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CASE REPORT

BONE REGENERATION: A CASE REPORT

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ABSTRACT

The main goal of periodontal therapy is to restore lost supporting tissue and re-establish a healthy maintainable environment. Guided Bone Regeneration (GBR) is a reconstructive procedure of alveolar ridge using membranes. This procedure is indicated when there is no sufficient bone for implantation, or in the case of optimal implant installation for esthetic or functional needs guided bone regeneration treatments for implant are used before implant placement or performed simultaneously with implantation (combined approach). GBR techniques have been used for socket preservation and for vertical and horizontal ridge augmentation for deficient ridge due to traumatic extraction, accidental loss of teeth, at the time of implant placement due to bony defects like fenestration, dehiscence and also to treat peri-implantitis defects. Many bone substitutes are available like autogenous bone graft, allograft, alloplast, xenograft for bone regeneration.

INTRODUCTION

The main objective of GBR is bone fill of osseous defect and establish a healthy periodontal environment Dahlin *et al.* (1989) [1] were the first to provide evidence to support the effectiveness of GBR in promoting peri-implant bone formation, following application of e-PTFE membranes around exposed threads of implants inserted in rabbit tibiae.. Guided bone regeneration treatments for implant are used before implant placement for socket preservation [2] and ridge augmentation for deficient ridge due to traumatic extraction, accidental loss of teeth, at the time of implant placement due to bony defects like fenestration, dehiscence and also to treat peri-implantitis defects. Principal of GBR is exclusion of undesirable cells from the wound environment to enable cells from bone tissue to proliferate into the coagulum filled space under the barrier membrane.

Indications

1. Fenestration
2. Dehiscence
3. Implant thread exposure
4. In case of immediate implant placement

Following criteria was considered for implant placement with simultaneous GBR

The clinician can use the following criteria to decision making process:

- Implant must be placed in a correct three-dimensional position from both a functional and an esthetic point of view.
- It is a must to achieve primary implant stability in this specific position.
- The peri-implant bone defect must have a favorable defect morphology to allow zone regeneration of the defect area.

It also depends upon general and local factors:

General factors:

- Age
- Health status of the patient compromised by health problems such as diabetes and osteoporosis, hypertension.
- Medications such as anticoagulation therapy or bisphosphonates.

Local factors

1. The ratio between the surface area of exposed bone and the defect volume to be regenerated
2. The structure of the bone wall in the defect area
3. Bone filler.

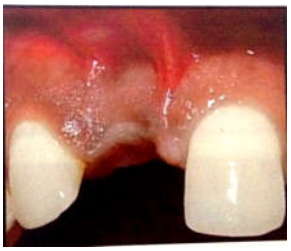

Fig.1 Missing maxillary right central incisor.

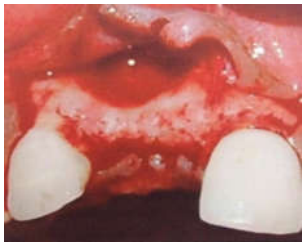

Fig.2 Mucoperiosteal flap reflected

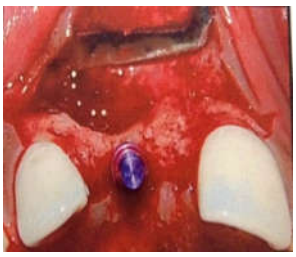

Fig.3 Paralleling pin

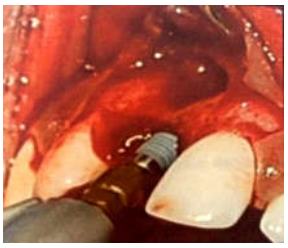

Fig.4 Implant placement

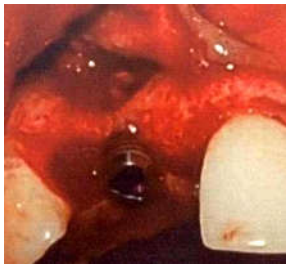

Fig.5 Threads exposure

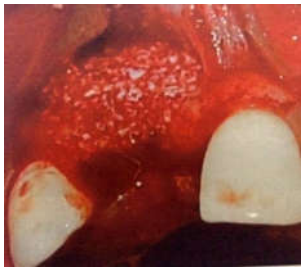

Fig.6 Autogenous bone graft

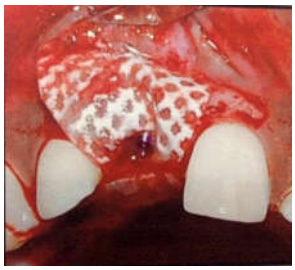

Fig.7 Cross linked collagen membrane

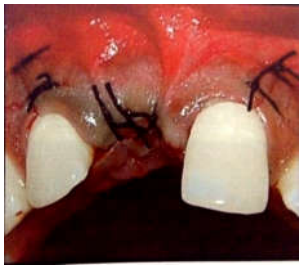

Fig.8 Suturing

Clinical case report

A 30 year old female in good general health presented for treatment in the Dept. of Periodontology, Bharati Vidyapeeth Dental College and Hospital, Pune. The patient was secllected from OPD for treatment of missing 11.(Fig.2). She was in good health with no contraindications to periodontal surgery. After thorough explanation of surgical treatment, the an informed consent signed by the patient.

Surgical principles followed

- premedication
- Premedication includes a rinse of the oral cavity with chlorhexidine digluconate (0.2%) for 1 minute.
- Patient be covered with sterile drapes.
- All surgical instruments must be sterilized properly, physiodispensor allowing drilling speeds between 15 and 2,000 rpm and irrigation with chilled sterile saline is highly recommended.
- Disinfection of the perioral skin with betadine prior to surgery.

Surgical Technique

- Patient was anaesthetized.
- Paracrestal incision was given followed by sulcular incisions mesial and distal of the surgical site to gain access for impant and graft placement. As full thickness muco-periosteal flap was reflected, defect seen in the region of 11 (Fig.3).
- After initial osteotomy with 2mm drill, paralleling pin was placed to check implant parallelism with adjacent teeth. (Fig.4).And the site was prepared for placement of implant sized 3.8/11mm.
- Implant was placed in correct position.(Fig.5). 4 threads of implant were exposed after implant placement (Fig.6).
- First layer of autogenous graft [3,4]from the symphyseal region was placed over threads which ere exposed. After which second layer of low substitution filler material, Bio-oss was placed over autogenous graft. (Fig.7) Bone grafts be wetted with patient's own blood from surgical site rather than saturated with sterile water or saline, which may hinder vascular infiltration of the saturated particles.
- Cross-linked collagen membrane was placed over graft material. [5](Fig.8).
- Suturing (Fig.9) was carried out so as to achieve a primary closure.

DISCUSSION

Bone grafts and bone substitute materials play important roles in GBR procedures with the indications ranging from minor implant fenestration defects to bridging major continuity defects in the facial skeleton. Auto grafts are the only grafting materials with well-documented osteoinductive potential. The immediate availability of the bone-stimulating molecules harbored in autografts is increased by particulating the graft and thereby enhancing the surface area. However, resistance toward graft resorption is reduced when the size of the autogenous particles decreases. Unpredictable resorption, donor site morbidity, and limited quantities available are the main drawbacks related to the use of autografts in bone augmentation procedures. As a result of the drawbacks of autografts, much effort has been invested in the search for suitable alternatives. Like autografts, allogratts contain osteoinductive moleecules. However, it is debatable whether the concentration and activity of these molecules is of clinical significance. In addition, allografts have the same drawbacks as autografts except that they are available in abundant quantities. Factors influencing the success of GBR Factors that have been suggested to influence the outcome of GBR include patient factors(e.g., smoking), excessive swelling, passive flap tension, cortical penetration, defect morphology, defect length and defect angle, membrane fixation, and materials used.[6]
In this case results are still awaiting. Patient has been put up on regular follow-up.

CONCLUSION

Numerous case reports and controlled clinical trials indicate that autogenous bone grafts can be used successfully in periodontal therapy. The role of regenerative materials has become quite significant and has become an indispensable part of the periodontist kit. What we need to introspect is the critical evaluation of each available material prior to usage with a thorough knowledge of the composition and procedural

requirements of the material. Autogenous bone play important role in regeneration process. The findings of these cases illustrate the potential of attaining a predictable regeneration of the bone. Future research needs to focus on predictability of these materials in the long-term success of periodontal therapy.

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