

Papilla Preservation Flap: A Novel Surgical Approach

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Abstract

The periodontal therapy includes nonsurgical periodontal therapy, surgical periodontal therapy, and the correction mucogingival problems. Non-surgical approach is most common for maxillary anterior dentition. However, in specific cases, surgical therapy is the treatment of choice, for obtaining favorable outcome. The aim of surgical periodontal therapy is to eliminate pocket and to create a stable, easily maintainable state, and to promote periodontal regeneration. Periodontal surgical therapy used in periodontal defects with maxillary anterior dentition in an esthetic manner is possible only when integrity of the papilla is preserved. This article discusses the different papilla preservation flap designs.

Key words: Conventional papilla preservation, Esthetics, Modified papilla preservation, Simplified papilla preservation, Whale's tail technique

INTRODUCTION

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 and recession. 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 maintain osseous implants.^[1] App, in 1973, reported a similar technique and termed it as intact papilla flap, which retained the interdental gingival in the buccal flap.^[2] Evian *et al.* modified this technique to preserve the anterior esthetics after flap surgery.^[3] 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.^[4]

There are various surgical approaches available to obtain primary closure of flap and to preserve interdental tissue.

- Conventional papilla preservation technique^[5] (Takei *et al.* 1985)
- Modified papilla preservation^[6] (Cortellini *et al.* 1995)
- Simplified papilla preservation flap^[7] (Cortellini *et al.* 1999)
- Whale's tail technique (Bianchi and Bassetti 2009).

CONVENTIONAL PAPILLA PRESERVATION FLAP

Takei *et al.*, in 1985, introduced conventional papilla preservation technique. It incorporates the entire papilla in one of the flaps by means of crevicular interdental incisions to detach the connective tissue attachment and a horizontal incision at the base of the papilla, leaving it connected to one of the flaps.

- Step 1 – Intrasulcular incision at the facial and proximal aspects of the teeth
- Step 2 – Intrasulcular and semilunar incisions at lingual/palatal aspect of teeth

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Month of Submission : 04-2022
Month of Peer Review : 05-2022
Month of Acceptance : 05-2022
Month of Publishing : 06-2022

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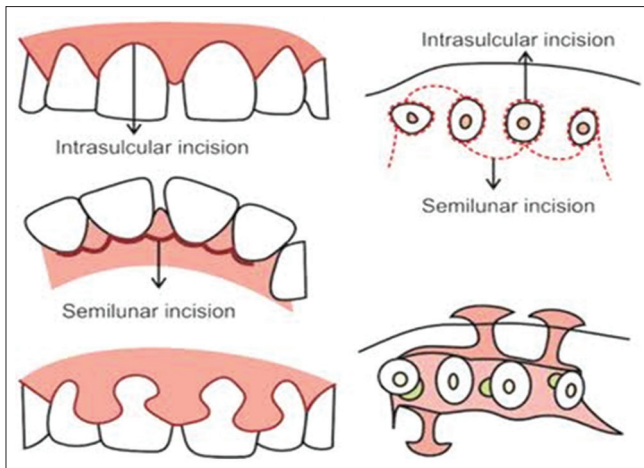


Figure 1: Conventional papilla preservation flap

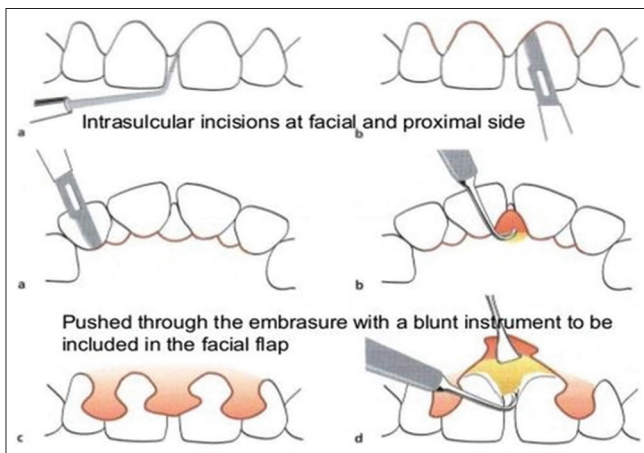


Figure 2: Conventional papilla preservation flap

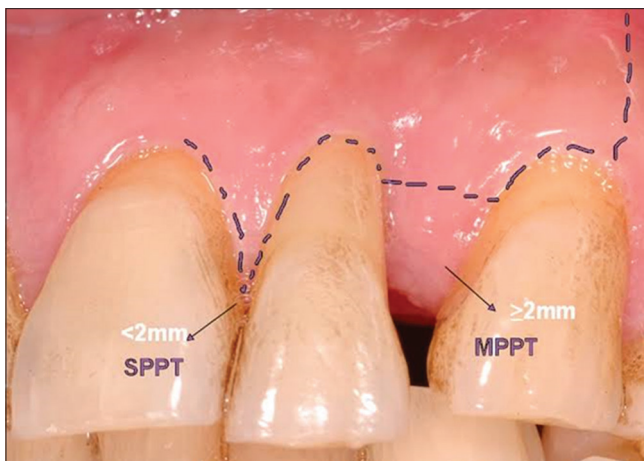


Figure 3: Simplified papilla preservation flap and modified papilla preservation flap

- Step 3 – Semilunar incision should dip apically by 5 mm from line angles of teeth
- Step 4 – A curette/interproximal knife is used to free the interdental papilla from underlying tissue

and a blunt instrument is used to push the detached interdental tissue through embrasure

- Step 5 – A full thickness flap is reflected by periosteal elevator on facial and lingual/palatal surfaces.

Cortellini *et al.*, in 1995, proposed a modification in the papilla preservation flap and named it as modified papilla preservation flap.^[6]

MODIFIED PAPILLA PRESERVATION FLAP

- Step 1 – Primary buccal and interproximal intrasulcular primary incision involving two teeth neighboring the defect is made
- Step 2 – A horizontal incision with slight internal bevel is given on buccal gingiva of interdental space at base of papilla
- Step 3 – Connect the horizontal incision with mesiodistal primary intrasulcular incision
- Step 4 – A full-thickness flap is elevated on buccal aspect
- Step 5 – The buccal and interproximal incisions are continued intrasulcular in interproximal space to reach palatal line angles on palatal aspect
- Step 6 – Dissect the papilla and push on palatal with blunt instrument
- Step 7 – A full thickness palatal flap with interdental papilla is then elevated
- Step 8 – To allow coronal positioning of buccal flap, a vertical releasing incision in coronal directions extending in to the alveolar mucosa can be placed in the interproximal spaces neighboring the defect.

SUTURING OF FLAP IS CARRIED OUT AS

- A horizontal internal mattress suture is placed between base of palatal papilla and the buccal flap coronal to MGJ
- A vertical internal mattress suture is placed between the buccal aspect of interproximal papilla and the most coronal portion of buccal flap
- The vertical releasing incisions are sutured with a apicocoronal suture
- Interproximal sutures are placed to close mesial and distal extension of the flaps, to obtain coronal positioning of the buccal flap and primary closure of interdental space over the membrane.

Wide interdental spaces as a pre-requisite to bring about appreciable functional and esthetic value, for both the papilla preservation flap and its modified flap design. To apply esthetic value to teeth having narrow interdental

zone, Cortellini *et al.*, in 1999, proposed the simplified papilla preservation flap technique.^[8]

SIMPLIFIED PAPILLA PRESERVATION FLAP

A horizontal incision is replaced by an oblique incision and placed on the buccal aspect of the interdental papilla, and the papilla is elevated toward the palatal aspect.

- Step 1 – An oblique incision is placed along 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 of the adjacent tooth
- Step 2 – The oblique incision is continued intrasulcularly in the buccal aspect of the teeth adjacent the defect and extended to partially dissect the papilla of the adjacent interdental spaces
- Step 3 – This allows the elevation of a buccal flap with 2–3 mm exposure of alveolar bone.^[8]

THE “WHALE’S TAIL” TECHNIQUE

Bianchi and Bassetti,^[9] in 2009, introduced a surgical technique to preserve interdental tissue in guided tissue regeneration known as a “whale’s tail” technique. It was used for the treatment of wide intrabony defects in the esthetic zone involving the elevation of a large flap from the buccal to the palatal side to allow accessibility as well as visibility of the intrabony defect maintaining interproximal tissue to recreate a functional attachment with esthetic results.^[9] It was possible to elevate a large flap from buccal to palatal, which allowed the preservation of a large amount of soft tissue and resulted in good primary closure. Besides, positioning of incisions away from the defect area and placement of sutures distant from the regenerated defects decreased the chances of bacterial colonization of the biomaterials, which is often responsible for regenerative failures.

HEALING AFTER PAPILLA PRESERVATION FLAP

- Immediate response is clot formation
- At edge of flap numerous capillaries are seen

- 1–3 days after surgery, space between flap, and tooth surface and bone appears to be reduced and the epithelial cells along with border of the flap start migrating
- By 1 week after surgery, epithelial cells have migrated and established an attachment to root surface by means of hemidesmosomes
- The blood clot is replaced by granulation tissue proliferating from gingival connective tissue, alveolar bone, and periodontal ligament
- By 2nd week, collagen fibers begin to appear parallel to root surface
- By end of 1 month, the epithelial attachment is well formed and gingival crevice is also well epithelialised [Figures 1-3].

CONCLUSION

Papilla preservation flap surgery technique maintains esthetic value and a better approach for interproximal regenerative procedures.

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How to cite this article: Bhalerao A, Mali A. Papilla Preservation Flap: A Novel Surgical Approach. *Int J Sci Stud* 2022;10(3):15-17.

Source of Support: Nil, **Conflicts of Interest:** None declared.