Conventional and Modified Papilla Preservation Flap (PPF) using Bone Graft and Platelet Rich Fibrin (PRF): an Attempt of Management of Soft Tissues in an Esthetic Zone

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ABSTRACT

Introduction: Esthetics is of prime concern in today's sophisticated and modernised society. Esthetics is the science of beauty and encompasses almost every field of dentistry. An ideal periodontal therapy must necessarily consider esthetic appearance, which means an effort to maintain gingival marginal anatomy and as much height of papilla as possible along the course of the periodontal therapy. Often, non-surgical approach is encouraged for maxillary anterior dentition. However, there are situations in which surgical therapy is unavoidable.

Case Report: This case report describes Conventional as well as Modified Papilla Preservation Flap Techniques along with bone graft and a second generation Platelet concentrate PRF to treat anterior maxillary dentition with periodontal bone defect.

Conclusion: Papilla preservation flap technique not only results in an esthetically pleasing architecture but also provides a better approach for interproximal regenerative procedures.

Keywords: Conventional Papilla Preservation, Modified Papilla Preservation, Platelet Rich Fibrin, Bone graft.

INTRODUCTION

Periodontics is that speciality of dentistry which encompasses the prevention, diagnosis and treatment of diseases of the supporting and surrounding tissues of the teeth or their substitutes and the maintenance of the health, function and esthetics of these structures and tissues.[1]

"Esthetics" is the science of beauty, which is the particular detail of an animate or inanimate object that makes it appealing to the eye. Esthetic or cosmetic dentistry strives to merge function and beauty with the values and individual needs of every patient. A common finding after performing definitive pocket elimination therapy, especially in the maxillary anterior region, is the unesthetic appearance of gingiva due to a greater crown and root exposure marked by an increased spacing in the interdental region giving it a picket fence appearance.[2]

To avoid the occurrence of unesthetic maxillary anterior gingival architecture, our focus should be on preserving the interdental papillae thus making it esthetically pleasing.

The surgical approach of preserving the interdental papilla was introduced by Takei et al. in 1985 who named the technique as Papilla Preservation Flap Technique (PPF). PPF ensured optimal interdental coverage, facilitated easier placement as well as retention of the bone grafts and prevented displacement of the graft material.[3] The pre-requisite for preserving the interdental tissue is the presence of wider embrasures between the teeth and the absence of tight contacts.[3]

Conventional Papilla Preservation Flap (PPF)

Facially, sulcular incisions are given around each tooth without involving the interdental papilla. Palatally/lingually sulcular incisions are given continuous with a semi-lunar incision across the interdental papilla. From the line angles, papillary incision line is greater than 5mm from the gingival margin. During surgery the gingiva especially in the interdental region should be firm and free of inflammation.

Modified Papilla Preservation Flap (MPPF)

In the year 1988, Checchi et al. modified the conventional technique. The technique reportedly states that it is better to use a horizontal incision than a semilunar incision in the interproximal region, given in the opposite side of the bone defect as it facilitates the preservation of the regenerated area from the oral environment.[4] The term Modified Papilla Preservation Flap was given by Cortellini et al. in 1995.[5]

CASE REPORT

A 35-year old male patient reported to the Department of

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Periodontics with the chief complaint of bleeding gums since two years. Intraoral examination revealed periodontal pockets in relation to maxillary teeth with pocket probing depth of more than 9mm which bled upon probing.

The maxillary anterior teeth exhibited Grade I Miller's recession, interdental spacing between teeth #11, #21, #22 & #23. Keratinized tissue at the site of interest was adequate. The radiographs revealed vertical bone defect in relation with maxillary anterior teeth.

Based on the clinical and radiographic data, patient was diagnosed to have chronic periodontitis.

Subsequent scaling and root planing was achieved and patient was motivated for oral hygiene care. The areas were re-assessed for gingival health, pocket probing depths and gingival bleeding during supportive periodontal care, which indicated a need for surgical intervention with predictable esthetic value.

Conventional PPF was planned with teeth #11 & #21 and modified with #21 & 22, #22 & #23.The patient gave his consent to the treatment protocol after the form of therapy was explained to him.

Adequate anesthesia using 2% lignocaine with a concentration of 1:100,000 epinephrine was obtained. The extent of bone defect was probed as the extension of the osseous defect in relation to the palatal aspect of the interdental papilla determines the position of semilunar incision. The facial surface was prepared with a sulcular incision around teeth #11 and #21 with no incisions made through the interdental papilla.

The palatal flap design consisted of sulcular incisions along the palatal aspect of the teeth in relation to the central incisors with a semilunar incision made across the interdental papilla in relation to the teeth 11 and 21.This semilunar incision was made such that it dipped apically from the line angles of the tooth so that the papillary incision line was at least 5 mm from the gingival margin which allowed the interdental tissue to be dissected from the palatal aspect facilitating intact elevation with the facial flap.

Papilla incorporated in facial flap

After the incisions, flaps were reflected and the interdental papilla was then freed from the underlying hard tissue using interproximal knife. This detached papilla was then pushed through the interdental space with a periosteal elevator in a way that the entire papilla would be incorporated in the flap. The reflected flap was scraped on the inner side and trimmed off to eliminate pocket epithelium. Thorough debridement was done with the help of curettes followed by meticulous scaling and root planing.

Preparation of PRF

5 ml of venous blood was drawn in a test tube without an anticoagulant, and centrifuged immediately. It was centrifuged for 10 minutes at 3000 rpm.

Figure-1: Preoperative view

Figure-2: Papilla incorporated in facial flap

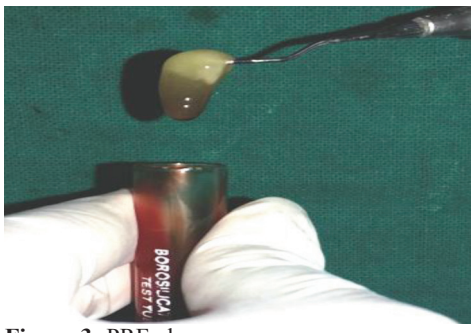

Figure-3: PRF plug

Figure-4: PRF with bone graft

Figure-5: Post operative view at 1 month

PRF with bone graft

The flaps raised by conventional method were sutured by interrupted sutures and the facial flap containing the papilla was brought to contact well with the incision line on the palatal aspect and a direct suture was placed.

A surgical dressing was placed as it reduces the chances of flap displacement by mastication, accidental tooth brushing or interferences by tongue action.

Patient was instructed to rinse with 0.2%
chlorhexidene twice a day for two weeks.

Periodontal dressing and sutures were removed one week postoperatively. The healing was uneventful. Patient was advised to initiate mechanical oral hygiene from the second post operative week. Supportive periodontal therapy was provided every month and oral hygiene instructions were reinforced at that time. The patient was followed up post operatively for one year duration.

DISCUSSION

The modern periodontal paradigm is directed towards the establishment of physiological form of gingiva thereby restoring its optimal function and esthetics. Conventional papilla preservation flap method preserves the interdental papilla by incorporating the entire papilla in one of the flaps and also guarantees a result very similar to a situation preceding surgery.

The present case utilized papilla preservation flap method in the anterior maxillary teeth 11 and 21 to obtain reduction of the periodontal pockets with an esthetically pleasing result. During the course of supportive periodontal care, the gingiva exhibited health with normal pyramidal shaped interdental papilla and no gingival bleeding was observed.

Modifications in the conventional papilla preservation flap technique can be appropriately used with coronally displaced flap along with bone graft and barrier membrane.[6] Modified papilla preservation flap is indicated in teeth having narrow interdental spaces.[7] These flap methods require expertise as they are technique sensitive which makes them time consuming and are indicated wherein regenerative therapy is anticipated.

In the present case, Platelet Rich Fibrin (PRF) plug minced together with bone graft (HA+TCPA) was used in relation to 11. PRF is a second generation Platelet concentrate developed by Dr. Joseph Choukroun in France in the year 2001.[8] PRF has additional advantage over the first generation Platelet Rich Plasma (PRP) as it is strictly autologous since it does not require addition of an anticoagulant or bovine thrombin thus does not induce antigenicity. It has been used extensively in combination with bone graft materials for periodontal regeneration, ridge augmentation, sinus lift procedures for implant placement and for coverage of recession defects in the form of a membrane.

CONCLUSION

Although a non-surgical approach is advocated for maxillary anterior region but there are conditions when surgical approach cannot be avoided. A surgical approach that splits the papilla certainly contributes to shrinkage and decrease in the height of interdental papilla leading to exposure of the interproximal embrasures.

In such cases, Papilla Preservation Technique provides a better approach for optimal interproximal regeneration in an esthetically pleasing manner.

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