

MICROSURGICAL TECHNIQUE FOR PAPILLA RECONSTRUCTION: A CASE REPORT

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Abstract

In recent years, esthetic demand in dentistry has increased rapidly, which is governed by an enhanced awareness towards gingival esthetics and facial beauty. Smile plays a significant role for the betterment of esthetics which exhibit health and self-confidence. Quintessential smile entails an ideal relationship between the teeth, periodontal complex and surrounding oral tissues. Any disharmonious relation between the following components results in unaesthetic smile. Loss of interdental papillae also known as Black Triangle is a consequence of periodontal disease because of inflammation or trauma. Traditional surgical treatment leads to unpredictable outcome because of limited working space and blood supply to the area being treated. The application of microsurgical armamentarium such as surgical microscopes and microsurgical instruments with microsuturing provides a new edge for predictable esthetic outcomes. Present paper describes a microsurgical technique for reconstruction of the lost interdental papillae.

Key Words: Beagle's Technique, Interdental Papilla, Microsurgery, Papilla Reconstruction.

Introduction

The reconstruction of lost interdental papillae remains a challenge. Predictable results are hindered by the small dimensions of the interproximal space and the pattern of vascular supply to this end organ/papilla. The swelling of soft tissue during healing as the result of the presence of inflammatory exudates and formation of new capillaries can further jeopardize the positive outcome of papilla reconstruction procedures. Many surgical techniques to augment soft tissue around dental implants^{1, 2} and teeth^{3,4} have been described to date.

Function of Interdental papilla is to acts as a barrier which helps in the protection of periodontium and plays a vital role in esthetics. Loss of papilla occurs due to destruction of interdental bone occurs as the result of migration of epithelium apically.⁵

In 1982, Nordland and Tarnow proposed a classification system for loss of papillary height based on anatomic landmarks.⁶ (Figure 1).

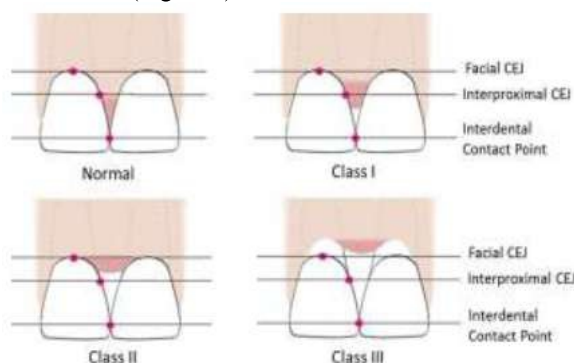


Figure 1: Classification system for loss of papillary height

- The interdental contact point
- The apical extent of the facial CEJ
- The coronal extent of the proximal CEJ

Normal: the interdental papilla occupies the entire embrasure space apical to the interdental contact point/area.

Class I: the tip of the interdental papilla is located between the interdental contact point and the level of the CEJ on the proximal surface of the tooth.

Class II: the tip of the interdental papilla is located at or apical to the level of the CEJ on the proximal surface of the tooth but coronal to the level of the CEJ mid-buccally.

Class III: the tip of the interdental papilla is located at or apical to the level of the CEJ mid-buccally.

Various non-surgical and surgical techniques are being practiced over the past few years for the reconstruction of the interdental papilla. Non-surgical techniques include restorative/ prosthetic restorations, orthodontic approach and the repetitive practice of curettage of the interdental papilla.⁷ Surgical techniques consist of various pedicle and free connective tissue grafts.⁸

This paper describes a microsurgical procedure for papilla reconstruction. The surgery is accomplished without the use of releasing incisions, thereby increasing the likelihood of donor tissue survival and minimizing tissue trauma, excessive bleeding, scarring, and pain. As the vascular supply remains intact, tissue survival is optimized.

Case Report

A healthy 36-year-old, non smoking female reported to the Department of Periodontology, TeerthankerMahaveer Dental College & Research Centre, Moradabad complaining about her loss of gums between upper front teeth and was concerned about esthetics. Clinical examination revealed, there was a loss of papilla between two maxillary central incisors (Figure 2). Detailed medical and dental history was recorded. After thorough clinical and radiological examination, diagnosis of Class II loss of papilla was made. Initial therapy was performed and after a month evaluation was done. Reconstruction of

interdental papilla between maxillary central incisors was planned using “Beagle technique”.



Figure 2: Loss of interdental papilla between 11 and 21

Surgical Procedure

Informed consent was obtained from the patient. Blood investigations were done. Area was anesthetized using xylocaine with epinephrine (1:50,000). Root preparation was accomplished with root planing and conditioning with citric acid. Incision was given at the base of palatal papilla and then reflected labially as shown in Figure 3. Procedure was performed using 3.5x magnification of surgical microscope.



Figure 3: Palatal Papilla reflected labially

The papilla was then trimmed, folded and sutured with 6-0 (Vicryl™, Ethicon, Johnson and Johnson) microsuture for the creation of new papilla to obliterate the open embrasure completely between 11 and 21 (Figure 4). The patient was prescribed analgesics for 3 days and 0.2% chlorhexidine mouthwash for 15 days.



Figure 4: MicroSuturing with 6-0 sutures

Sutures were removed after two weeks. Healing was found to be satisfactory with minimal pain. Patient was reviewed for 6 months. Successful reconstruction of interdental papilla was achieved with

significant filling of embrasure between 11 and 21 (Figure 5).



Figure 5: Post-operative healing & reconstruction of interdental papilla of 11 and 21

Mechanical cleaning was forbidden on operated site for first 2 weeks and advised gentle brushing later.

Discussion

Esthetic procedures have become an important part of periodontal plastic surgery. Various factors result in black triangles or loss of papilla between teeth such as, traumatic oral hygiene procedures interdentally, inflammatory periodontal disease because of plaque accumulation, past surgical procedure, improper interproximal contact because of variation in size and location, shape of central incisor, inappropriate prosthetic restorations or crowns, removal of soft tissue following extraction and post-orthodontic treatment.⁷

Due to the presence of restricted and minimal space in the interdental region, none of the grafting procedure provides predictable result due to limited blood supply.⁹ One of the most detrimental effects of surgical technique which involves interproximal region leading to gingival recession and subsequently loss of papillary tissue.¹⁰

A human observational study correlated the presence or absence of the interproximal papilla with the vertical distance between the contact point and the crest of alveolar bone. When the tissue fills the embrasure completely, the papilla is considered to be present. When the space is visible apical to the contact point, the papilla is deemed missing. When the vertical distance from the contact point to the crest of bone is 5 mm or less, the papilla is present almost 100% of the time. When the distance is 6mm or more, the papilla is usually missing.¹¹ Midline reconstruction of lost interdental papilla, which are independent of the periodontal biotype, can be treated by other treatment protocols which includes interdisciplinary approach like Periodontic- Orthodontic, Restorative procedures for the management of periodontal patients having aesthetic problems.¹²

Reconstruction of lost papilla have been tried and tested by variety of surgical methods without long term follow up. Benefit of the Beagle's technique¹³ is minimally invasive approach without involving second surgical site. Additionally, this procedure is less time-consuming and is a simpler technique to perform. Successful surgical

procedure necessitates the maintenance of the integrity of the inter proximal tissue. Predictability of any kind of surgical technique for papilla reconstruction depends upon the underlying bone height and, the distance between the contact point and alveolar crest.¹⁴ However, if connective tissue graft or bone graft alone or combined are used, optimum results could be achieved. Use of magnification improves the operator's skill and allows better vision under shadow less light especially while operating on smaller area of oral cavity. Microsuturing with 6-0 sutures is ideal for manipulation of tiny piece of tissue like a interdental papilla.

Conclusion

Present case report deals with the successful reconstruction of papilla by minimally invasive microsurgical technique improving smile and overall esthetics. Utilization of microsurgical instruments with microsutures under magnification greatly impacts on optimization of results.

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