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CASE REPORT

FENESTRATION COVERAGE WITH PLATELET RICH FIBRIN IN A SINGLE STAGE IMPLANT PLACEMENT – A CASE REPORT

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ABSTRACT

Immediate temporization after a single stage implant placement is fairly a recent concept, which allows the maintenance of soft tissue contours. Improvements in implant design and development of new implant surfaces have resulted in increased use of this procedure. The presence of osseous defects like fenestration and dehiscence can hamper the surgical outcome and need to be corrected. The combined use of bone grafts and growth factors contained in PRF may enhance the bone density as suggested by various clinical trials. In the present study the advantage of the properties of bone graft and PRF membrane have been used to treat the fenestration defect in a single stage implant procedure.

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INTRODUCTION

Implantology has revolutionized the practice of dentistry and has become a widely used technique. The original concept by Branemark of osseointegration advocated a 2-stage surgical procedure. After the placement of implant, it was covered by the mucosa and the site was left to heal. A second surgical intervention after a few months is done involving the placement of an abutment, which penetrates the soft tissue (Branemark, 1985 and Albrektsson, 1981). However, the waiting period for the osseointegration (4-6 months) and the fabrication of prosthesis after a two stage surgical procedure were the main disadvantages. Immediate temporization is fairly a recent concept, which allows the maintenance of soft tissue contours. Moreover, with a 1-piece implant design, manipulation of the peri-implant soft tissue after initial healing can be avoided. The implant can be provided with a provisional restoration at placement, allowing for the mucosal epithelium and the connective tissue adhesion to form coronal to the alveolar crest (Drago, 2005). It further saves the patients and clinicians time and money, and is becoming a state of art procedure for implant placement (Chen, 2004).

Improvements in implant design and development of new implant surfaces have resulted in increased use of this procedure. In the present case report, one – piece immediate loading implant system with the built on abutment has been used.

Case report

A 30 years old male patient was referred to the OPD with a chief complaint of missing right central incisor in the maxillary jaw (Fig 1). The patient had a history of trauma during his childhood and the tooth had been missing ever since. Patient had no significant past relevant medical or dental history and was not taking any medications. After completion of phase I therapy, a thorough clinical examination, laboratory investigation, radiological examination and assessment of study model were performed. Patient was prescribed premedication prior to surgical procedure.

Armamentarium

Two HI-TEC TRX-OP one piece with abutment, non-submerged tapered at apical 5mm, sandblasted and acid-etched surface implants were used. The length of the implant was 10mm and diameter was 2.8mm. Since bucco – lingual

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diameter was compromised it was decided to place implants with the smallest diameter. Also the mesio-distal measurement was such that two implants had to be placed. Surgical twist drills of diameter 2 mm and 2.2 mm were used in sequence to prepare the site. Paralleling pin was used to obtain parallel preparation and to guide the direction of drilling preparation. A hand piece with internal irrigation was used for bone drilling. A fixture insertion tool (XOT, large or small) was used manually and with Hex Ratchet for final insertion of the implants in its proper position.



Fig. 1. Pre-operative view

Surgical technique

The surgical procedure was carried out under local anesthesia and absolute asepsis and infection control was maintained. Crestal incisions and sulcular incisions were given on the adjacent teeth and a full thickness mucoperiosteal flap was raised buccally and palatally to the level of mucogingival junction, exposing the underlying ridge of the implant site (Fig.2). A surgical guide was used for the precise placement of the pilot drill. A pilot drill of 2 mm diameter at a drill speed of 800 rpm was used with copious saline irrigation. The drill was indexed with markings to correspond to the implants length. Subsequently, increasing diameter of twist drills was used according to the length and diameter of implants. The implants were placed in the recipient site (Fig. 3). A torque driver set at 35Ncm which was used to evaluate primary stability of implant.



Fig. 2. Full thickness flap reflected

After the implants were placed an area of fenestration was seen on the buccal cortical bone (which was comparatively thin) (Fig.4). It was decided to treat the defect by placing bone graft with PRF (Platelet rich fibrin) membrane. 10 ml peripheral venous blood was withdrawn to prepare a PRF membrane.



Fig. 3. Single stage implants placed

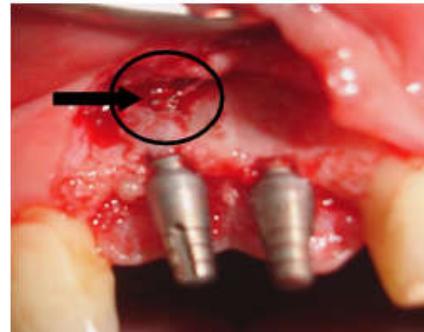


Fig. 4. Fenestration defect

Bone graft (BioGraft® - HA^{NANO}) was placed in the defect and covered with the membrane (Fig.5). The membrane was extended coronally to cover the slight marginal dehiscence. The flaps were positioned back and sutured using direct loop sutures (4 – 0 proline). Intraoral periapical radiograph was taken immediately after surgery (Fig.6).

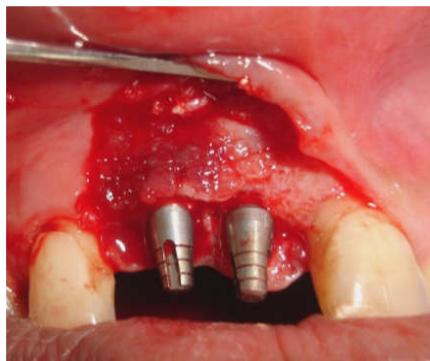


Fig. 5. Bone graft and PRF membrane placed



Fig. 6. Post-operative radiograph

Placement of temporary crown was postponed for one week for better contour and gingival outcome. A temporary acrylic crown was then provided and occlusal adjustment was done to make sure that no load is applied on the implants. Patient was prescribed amoxicillin 500 mg (3 times daily) and Aceclofenac 100 mg in combination with Paracetamol 500 mg (2 times daily) for 5 days post-operatively. Permanent prosthesis was given after 4 months (Fig. 7).



Fig. 7. Final prosthesis

DISCUSSION

The presence of an edentulous area or a missing tooth especially in the esthetic zone may affect the social life of the patient. It can lead to a sense of low self – esteem. The implant-supported prosthesis can overcome these problems and has proved to be a noteworthy addition to restorative dentistry (Chen, 2004). In our case a one-piece design with no separate abutment screw was used. The advantages of this design included increased strength, elimination of the risk of abutment screw loosening, and reduced crestal bone loss due to non-existence of microgap between the abutment and implant.⁵ Since the site was in esthetic zone immediate temporization was considered. In the present case, the area of fenestration present on the buccal cortical bone was covered with a PRF membrane after filling the defect with bone graft. Hydroxyapatite granules (150 to 700 micron) were used in this case. Use of bone grafts along with barrier membrane has been utilized in treatment of fenestration and dehiscence defects. PRF is a second generation platelet concentrate, developed by Choukroun et al in 2001 (Dohan, 2006 and Choukroun, 2001). The preparation is simple and inexpensive and it can be used directly as a clot or after compression as a strong membrane. Unlike other platelet concentrates, this technique does not require any anticoagulants, bovine thrombin or any other gelling agents. Potential clinical indications of PRF are numerous, few including improvement of soft tissue healing and bone graft protection and remodeling (Choukroun, 2006; Choukroun, 2006). It further helps in graft stabilization and improves the handling properties of graft materials, involving a bit of tissue engineering.

Conclusion

Placement of dental implants in the esthetic zone is a technique-sensitive procedure with little room for error.

To achieve a successful esthetic result and good patient satisfaction, implant placement in the esthetic zone demands a thorough understanding of anatomic, biologic, surgical, and prosthetic principles. The one-piece implant design provides an attractive and easy alternative to two-piece implants for treatment with immediate provisional restorations. Implant survival rate with beneficial marginal bone levels can be attained with this type of implant design. The presence of osseous defects like fenestration and dehiscence can hamper the surgical outcome and thus should be effectively corrected. The combined use of bone grafts and growth factors contained in PRF may enhance the bone density as suggested by various clinical trials.

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