REVIEW ARTICLE

Papilla Preservation Flap: Revisited


Abstract

An ideal periodontal therapy should establish a state of periodontal health evidenced by absence of inflammation, periodontal pockets and a potential for the patient to maintain the health in addition to function and esthetics. Surgical approach to treat periodontal defects with maxillary anterior dentition in an esthetically pleasing manner is possible only when papillary integrity is preserved. This case report describes Papilla sparing flap method to treat anterior maxillary dentition affected with periodontitis. The modifications in Papilla preservation flap designs are also discussed with its applicability.


Key words: Papilla preservation techniques, Simplified papilla preservation flap, Modified Papilla preservation flap, esthetics

Introduction

One of the most distressing aspects of periodontal surgery is the unesthetic maxillary anterior gingival architecture after definitive pocket elimination therapy. Greater crown and root exposure and increase in the interdental spacing results in a picket fence appearance which is highly unacceptable[1].

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. A surgical approach that splits the papilla certainly contribute to shrinkage and decrease in the height of interdental papilla leading to exposure of the interproximal embrasures.

This led to the development of a flap technique which intended to spare the papilla instead of splitting it. Probably the first report of a Papilla Preservation procedure was by Kromer in 1956 which was designed to retain osseous implants[2]. App in 1973, reported a similar technique and termed it as Intact Papilla Flap,
which retained the interdental gingival in the buccal flap [3]. Evian et al preserved the interdental gingival in the facial flap, which exposed osseous margins on the labial and the interproximal zone, while the palatal tissues were reflected separately [4]. Genon and Bender in 1984 also reported a similar technique indicated for esthetic purposes. Takei et al in 1985 introduced a detailed description of the surgical approach reported earlier by Genon and named the technique as Papilla Preservation Flap, which ensured optimal interproximal coverage and facilitated placement and retention of bone grafts which prevented exfoliation of the graft material[5].

However, the presence of ample embrasure between the teeth with the absence of a tight contact point, is a pre-requisite to retain the interdental tissue[2].

**Papilla Preservation Flap (PPF)**

This method uses sulcular incisions (Fig.1a) around each tooth with no incision being made through the interdental papilla facially, but the lingual/palatal flap involves a sulcular incision (fig.1b) along each tooth with a semilunar incision (fig.1c) made across each interdental papilla that dips apically from the line angles of the tooth so that the papillary incision line is at least 5 mm from the gingival margin allowing the interdental tissues to be dissected from the lingual or palatal aspect so that it can be elevated (fig.1d) intact with the facial flap [5]. PPF has witnessed some modifications in the papilla sparing incisions, either to achieve interproximal tissue coverage over barrier membranes placed coronal to the alveolar crest, to facilitate coronal positioning of the interdental tissues and/or to facilitate placement of implants.

![Papilla Preservation Flap](image)

The first modification of PPF was reported by Checchi et al in 1988, where in horizontal incision over the interproximal area, in the opposite side of the bone defect was deemed ideal as it allowed protection of the regenerated area from the oral environment[6].

Cortellini et al in 1995, proposed a modification in the PPF and named it as Modified Papilla preservation flap[7].

**Modified Papilla Preservation flap (MPPF)**

Primary intrasulcular incision (Fig.2a) (buccal and interproximal) involving two teeth neighboring the defect is made. A horizontal incision (fig.2b) is traced in the buccal gingiva of the interdental space at the base of the papilla. This horizontal incision is then connected (fig.2c) with the primary incision in the most apical portion of the buccal gingival of the neighboring teeth and a full thickness buccal flap (fig.2d) was elevated to the level of the buccal alveolar crest. Buccal and interproximal primary incision is continued intrasurally in the interproximal space and extended to the palatal aspect (Fig.2e).

![Modified Papilla Preservation Flap](image)

A buccal horizontal incision (Fig. 2f) is performed in the interproximal supracrestal connective tissue, coronal to the bone crest, to dissect the papilla. The papilla is then elevated (Fig. 2g) towards palatal aspect. Following extension of the palatal incision, a full thickness palatal flap including the interdental papilla was elevated to fully expose the defect. The tissue thickness of papilla is reduced to permit coronal advancement of the flap. Vertical releasing incision divergent in corono-apical direction extending in to the alveolar mucosa can be placed in the interproximal spaces neighboring the defect if coronal advancement of the flap is desired[7].
Papillary preservation flap and its modified flap design, both required a wide interdental space as a pre-requisite to bring about appreciable functional and esthetic value. To apply esthetic value to teeth having narrow interproximal zone, Cortellini et al in 1999 proposed the Simplified Papilla preservation flap technique[8].

The Simplified Papilla preservation flap (SPPF)

An oblique incision (Fig 3a) is made across the defect associated papilla from the gingival margin at the buccal line angle of the involved tooth to reach the mid interproximal portion of the papilla under the contact point of the adjacent tooth. The oblique incision continues intrasulcularly in the buccal aspect of the teeth neighbouring the defect and extended to partially dissect the papillae of the adjacent interdental spaces allowing the elevation of a buccal flap (Fig 3b) with 2-3 mm exposure of alveolar bone.

A buccolingual horizontal incision (Fig 3c) at the base of papilla close to the interproximal crest is made. Intrasulcular incisions are continued in the palatal aspects of the two teeth neighbouring the defect and extended into the interdental papilla of adjacent interdental spaces, following which a full thickness palatal flap (Fig 3d) including the interdental papilla is elevated[8].

Both the modifications of PPF, require utilization of horizontal and/or vertical internal mattress sutures which relieve the tension in the flap, permit coronal positioning of the flap and aid in passive closure of the interdental tissues.

Case Report of Papilla preservation flap technique (PPF) -

A 38 year old, male patient, in good general health with no known allergies and good oral hygiene, reported of bleeding gums which he had observed for two years. Intraoral examination revealed periodontal pockets in relation to maxillary teeth with pocket probing depth of more than 8mm (Fig.4a, 4b) which bled upon probing. The maxillary anterior teeth exhibited Grade I Miller’s recession, interdental spacing between teeth 11 and 21. Adequate keratinized tissue and papillary frenel attachment was exhibited in this area. The radiographs revealed horizontal bone defects in relation with maxillary anterior teeth. Based on the clinical and radiographic data, patient was diagnosed to have chronic periodontitis.

Fig.4a, 4b Preoperative photograph showing presence of periodontal pockets

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. Papilla preservation flap surgery was the ideal choice in relation to the two central incisor teeth, as these teeth presented wide interdental spacing with a broad interproximal
gingival zone which is a pre-requisite for Papilla preservation flap technique. Conventional flap was planned with teeth 12,13,14 and 22,23,24. 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 1:20,000 epinephrine was obtained. The extent of bone defect was probed as the extension of the osseous defect in relation to the palatal or lingual aspect of the interdental papilla determines the position of semilunar incision. The facial surface was prepared with a sulcular incision (Fig.4c) around teeth 11 and 21 with no incisions made through the interdental papilla.

Once the incisions were completed, the flaps were reflected and the interdental papilla was freed from the underlying hard tissue using interproximal knife. The detached interdental tissue was pushed through the embrasures with a periosteal elevator such that the flap could be easily reflected with an intact papilla. The underside of the reflected flap (Fig. 4f) was scraped and trimmed to remove pocket epithelium and granulation tissue. The thickness of the interdental tissue maintained adequate blood supply, minimized chances of post operative gingival recession. The defect was debrided with curettes and thorough scaling and root planing (Fig. 4g, 4h, 4i) was performed. The flaps raised by conventional method were sutured by interrupted sutures (Fig. 4j) 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 (Fig.4k). A surgical dressing (Fig.4l) 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% chlorhexidine 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 postoperative week. Supportive periodontal therapy was provided every month and oral hygiene instructions were reinforced at that time. The patient was followed up postoperatively for one year duration.

Discussion

The modern periodontal paradigm is predicated on papillary preservation maintainable on gingival esthetics [1]. Therefore, while
considering treatment in the esthetic zone, a flap method that preserves the anatomy of the gingival margin with optimal function and esthetics is desirable. The papilla plays a fundamental role in aesthetic and phonetic functionalities and also serves as a biological barrier to protect the attachment apparatus [9]. The papilla preservation flap incorporates the entire papilla in one of the flaps. Papillary preservation flap method not only preserves the interdental papilla but also focusses on the preservation of the soft tissues guaranteeing a result very similar to a situation preceeding surgery.

The present case utilized papillary preservation flap method in the anterior maxillary dentition with teeth 11 and 21 to obtain reduction of the periodontal pockets with an esthetically pleasing result. Post operative, it was noted that soft tissue craters did not develop in the area where papilla was spared but small dip was observed in the tips of papilla where conventional flap incisions were made. During the course of supportive periodontal care, the gingiva exhibited health with normal pyramidal shaped interdental papilla and no gingival bleeding. The pockets were probed at 6 months which revealed significant reduction in the pocket depth (residual probing depth 3mm), and with very minimal gingival recession and improved soft tissue contour (Fig.4m).

Variations in the papillary preservation flap designs can be appropriately used when coronal advancement of flap over bone graft and barrier membrane placements is considered. Simplified papilla preservation flap can offer better esthetic results with teeth exhibiting narrow interdental spaces even in posterior teeth [8]. Though these flap methods are technique sensitive, time consuming and have specific clinical indications, their applicability should be utilized when regenerative therapy is considered.

**Conclusion**

It is important to respect papillary integrity during periodontal surgical therapy. Papilla preservation flap method not only maintains esthetic value but is a better approach for interproximal regenerative procedures. Earlier methods proposed it for wide interdental spaces in the anterior and pre-molar region. However, Simplified papilla preservation flap method can also render applicability to narrow and /or posterior interdental spaces achieving both functional and esthetic value.

**References**

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