount of alveolar bone.

The aesthetics of the final prosthesis are affected owing to multiple soft tissue procedures. The main aesthetic objectives of an implant-supported prosthesis, from a surgical point of view, are the achievement of a harmonious gingival margin, the maintenance of intact papillae, and the preservation or delineation of a convex contour of the alveolar crest.[2] The clinician is usually met with tissue or bone deficiencies associated with various anatomic/pathologic conditions in the maxillary anterior region.[3] This jeopardizes the structural, functional, and esthetic outcomes of implant treatment.

Tissue deficiencies often require bone augmentation procedures such as guided bone regeneration (GBR) technique, which uses a simultaneous or staged approach to regenerate adequate volumes of bone which is the primary requisite for implant placement.[4] GBR involves the application of a membrane to exclude non-osteogenic tissues from interfering with bone regeneration that may impede the osseointegration process.The present report describes a case of rehabilitation of missing anterior teeth in the maxillary esthetic zone by means of dental implants using GBR to aid in augmenting the deficient buccal bone.

2. Case Report

A 28-year-old male complained of esthetic concerns due to missing teeth in the maxillary anterior region.

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A history of extraction of maxillary central incisors 9 months ago was elicited. The patient's medical history was unremarkable. After explaining all the available treatment options, the patient chose to opt for dental implants. A cone beam computed tomography scan revealed 12.15 x 4.35 mm of bone available. Hematological investigations were performed and all the parameters were within normal reference intervals. Onlay bone grafting comprising of autograft, xenograft, and GBR using resorbable collagen membrane was planned. The bone defect required a bone augmentation procedure so that the implants could be positioned in the correct orofacial position.

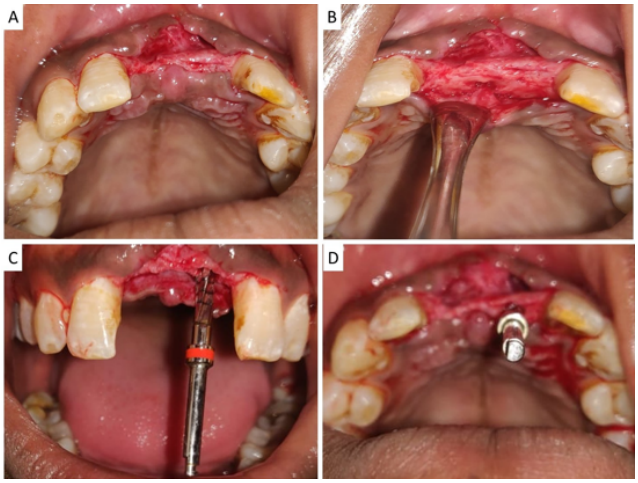

Fig. 1: A) Incision B) Flap reflection; Osteotomy in C) Frontal view and D) Occlusal view

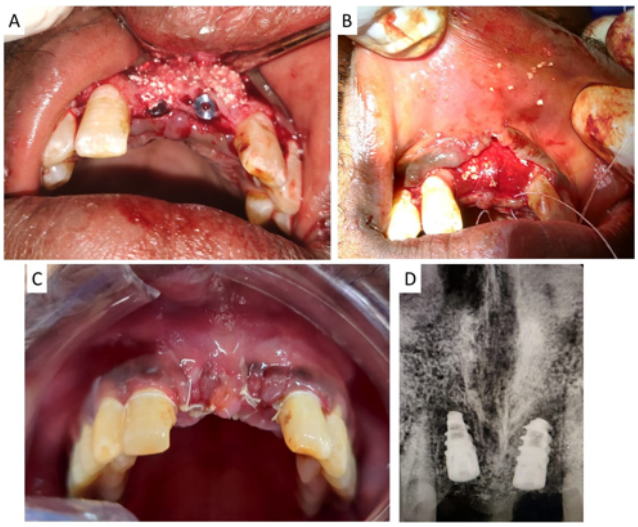

Fig. 2: A) Placement of grafts; B) Stabilization of collagen membrane; C) Suturing after graft placement; and D) Post-operative radiograph

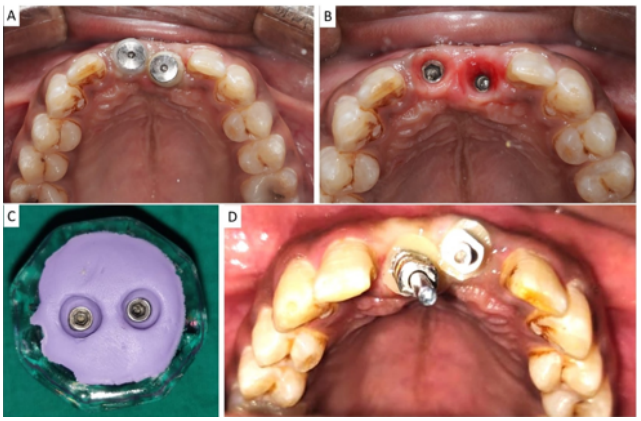

Fig. 3: A) Uncovery surgery; B) Healing of peri-implant tissue C) Replication of emergence profile in putty material; and D) Impression coping placed intraorally

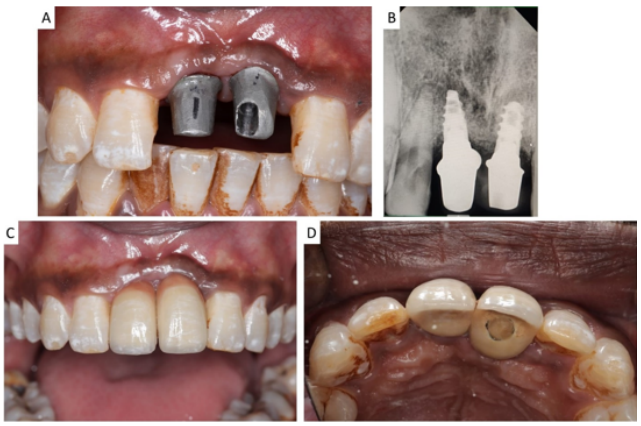

Fig. 4: A) Custom abutments placed on fixture; B) Radiographic verification; Completed Restorations in C) Frontal view and D) Occlusal view

Fig. 5: Comparison of A) Pre-treatment and B) Post-treatment extra-oral front-view photographs

3. Surgical Phase

The patient was prepared for surgery under aseptic conditions and local anesthesia was administered using infiltration technique. A crestal incision was made and a full-thickness flap reflected. Osteotomy was performed using sequential drilling following which two implants (Norris) 3.7 X 10 mm were placed and covered by a cover screw. Autograft was taken from the canine eminence and the anterior nasal spine with the help of a bone scrapper. A combination of Autograft and Xenograft (Ti-Oss) was placed in the anterior defect. Collagen Resorbable membrane was stabilized over the bone graft followed by interrupted suturing with 4-0 Synthetic Resorbable (Vicryl plus). After 5 months, sufficient osseointegration was achieved with uneventful healing of peri-implant tissues. Phase 2 surgery was done and customized healing abutments were placed.

4. Prosthetic Phase

Impression coping was placed intraorally upon which an aesthetic implant impression was made. The emergence profile was replicated in putty material and recorded in composite around the impression coping. An impression was made using addition silicone putty and light body impression material. Jig trial verification was done clinically and radiographically followed by the trial of the abutment. Shade selection was done using Vita 3D Master shade guide. Screw-cement retained prosthesis (SCRP) with right central incisor and Cement retained prosthesis with left central incisor fabricated. Excess cement was removed and occlusion was verified. Oral hygiene instructions were reinforced and recalled for regular follow-ups

5. Discussion

The anterior maxilla is often referred to as the "aesthetic zone."[5] Both the psychological and functional effects of the prostheses enhance rehabilitation and can assure a normal functional and social life ultimately improving the quality of life of the patient.[6] Tooth replacement in the aesthetic zone represents a unique challenge for the clinician; however, achieving optimal aesthetics in this area can be extremely rewarding. Dental implants are commonly used to replace missing teeth, and successful aesthetic results require knowledge of a variety of concepts and techniques.[6]

Satisfactory restoration of aesthetics can be guaranteed only by prosthetic-guided implantology although at times tissue regeneration is often necessary to optimize crestal conditions for correct implant placement. GBR is an established technique that uses barrier membranes to direct the growth of new bone at sites having insufficient bone volumes or dimensions for function and prosthesis placement.[7] The application of barrier membranes to promote bone regeneration was first described by Hurley.

Additionally, recent advances in the composition, alloys, geometry, and technology used for the fabrication and refining of procedures have facilitated improved aesthetic results after the placement of implants in position.[8] In this case, a conventional regenerative multiphase approach was able to assure an aesthetic result.[9] Onstage approaches offer comfortable timing, but they are characterized by more complex surgical procedures aimed at obtaining primary stability, bone regeneration, and adequate soft tissue management.

6. Conclusion

An optimal treatment plan begins with a clear idea of the end result which should fulfill the needs of the patient. Post-extraction crestal bone resorption is common and unavoidable which can lead to significant ridge dimensional changes. Methodically placed dental implants can ensure optimal aesthetic and well as functional results, much crucial for improving the patient's quality of life. This method provided an accurate and aesthetically pleasing alternative for replacing lost hard and soft tissues.

7. Source of Funding

None.

8. Conflict of Interest

None.

References

1. Nair KC. Prosthodontic Treatment preferences in post-independent India: An overview. . *The J Indian Prosthod Soc*. 2013;13(2):68–70.
2. Reddy MS. Achieving gingival esthetics. *J Am Dent Assoc*. 2003;134:295–304.
3. Buser D, Martin W, Belser UC. Optimizing esthetics for implant restorations in the anterior maxilla: anatomic and surgical considerations. *Int J Oral Maxillofac Implants*. 2004;19:43–61.
4. Retzepi MA, Donos N. Guided Bone Regeneration: biological principle and therapeutic applications. *Clin Imp Dent Related Res*. 2010;21(6):567–76.
5. Singh V, Bhagol A, Ashwin V. Controversies in the dental implant treatment planning for anterior maxillary aesthetic zone-A review. *National J Maxillofac Surg*. 2023;14(1):3–8.
6. Yu SJ, Chen P, Zhu GX. Relationship between implantation of missing anterior teeth and oral health-related quality of life. *Qual Life Res*. 2013;22(7):1613–33.
7. Urban IA, Jovanovic SA, Lozada JL. Vertical ridge augmentation using guided bone regeneration (GBR) in three clinical scenarios prior to implant placement: a retrospective study of 35 patients 12 to 72 months after loading. *Int J Oral Maxillofac Imp*. 2009;24(3):502–10.
8. Yao J, Tang H, Gao XL, Mcgrath C, Mattheos N. Patients' expectations from dental implants: a systematic review of the literature. *Health Qual Life Outcomes*. 2014;12:153–9.
9. Magne P, Magne M, Belser UC. Natural and restorative oral esthetics. III. Fixed partial dentures. *J Esthetics Dent*. 1994;6:15–22.

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