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Effectiveness of Subepithelial Connective Tissue Graft (SCTG) With Coronally Advanced Flap (CAF) For Papilla Reconstruction.

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## Abstract

The presence or absence of the interdental papilla is a topic of great esthetic concern. Several surgical and nonsurgical techniques have been proposed to rebuild lost papilla. The aim of the present study is to evaluate effectiveness of subepithelial connective tissue graft (SCTG) with coronally advanced flap for papilla reconstruction. Five patients with the age range of 20-40 years who were conscious for their esthetics with total or partial loss of interdental papilla were selected for the study. The papilla reconstruction was done using subepithelial connective tissue graft. Mean gain of 2.43 mm in papilla height was observed and mean reduction in horizontal distance at gingival margin was 1.5 mm at 3 months after surgery. Therefore the data from the present study suggest that the use of subepithelial connective tissue graft along with coronally advanced flap can successfully regenerate the loss interdental papilla.

**Keywords:** Papilla reconstruction. Connective tissue graft, Interdental Papilla, Coronally advanced flap, Interdental papilla.

# Introduction

One of the major aesthetic challenges in periodontal plastic surgery is related to the ability of rebuilding lost papillae in the maxillary anterior segment. Interdental papillae can be lost as a result of several distinct clinical situations. The most common reason in the adult population is loss of periodontal support. Others are abnormal tooth shape, improper contours of prosthetic restorations and traumatic oral hygiene procedures.

Several surgical and non-surgical techniques have been proposed to rebuild lost papilla. The nonsurgical approaches (using orthodontic, prosthetic and restorative procedures) modify the interproximal space, thereby reducing interproximal spaces. Han and Takei (1996)<sup>[1]</sup> described a technique consisting of a pedicle graft using a semilunar incision and coronal displacement of the entire gingivopapillary unit. Azzi et al (1998)<sup>[2]</sup> demonstrated a surgical technique using a connective tissue graft under the buccal and palatal flaps and reported consistently good result thereby improving the esthetics. Insufficient blood supply is the major limiting factor in all surgical papilla reconstructive techniques. Therefore, techniques using pedicle and/or advanced flaps nearly show better results than those with free grafts. Therefore the aim of the present study is to evaluate effectiveness of subepithelial connective tissue graft (SCTG) with coronally advanced flap for papilla reconstruction.

#### **Method and Material**

Five patients with the age range of 20-40 years who were conscious for their esthetics with total or partial loss of interdental papilla, width of keratinized gingiva greater than 2 mm, Vertical distance greater than or equal to 6 mm were included in the study. However patients with unacceptable oral hygiene, periodontal pocket or attachment loss, smokers, interdental spacing, pregnant females, inadequate endodontic or restorative treatment were excluded from the study.

# **Clinical Measurements**

The clinical measurements including vertical distance from the tip of the papilla to the alveolar crest, base of the contact area to the alveolar crest and tip of the papilla to the base of the contact point, interproximal width of papilla and width of keratinized gingiva (WKG) were recorded at baseline and at 6 months.

## **Surgical Procedure**

#### Preparation of the recipient site

After the administration of local anesthesia, a splitthickness semilunar incision was performed 2 mm coronal to the mucogingival junction, extending from the mesial aspect of the central incisor to the distal aspect of the lateral incisor. Intrasulcular incisions were then made with a No. 15C blade around the necks of these teeth, extending from the buccal face to the palate. The existing papilla was fully preserved. To release the gingivopapillary unit from the bone, a split-thickness flap was initiated using an orban knife through the semilunar incision on the buccal face, extending toward the palate. After the incisions, the soft tissue was completely released from the root and bone, and the whole flap became mobile, allowing for the coronal displacement of the papillary unit.

## Harvesting of connective tissue graft

Connective tissue graft was harvested by a 'trap door approach' from the palate. An incision was made in the palate like the shape of papillae, 2-3 mm apical to gingival margin in the region of maxillary canine and first molar. Perpendicular incisions were made to establish width of graft. Primary flap was reflected to expose the underlying connective tissue. The connective tissue was removed with a periosteal elevator. The graft was then placed on a sterile gauze pad and irrigated with saline. It was then modified as per the required dimensions after removal of excess fatty and glandular tissue. The primary flap at the donor site was returned to its original position and was sutured with 3-0 / 4-0 Mersilk sutures to obtain primary closure by using interrupted suturing technique or crossed horizontal suspension suturing technique. Primary tension free wound closure was achieved to avoid post-operative contamination.

#### Placement of Graft at the recipient site

To maintain the whole unit coronally, the dead space was filled with the connective tissue graft. It was introduced and stabilized in place using a suture. The alveolar mucosa was then dissected to promote its coronal advancement without any tension over the papillary structure. Suturing of the semilunar incision was initiated, and primary closure was obtained with healing by first intention.

#### **Post-operative care**

Immediately after surgery, periodontal dressing (Coe-Pak, TM, GC, America Inc, ALSIP, IL, USA) was placed on surgical site. NSAID's Tab. Ibugesic Plus (Ibuprofen 200 mg + Paracetamol 400 mg), t.i.d and systemic antibiotic Cap. Mox (Amoxicillin 500 mg), t.i.d was prescribed for 5 days during post surgical period. Patients were instructed not to brush the teeth for first 30 days after surgery at the treated sites. All patients were instructed to rinse with 0.2% chlorhexidine gluconate (Hexidine- ICPA) twice daily, for 2 weeks. They were instructed not to disturb the pack and to avoid undue trauma to the treated sites.

#### Result

A total of 5 patients requiring surgical procedure for the corrections of total or partial lack of interdental papilla between the maxillary central incisors were selected for the study. During the course of the study, wound healing was uneventful, and there were no postoperative complications in any patients. None of the selected patients dropped out before the termination of the study, and all the patients were satisfied with the results. All the selected patients had class I papillary height at baseline.



# Discussion

One of the most undesirable effects of any periodontal surgical technique involving interproximal areas is total or partial loss of papillary tissue which is considered to be a major esthetic concern. Loss of interdental papilla may create esthetic impairments, create phonetic problems, and allow unnecessary food impaction.

Mean gain of 2.43 mm in papilla height was observed and mean reduction in horizontal distance at gingival margin was 1.5 mm at 3 months after surgery. Tarnow et al (1992)<sup>[3]</sup> reported that the distance from the bone crest to the contact point was positively related to the presence of an interdental papilla. According to Tarnow et al (1992)<sup>[3]</sup> 5 mm or less- the entire papilla was always present, 6 to 7 mm- papilla was present 56% of the time,7mm or more-papilla present only 27% of the time or less. Nemcovsky

(2001)<sup>[4]</sup> evaluated advanced papillary flap combined with gingival graft in 10 patients of which 8 patients showed complete construction where as no changes were observed in 2 patients. Carnio (2004)<sup>[5]</sup> achieved long term stability using an interposed subepithelial connective tissue graft for papilla reconstruction. Palathingal (2011)<sup>[6]</sup> achieved complete papilla reconstruction in a 20 year old woman.

# Conclusion

Following conclusions were drawn from the study:

1. The use of subepithelial connective tissue graft along with coronally advanced flap can successfully regenerate the loss interdental papilla.

2. To be successful, the surgical technique must involve the maintenance of the integrity of the interproximal tissue.

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# **Legends Figure**





Fig1: Pre Operative Measurements

Fig 2: Semilunar Incision Given



Fig3: Flap Displaced Coronally



Fig 5: Harvested Connective tissue graft



Fig 4: Incision placed on palate



Fig 6: Connective tissue graft placed on the

recipient bed



Fig 7: Periodontal Pack Placed



Fig 8: Post Operative View

