

Immediate Implant Placement with Simultaneous Guided Bone Regeneration- A Case Report

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Abstract

Background: Implant placement is combined with simultaneous guided bone regeneration (GBR) procedure to rebuild esthetic facial hard and soft tissue contours. **Aim:** The present case report is on 2 cases wherein immediate implant placement and correction of bony defect encountered during implant placement with guided bone regeneration technique were done. **Methods:** In this case report, 2 patients were treated with immediate implant-46 year old male patient with missing teeth in 11,12 region and 50 year old male patient with missing teeth in the 15,16,17 region. Dental implants were placed in both the cases along with guided bone regeneration. **Results:** At the 3month examination, all 4 implants were successfully integrated in both the patients. **Conclusions:** This case report evaluating the concept of early implant placement demonstrated successful tissue integration for 2 implants. These encouraging results need to be confirmed with 3- and 5-year follow-up examinations.

Keywords: *Immediate Implant, Guided Bone Regeneration, Dental Implant*

1. INTRODUCTION

Dental implants are considered as the first line of treatment in restoring missing teeth now days. The basic biological principles of GBR are to prevent soft tissue invagination protect the bone regenerative compartment during bone healing from the migration of non-desirable cells. Many kinds of barriers membranes have been used to achieve good and predictable clinical results for guided bone regeneration.¹ Advantages of immediate implant placement after the removal of teeth is the preservation of bone at the implant site and positioning of the implant at the same place.² This case report is on correction of bony dehiscence with guided bone regeneration during immediate implant placement in anterior and posterior maxillary alveolar region.

2. CASE REPORTS

CASE 1 – A 46- years old systemically healthy male patient presented with a chief complaint of missing teeth in the upper front teeth region for

past 6 months. Clinical examination revealed a sinus opening in the upper front teeth region (Fig. 1). Clinical examination revealed a narrow faciolingual width of approximately 4 to 5 mm in relation to 11, 12 region. Immediate implant placement was planned in 11 and 12 regions based on the facio-lingual width and the residual bone height. Written informed consent was obtained from the patient. The surgical site was anaesthetized by local infiltration with 2% lignocaine hydrochloride. Incision was given using No. #15 B.P blade (Fig. 2, 3). A full thickness mucoperiosteal flap was elevated (Fig. 4). Narrow facio-lingual width was present in 11, 12 region. Labial bone available was very less. Bony spicule was noted in the labial region. (Fig. 5)

Implant osteotomy was performed in 11, 12 region followed by the placement of two standard diameter tapered self-threaded titanium implants (Fig. 7). The bony defect was managed using deproteinized bovine bone (Bio-oss®) and guided tissue membrane (Healiguide). Bio-oss® graft was packed to cover the exposed implant



surface(Fig. 6).Then the GTR membrane (Healiguide) was adapted over deproteinized bovine bone and was tucked under the labial and lingual flaps. The GBR membrane serves as a barrier and also helps to keep applied bone fillers in place. The IOPAR image showed the presence of dense bone fill on the dehiscence site and also showed an increase in ridge width. (Fig. 9) Healing caps were placed and suturing was done with 4-0 vicryl using simple interrupted suture (Fig. 8). Patient was reviewed the next day and the post-surgical healing being uneventful. The patient is being followed up for prosthesis.

CASE 2- A 50- year old systemically healthy male patient presented with a chief complaint of missing teeth in the upper right back teeth region for past 6 months. Clinical examination revealed a narrow facio-lingual width of approximately 4 to 5 mm in relation to 15 region. Immediate implant placement was planned in 15 and 17 regions based on the facio-lingual width and the residual bone height. Written informed consent was obtained from the patient.The surgical site was anaesthetized by local infiltration with 2% lignocaine hydrochloride. Incision was given using No. #15 B.P blade (Fig. 11, 12) . A full thickness mucoperiosteal flap was elevated. Narrow facio-lingual width was present in 15, 17 region. Buccal bone available was very less. Bony defect was noted in the Buccal region of 15.

Implant osteotomy was performed in 15, 17 region followed by the placement of two standard diameter tapered self-threaded titanium implants (Fig. 13,14) . The bony defect was managed using deproteinized bovine bone (Bio-oss®) and Guided tissue membrane (Healiguide)(Fig. 15,16). Bio-oss® graft was packed to cover the exposed implant surface.Then the GTR membrane (Healiguide) was adapted over deproteinized bovine bone and was tucked under the labial and lingual flaps. The GBR membrane serves

as a barrier and also helps to keep applied bone fillers in place. The reflected flap was approximated with 4-0 vicryl using simple interrupted suture (Fig. 17). Patient was reviewed the next day and after 4 weeks with the postsurgical healing being uneventful. At the end of 3rd month an OPG was taken. The OPG image showed the presence of dense bone fill on the dehiscence site and also showed an increase in ridge width (Fig. 18)

During the second stage, the implant recovery was done with scalpel and healing caps were placed. The patient is being followed up for prosthesis (Fig. 19, 20).

3. DISCUSSION

In order to restore the esthetics, function and health, circumstances which encourage the bone and soft tissue integration using dental implant is essential. All dimensions reduce in edentulous site in i.e. bucco-lingual/ buccopalatal and apicocoronal according to Pietrokovski and Massler, 1967 and Schropp et al., 2003.^{3,4} Bone can be preserved when implants are placed in a fresh extraction socket. Combined approach was used to treat the bony dehiscence during implant placement.

Advantages of immediate implant placement include reduced patient morbidity due to single surgical intervention, time required for treatment is reduced. Implants are also used as pillars of the bone regenerative compartments during guided bone regeneration. In the present case report, resorbable membrane was used to overcome the disadvantage of non-resorbable membrane like need for secondary surgical procedure, risk of tissue damage during secondary surgery and stress, thus it is advisable to replace nonresorbable by bioresorbable membranes.⁵ Supplementary advantages of resorbable membrane include enhanced healing of soft tissue, and the second surgery can be avoided to remove the membrane^{1,6}, bacterial contamination can be circumvented.⁷

Case 1



Figure 1: Pre-Operative Picture



Figure 2: Incision Using No.15 Scalpel



Figure 3: Incision Completed



Figure 4: Intraoperative View After Elevation Of Full Thickness Flap Showing Defect In Labial Region



Figure 5: Intraoperative View

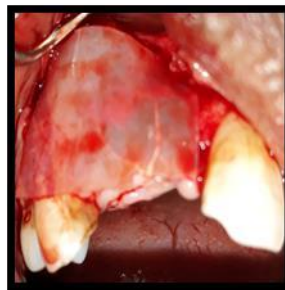


Figure 6: BIO-OSS[®] Has Been Placed To Augment The Bone Buccal To The Implant



Figure 7: Dental Implant Placed



Figure 8: The Reflected Flap Was Repositioned And Healing Abutment Was Placed And Approximated With 40 Vicryl

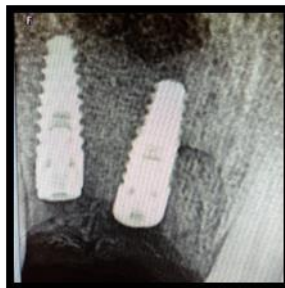


Figure 9: Post-OP IOPAR Showing Osseointegration

Case 2



Figure 10: Pre-OP OPG

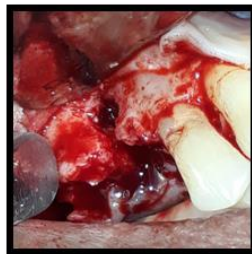


Figure 11: Bony Defect In The Buccal Bone



Figure 12: Intra-Operative View Showing The Defect



Figure 13: Dental Implant Placed IRT 15



Figure 14: Intra-Operative View Showing Dental Implant



Figure 15: GTR Membrane Placed



Figure 16: Bone Graft Placed

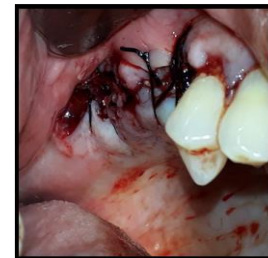


Figure 17: Suturing Done With Vicryl Suture

Figure 18: Post-OP OPG

Figure 19: Healing Abutments Placed IRT 15,17
Figure 20: Suturing Done With Vicryl Suture

Placement IRT 15,17

Factors influencing the success of GBR have multiple variables. Maxillary implants show more bone fill (95%) compared to mandible (78%). Insertion of provisional restoration is more favorable. Immediate and immediate delayed implants showed the best results with 92% bone fill when compared with long-term delayed implants with 80% bone fill; early implant placement timings seem to be preferable due to alveolar ridge preservation, more favorable defect morphology.⁸

High predictable levels of implant survival have been seen in sites treated with GBR versus the untreated ones.⁹ Immediate delayed implants when placed after 4–6 weeks of soft tissue healing phase in extraction sites in esthetic zone, combined with simultaneous GBR, resulted in excellent hard and soft tissue contours.¹⁰

The membrane used for GBR is an important component of the treatment. Various materials and modifications have been used.

Biocompatibility, cell- occlusion properties, integration by the host tissues, clinical manageability, space- making ability, and adequate mechanical and physical properties are the desirable properties of GBR.¹¹

Various graft materials like autogenous, allogeneous, xenograft and alloplastic materials have improved the results of guided bone regeneration techniques and made them more predictable.^{12,13,14} Deproteinized bovine bone (Bio-oss) as used in the present case report have shown to be favorable due to its optimal resorption period, commercial availability, higher survival rate of implants and excellent handling characteristics.^{15,16,17} In this case report implants were placed in the freshly extracted



socket and the bony dehiscence encountered during implant placement was treated with guided bone regeneration technique. The postoperative healing showed optimal bone fill and successful osseointegration in the implant sites. The result of this case report is in concordance with the study done by Palmer et al., 1998 and

Paolantonio et al., 2001.^{18,19,20}

4. CONCLUSION

Simultaneous bone reconstruction and implantation in a freshly extracted socket is a viable option as this approach reduces overall treatment duration and the stress of multiple surgical procedures for the patients.

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