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Research paper

The role of subepithelial connective tissue graft for reconstruction of interdental papilla: Clinical study

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ABSTRACT

Background: The ideal goal of periodontal therapy is regeneration of the lost periodontium. However regeneration of the lost interdental papilla has been elusive. Therefore the ability of rebuilding lost papillae in the maxillary segment has become one of the major challenges in periodontal plastic surgery. Objectives of the study: To evaluate the success and predictability of surgical technique using a sub epithelial connective tissue graft interposed in a coronally displaced flap to reconstruct the lost interdental papillae.
Methods: The purpose of this study is to evaluate the success and predictability of a surgical technique using a subepithelial connective tissue graft from the palate with coronally displaced flap to regenerate the lost interdental papilla in 11 systemically healthy patients.
Results: Post treatment follow up show statistically significant results from baseline to 3months and 6 months.
Conclusion: The present study attempted a single surgical procedure to reconstruct the lost interdental papilla using subepithelial connective tissue graft interposed in coronally displaced flap in 11 patients with Tarnow's class-II papillary recessions. At the end of 6 months it was found that the sites demonstrated significantly superior results as determined by percentage of reduction in the area of the black triangle both clinically (60.26%) and on the model (54.29%).
Clinical Implications: Although complete regeneration of interdental papilla was not achieved, the results of this study demonstrate that a predictable and an esthetically pleasing surgical outcome can be achieved in one attempt for class II papillary recessions.

Introduction

Esthetics has become a major concern in periodontal therapy. A key to an aesthetically pleasant smile is proper management of the soft tissues around natural teeth or implants. Aesthetic soft-tissue contours are described by a harmoniously scalloped gingival line, the avoidance of an abrupt change in clinical crown length between adjacent teeth, a convex buccal mucosa of sufficient thickness and a distinct interdental papilla [1].

The interdental space is a physical space between two adjacent teeth. Its form and volume are determined by the morphology of the teeth. Morphologically, the papillae had been described first in 1959 by Cohen [2]. Prior to this time, interdental papilla was considered as a gingival trait having a

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pyramidal shape and functioning to deflect food from the interproximal areas. Now it is clear that the physiology of the papilla is more complex. It not only acts as a biological barrier in protecting the periodontal structures, but also plays a critical role in the aesthetics. Hence, it is very important to respect papillary integrity during all dental procedures and to minimize traumatizing it, inducing its loss [3].

An interdental papilla is deemed complete when it fills the interdental space completely up to the contact point. There may be several reasons for loss of papilla height and establishment of "black triangles" between teeth. The most common cause in the adult individual is loss of periodontal support due to plaque associated lesions. However, the presence of naturally occurring midline diastema, abnormal tooth shape, improper contours of prosthetic restorations, orthodontic tooth movement and periodontal procedures may negatively influence the outline of the interdental papilla [4]. These conditions may create esthetic impairment, phonetic problems and food impaction leading to further loss of tissues [5].

The treatment for restoration of interdental papilla include both nonsurgical and surgical approaches. The nonsurgical approaches advocate orthodontic, restorative or prosthetic interventions. The surgical techniques aim to preserve, recontour or reconstruct the interdental papilla. Surgical techniques that have been used include the pedicle graft procedure [4]and an envelope type flap prepared for coverage of a connective tissue graft [5]. However, the results of these techniques have largely been unpredictable and are documented as case studies. No systematic reviews are available on the long term stability of surgically regained interdental papillae [5].

Subepithelial connective tissue graft has been extensively and effectively used for predictable root coverage, increasing the amount of keratinised gingiva, for treatment of furcation involvement and ridge augmentation procedures. The success of the subepithelial connective tissue graft has been attributed to the double blood supply, closer color blend of graft to the adjacent tissue [6] and absence of keloid healing. Minimal morbidity at the palatal donor site further adds to its efficacy. Therefore these advantages of subepithelial connective graft could be utilised for the reconstruction of interdental papilla [7,8].

Objectives of the study

To evaluate the success and predictability of a surgical technique using a sub-epithelial connective tissue graft interposed in a coronally displaced flap to reconstruct the lost interdental papillae with the following objectives.

1. To harmonize the pink and white elements at interdental region.
2. To increase the width of keratinized gingiva.
3. To assess the stability of the interdental tissue gained at the end of 6 months.

Materials and methods

The purpose of this study was to evaluate the success and predictability of a surgical technique using a subepithelial connective tissue graft from the palate with coronally displaced flap to regenerate the lost interdental papilla. Eleven systemically healthy patients attending the Department of Periodontics, The Oxford Dental College, Hospital and Research centre, Bangalore, fulfilling the following criteria were selected and recruited for the study. The ethics committee of the institute approved the study protocol. Written informed consent was obtained after explanation of the surgical procedure and the likely post-treatment outcomes.

Inclusion criteria

1. Patients aged above 18years.
2. Distance from the contact point to alveolar bone crest $\geq$ 5 mm.
3. Patients with Class II and Class III papillary recession, according to Nordland and Tarnow's classification systems.

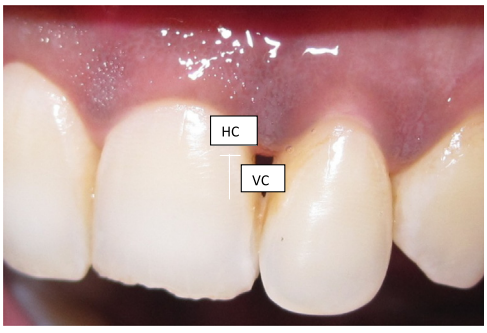
Exclusion criteria

1. Spacing between the teeth.
2. Abnormal tooth shape.
3. Severe crowding of teeth.
4. Patients with active periodontal disease.
5. Patients with systemic diseases such as diabetes mellitus, hypertension or conditions that alters the outcome of periodontal therapy.
6. Pregnant and lactating women.
7. Tobacco users.
8. Thin palatal mucosa and presence of tori.

Pre-operative preparation

Prior to the surgical procedure all the patients underwent Phase I therapy. Strict home care protocol was explained to the patients.

Routine blood investigations were carried out to determine the surgical fitness of the patients. Periapical radiographs for the region affected with papillary loss were



Photograph 1 – Vertical component - VC, Horizontal component – HC.