ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 7, Issue, 08, pp.19667-19670, August, 2015

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

IMMEDIATE IMPLANT PLACEMENT WITH GBR "A PROVEN METHOD FOR DEHISCENCE CORRECTION" - A 5 YEARS FOLLOW UP CASE REPORT

***Hameed Fathima, K. and Harish, V. S.**

Department of Dentistry, Sri Muthukumaran Medical College and Research Institute, Chennai - 600069, Tamilnadu, India

ARTICLE INFO

Article History:
Received 27th May, 2015
Received in revised form
03rd June, 2015
Accepted 19th July, 2015
Published online 31st August, 2015

Key words:
Bioresorbable membrane,
Dehiscence,
Deproteinized bovine bone,
Freshly extracted socket and
Guided Bone Regeneration (GBR).

ABSTRACT

Immediate implants are good choice of treatment in order to prevent unfavourable residual alveolar bone changes after extraction in areas where bone quality is favourable for immediate implant placement. Mandibular anterior region predominantly presents with D1 type dense bone but also has greater risk of bony deformation due to various factors like periodontal diseases, aberrant frenal attachments and malocclusion. In most of the cases the labial cortical plate of the mandibular anterior region is either very thin or even lost completely leading to phenomenon called bony dehiscence. The present case report is on implant placement in a freshly extracted socket and correction of bony dehiscence encountered during implant placement with guided bone regeneration technique.

***Citation*:** Hameed Fathima, K. and Harish, V. S. 2015. "Immediate implant placement with GBR "a proven method for dehiscence correction" - A 5 years follow up case report", *International Journal of Current Research*, 7, (8), 19667-19670.

INTRODUCTION

The use of bone augmentation procedures using guided bone regeneration (GBR) has extended the use of endosseous implants to jaw bone areas with insufficient bone volume due to congenital, post-traumatic, or post-surgical defects or as a result of periodontal disease processes. The basic biological principles of GBR are to prevent soft tissue invagination and to protect the bone regenerative compartment during bone healing from the migration of non-desirable cells. To reach good and predictable clinical results, many kinds of barriers membranes have been used for GBR (Zitzmann *et al*., 1997). The use of non-resorbable membranes (titanium mesh, ePTFE - expanded polytetrafluoroethylene membranes etc) is a quite traditional and pure approach of GBR (Lorenzoni *et al*., 1999) (Blanco *et al*., 2005). Resorbable membranes (collagen, polylactic acid, etc) are easier and frequently used nowadays (Schlegel *et al*., 2000) (Llambes *et al*., 2007) (Mihatovic *et al*., 2012). Attempts of regenerating bone for improved anchorage of oral implants may be performed in conjunction with the placement of the implants. Implants placed immediately after the removal of teeth claims advantages like implant positioning and bone preservation at the site of implantation (Werbitt *et al*., 1992) (Hammerle *et al*., 2004) (Chen *et al*., 2004) thus counteracting the adaptive alterations that occur to bone tissue following tooth loss (Denissen *et al*., 1993) (Watzek *et al*., 1995) (Chen *et al*., 2004). This case report is on correction of bony dehiscent with guided bone regeneration during immediate implant placement in anterior mandibular alveolar region.

**Corresponding author: Hameed Fathima, K.*
Department of Dentistry, Sri Muthukumaran Medical College and Research Institute, Chennai - 600069, Tamilnadu, India

Case report

A 56- years old systemically healthy female patient presented with a chief complaint of mobility in the lower front teeth region for past 6 months. Clinical examination revealed presence of grade III mobility (Louis *et al*., 2004) in relation to her lower front teeth region. A tooth supported fixed partial denture in relation to 13,12,11 and 21 was present . Digital orthopantomogram (OPG) evaluation revealed a residual bone height of >13mm in relation to 32, 42 region. Clinical examination revealed a facio-lingual width of approximately 4 to 5 mm in relation to 32 and 42 region but a narrow facio-lingual width of < 3mm in 31, 41 region.

Considering the facio-lingual width and the residual bone height treatment plan of immediate implant placement in 32 and 42 regions was decided upon to reduce overall treatment duration and multiple surgical appointments. Patient was informed about the therapeutic alternatives for replacement of missing teeth using implants .The possible complications of the surgical procedure was also explained and written inform consent was obtained.

Surgical procedure

The surgical site was anaesthetized by local infiltration with 2% lignocaine hydrochloride (1:200000 adrenalin)(Fig - 1a). Atraumatic extraction of 31, 32, 41 and 42 was done. The interdental papilla was relieved using #15 B.P blade. After which a full thickness mucoperiosteal flap was elevated, the surgical site confirmed the dimensions of the residual bone observed on the presurgical radiograph and clinical examination i.e the presence of narrow facio-lingual width in 31,41 region and the presence of sufficient height and facio-lingual width to allow implant placement in 32 and 42 (Fig - 1b). Implant osteotomy was performed in 32 and 42 region (Fig - 1c) followed by the placement of two standard diameter tapered self threaded titanium implants (Hi – Tec Life Care Israel for Life care devices private limited, 202 Jesia building, Jame Jamshed road, Dadar east, Mumbai – 14. Lot No: 030610, 010210).

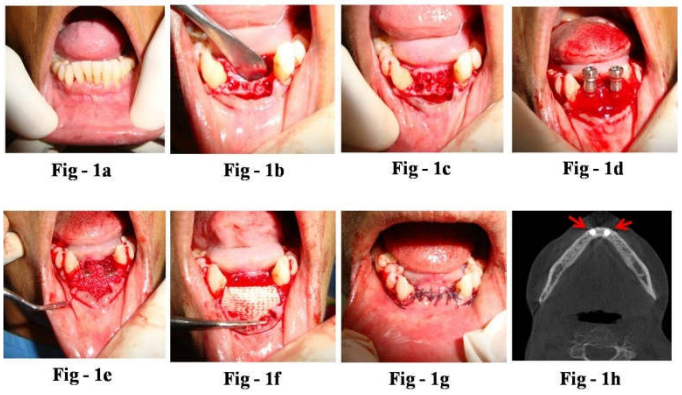

Figure 1. 1a - Preoperative intraoral view of the surgical site. **1b** - Intraoperative view of atraumatically extracted site after elevation of full thickness flap shows a deficient bucco - lingual width in 31 and 41 region. **1c** - Surgical site after implant osteotomy in relation to 32 and 42 region. **1d** - A dehiscence defect was encountered during implant placement on the buccal cortical region in relation to 32 and 42 region. **1e, 1f** - A bioresorbable collagen membrane (Ossix ®) supported by a deproteinized bovine bone mineral (Bio-Oss®) has been placed to augment the bone buccal to the implant, thus integrating the titanium surface. **1g** - The reflected flap was repositioned and approximated with 4-0 vicryl. **1h** - CT taken 4 months after implant placement shows the augmented site with implants

During implants positioning a crestal bony dehiscence was encountered in 32 and 42 region (Fig - 1d). The bony dehiscence was managed using deproteinized bovine bone (Bio-oss®- Geistlich biomaterials batch no: 080307) and bioresorbable collagen membrane (Ossix ® - manufactured by ColBar Life science Ltd. No: 9 Hamenofim St. Herzliya 46725, Israel). Decortication was done with a small round bur to open the marrow cavity and to provoke spontaneous bleeding in the defect area. Bio-oss® graft was hydrated with patient's own blood and was packed to cover the exposed implant surface (Fig - 1e). Then the collagen membrane (Ossix®) was adapted over deproteinized bovine bone and was tucked under the labial and lingual flaps (Fig - 1f). The GBR membrane serves as a barrier and also helps to keep applied bone fillers in place. Periosteal incision was performed in order to promote a tension-free closure of the flaps. The reflected flap was approximated with 4-0 vicryl (Ethicon, Inc., Johnson and Johnson, Somerville, NJ, USA) using simple interrupted suture (Fig - 1g). The patient was placed on augmentin (amoxicillin+clavulinic acid) 625mgs 2tablets/day for 5 days, combiflam (ibuprofen+paracetomol) 2 tablets per day for 5 days. Patient was advised to rinse with chlorhexidine gluconate 0.2% mouth wash twice daily for following 4 weeks.

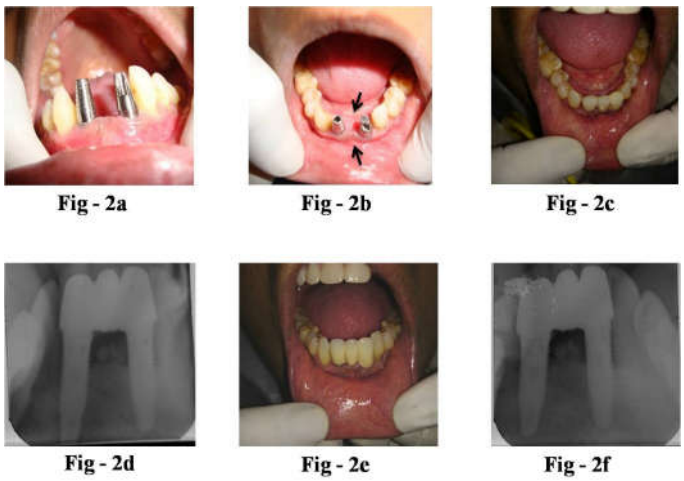

Figure 2. 2a - Implants with prosthetic abutments. **2b** - Arrows indicate the augmented site showing increase in facio - lingual width of alveolar bone. **2c** - fully functional metal ceramic prosthesis. **2d** - 3rd - year post operative radiograph demonstrates normal periimplant bone structures around both implants and no signs of periimplant radiolucencies . **2e** and **2f** - At the 5th-year examination, rehabilitation was functional , the clinical status demonstrates a healthy periimplant mucosa. 5th - year radiograph shows stable bone level for both the implants

Patient was reviewed the next day and after 4 weeks with the post surgical healing being uneventful. Then the patient was placed on periodic recall every 2 months and at the end of 4thmonth a computed tomography (CT) was taken. The CT image showed the presence of dense bone fill on the dehiscent site and also showed an increase in ridge width (Fig - 1h). During the second stage, the implant recovery was done with laser and healing caps were placed and left in place for 4 weeks. 4 weeks following healing cap placement the prosthetic abutment was screwed in with a 40 Ncm torque (Fig - 2a, 2b). A silicon impression was taken involving implant abutment in 32and 42 regions. Following metal ceramic try in, a metal ceramic prosthesis (3 units considering the mesiodistal space available) was cemented and patient was reviewed after a week during which the patient was comfortable and the prosthesis was fully functional (Fig - 2c). Further the patient was reviewed once a year for five years and at the end of 5th year, clinical and radiographic evaluation revealed that both the implants were successfully integrated with no clinical and radiographical bone loss (Fig - 2d,2e,2f).

DISCUSSION

Successful restoration of health, function and aesthetic appearance using dental implants require the establishment of conditions that promote bone and soft tissue integration to the implant. The present case report is on 5 years follow up of immediate implants placed in freshly extracted socket. Immediately after extraction the bony walls of the alveolus present significant resorption, the central part of the socket is partly filled up with woven bone and the extraction site becomes markedly reduced in size. Pietrokovski and Massler, 1967 and Schropp *et al*., 2003 have shown that the edentulous site diminishes in all dimensions i.e. bucco-lingual/ buccopalatal and apico-coronal. At the same time, the soft tissues in the extraction site undergo adaptive changes that clinically may appear as deformations of the jaw. Thus placement of an implant in a fresh extraction socket may allow the preservation of bone tissue of the socket and the surrounding jaw by stimulating bone formation and osseointegration.

The bony dehiscence encountered during implant placement was treated by combined approach (implantation and guided bone regeneration). Combined approach compared to the staged approach has various advantages like decreased patient morbidity due to single surgical intervention, decreased treatment time since regeneration and implantation are performed at the same time. 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 patient morbidity and psychological stress, thus the replacement of non-resorbable by bioresorbable membranes is highly desirable (Christoph *et al*., 2003). Apart from the fact that the surgical intervention for removal of the membrane is omitted by using a resorbable membrane, bioresorbable membranes offer some additional advantages like improved soft tissue healing (Lekovic *et al*., 1997) (Lekovic *et al*., 1998) (Zitzmann *et al*., 1997) the incorporation of the membranes by the host tissues (depending on material properties), and a quick resorption in case of exposure, thus eliminating open microstructures prone to bacterial contamination (Zitzmann *et al*.,1997) (Lorenzoni *et al*., 1999).

Various graft materials like autogenous, allogenous, xenograft and alloplastic materials have improved the results of guided bone regeneration techniques and made them more predictable Misch (2000). Deproteinized bovine bone (Bio - oss ®) as used in the present case report have shown to be favourable due to its optimal resorption period , commercial availability, higher survival rate of implants and excellent handling characteristics (Hising *et al*., 2001). 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 post operative healing showed optimal bone fill and successful ossiointegration 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.

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.

REFERENCES

Blanco, J., Alonso, A., Sanz, M. 2005. Long-term results and survival rate of implants treated with guided bone regeneration: a 5-year case series prospective study. *Clin Oral Implants Res*; 16(3):294-301.

Chen, ST., Wilson, TG. Jr & Hammerle, CH. 2004. Immediate or early placement of implants following tooth extraction: review of biologic basis, clinical procedures, and outcomes. *International Journal of Oral and Maxillofacial Implants*; 19: 12-25.

Christoph HF. Hammerle & Ronald E. Jung, 2000 2003. Bone augmentation by means of barrier membranes. *Periodontology*; Vol. 33: 36-53.

Denissen, HW., Kalk, W., Veldhuis, HA. & Van Waas, MA. 1993. Anatomic consideration for preventive implantation. *International Journal of Oral and Maxillofacial Implants*; 8(2): 191-196.

Hammerle, CH., Chen, ST. & Wilson, TG. Jr. 2004. Consensus statements and recommended clinical procedures regarding the placement of implants in extraction sockets. *International Journal of Oral and Maxillofacial Implants*; 19: 26-28.

Hising, P., Bolin, A. and Branting, 2001. Reconstruction of severely resorbed alveolar crests with dental implants using bovine mineral for augmentation . *International Journal Of Oral and Maxillofacial Implant*; 16: 90 - 97.

Lekovic, V., Kenney, EB., Weinlaender, M. *et al*. 1997. A bone regenerative approach to alveolar ridge maintenance following tooth extraction. Report of 10 cases. *J Periodontol*; 68: 563-570.

Lekovic, V., Camargo, PM., Klokkevold, PR. *et al*. 1998. Preservation of alveolar bone in extraction sockets using bioabsorbable membranes. *J Periodontol*; 69: 1044-1049.

Llambes, F., Silvestre, FJ., Caffesse, R. 2007. Vertical guided bone regeneration with bioabsorbable barriers. *J Periodontol*; 78(10):2036-42.

Lorenzoni, M., Pertl, C., Polansky, R., Wegscheider, W. 1999. Guided bone regeneration with barrier membranes - a clinical and radiographic follow-up study after 24 months. *Clin Oral Implants Res*; 10(1):16-23.

Louis F. Rose, Brian L. Mealey, Robert J. Genco, 2004. Periodontics: Medicine, Surgery and Implants. Elsevier.

Mihatovic, I., Becker, J., Golubovic, V. *et al*. 2012. Influence of two barrier membranes on staged guided bone regeneration and osseointegration of titanium implants in dogs. Part 2: augmentation using bone graft substitutes. *Clin Oral Implants Res*; 23(3):308-15.

Misch, CE. 2000. Contemporary dental implants. 2nd. ed. Sao Paulo: Santos.

Palmer, RM., Smith, BJ., Palmer, PJ. *et al*. 1998. Effect of loading on bone regenerated at implant dehiscence sites in humans. *Clin Oral Implants Res*; 9: 283-291.

Paolantonio, M., Dolci, M., Scarano, A. *et al*. 2001. Immediate Implantation in fresh extraction sockets. A controlled clinical and histological study in man. *J Periodontol*; 72: 1560-1571.

Pietrokovski, J. & Massler, M. 1967. Alveolar ridge resorption following tooth extraction. *Journal of Prosthetic Dentistry*; 17: 21-27.

Schlegel, KA., Sindet – Pedersen, S., Hoepffner, HJ. 2000. Clinical and histological findings in guided bone regeneration (GBR) around titanium dental implants with autogeneous bone chips using a new resorbable membrane. *J Biomed Mater Res*; 53(4):392-9.

Schropp, L., Wenzel, A., Kostopoulos, L. & Karring, T. 2003. Bone healing and soft tissue contour changes following single-tooth extraction: a clinical and radiograhic 12- month prospective study. *International Journal of Periodontics & Restorative Dentistry*; 23: 313-323.

Werbitt, MJ. & Goldberg, PV. 1992. The immediate implant: bone preservation and bone regeneration. *International Journal of Periodontics and Restorative Dentistry*; 12: 206-217.

Watzek, G., Haider, R., Mensdorff-Pouilly, N. & Haas, R. 1995. Immediate and delayed implantation for complete restoration of the jaw following extraction of all residual teeth: A retrospective study comparing different types of serial immediate implantation. *International Journal of Periodontics and Restorative Dentistry*; 12: 206-217.

Zitzmann, NU., Naef, R., Scharer, P. 1997. Resorbable versus nonresorbable membranes in combination with Bio-Oss for guided bone regeneration. *Int J Oral Maxillofac Implants*; 12: 844-852.

****