

Enhancing Esthetic Outcome through Interdisciplinary Approach: A Case Report

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Abstract

Loss of interdental papilla and gingival recession are one of the major concerns for esthetic zone. To restore sustainable periodontal health and the normal esthetic appearance of a healthy 17 year old girl with generalized chronic periodontitis, a combined esthetic surgery and orthodontic technique were used. This interdisciplinary approach resulted in stable periodontium and an esthetically pleasing appearance of anterior region.

KEYWORDS: Papilla recreation, Gingival Recession , Esthetics.

Introduction

Satisfaction of patient's needs is the most critical element in any successful dental practice. Cosmetic dentistry is a major clinical and research focus including a growing emphasis on aesthetic procedure in periodontal practice. Abnormal tooth alignment is an important cause of gingival deformities that require corrective surgery and also an important factor in determining the outcome of the treatment. All things being equal, well-formed teeth in ideal inter-arch and intra-arch alignment are better candidates for periodontal surgery than those which are malposed, drifted, or crowded¹. Combining the field of Periodontics and Orthodontics in procedures such as papilla recreation and soft tissue root coverage can provide better esthetic outcome for the patients.

This paper is the initial report of an interdisciplinary investigation into the outcome of treatment designed to enhance the prognosis of periodontally involved teeth and to improve the appearance of the esthetic zone.

CASE DESCRIPTION

A 17 year old girl reported to the *Department of Periodontics, FODS, C.S.M.M.U.* The patient was in excellent general health with no known allergies, no medications and denied use of tobacco. She agreed with the treatment plan and signed the consent form for her treatment.

The patient was presented with spacing and flaring of upper and lower anterior teeth with poor oral hygiene. The patient had generalized chronic periodontitis with grade I gingival recession present on labial surface of 31, 32, 41 and 42 and molar relation was Angle's Class I type 2 malocclusion (Fig. 1). The spacing was contributed by pressure of tongue on teeth with reduced periodontal support. The gingival tissue of the patient was also unhealthy due to undesirable air flow from mouth (mouth breathing, incompetent lips and large interlabial gap).



Figure 1 – Intra-oral photograph showing spacing and flaring of anterior teeth with missing papillae and gingival recession in lower anterior teeth.



Figure 2 – Patient with removable orthodontic appliance (Hawley's plate with Active labial bow)



Figure 3 – Showing good contact relationship of teeth with proper papillae formation and mild improvement in width of attached gingiva after completion of orthodontic treatment



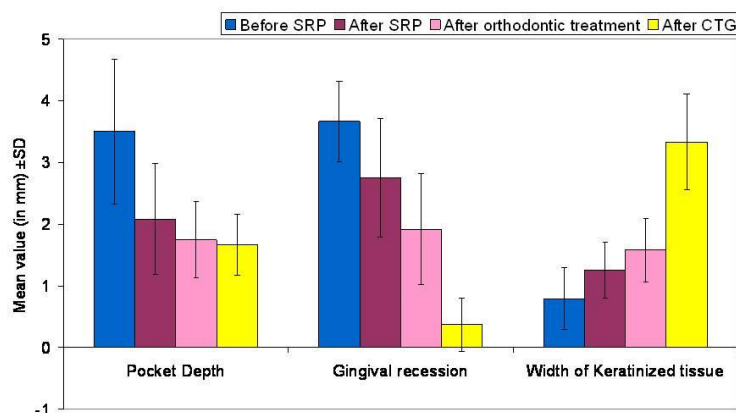
Figure 4 – harvesting connective tissue graft from patient's palate



Figure 5 – connective tissue graft transferred and sutured at the recipient site



Figure 6 – recipient site sutured



Graph 1

p<0.001 (ANOVA)

Graph 1: Differences in pocket depth, gingival recession and width of keratinized tissue after scaling and root planing, orthodontic treatment and connective tissue graft

Figure 7 - Final Intra oral photograph after 6 months showing coverage of gingival recession.

The PI (plaque index), PPD (probing pocket depth), CAL (clinical attachment level) and width of keratinized tissue were measured. Radiographic examination was carried out using I.O.P.A and OPG radiograph and diagnostic model analysis was done.

The periodontal treatment was initiated with scaling, root planing and oral hygiene instructions. The patient was recalled after 4 weeks and her periodontal condition was stable. After that the patient was referred to the Department of Orthodontics. Orthodontic treatment plan was finalized to use removal appliance (Hawley's plate with Active labial bow) as only tipping movement was required to correct the faulty inclination of anterior teeth (Fig 2). Hawley's appliance with active labial bow was delivered in U/L arches. Appliances were routinely activated (one dime width of old silver coin) at interval of each 21 days and removal of lingual side of acrylic as per required simultaneously to facilitate the consolidation of spacing. Finally, all spaces were closed after active therapy of 16 months (Fig. 3). The same appliance was used as retainer for the next 16 months. The re-establishment of contact points allowed proper reformation of interdental papilla and improved clinical attachment level (graph 1, Fig. 3). Mouth wash and twice brushing throughout the treatment period was followed by the patient to maintain fastidious oral hygiene.

In the next step, root surfaces of 31, 32, 41 and 42 were debrided to remove all the irritants and to obtain smooth root surface. The sub-epithelial connective tissue graft (CTG) with coronally positioned flap was performed² (Fig. 4, 5 & 6). Patient was recalled after every one month for maintenance phase. With this mucogingival surgery almost 100 % root coverage was gained (Graph 1).

DISCUSSION

With the development of newer and better mucogingival techniques in dentistry, the interrelation among different super-specialities has become even

more important. Orthodontists and Periodontists can work together in different areas of problem to achieve results that are more stable and esthetically acceptable.

Pathological migration of anterior teeth due to loss of periodontal support is very common. This migration can result in the extrusion of teeth, loss of contact point and poor appearance of the esthetic zone³. In the absence of contacts between the adjacent teeth, papillae recede. Although many surgical procedures have been recommended for reconstruction of papilla^{4, 5, 6}, but complete patient satisfaction regarding esthetics is difficult to obtain. For that reason, orthodontic therapy was included in the treatment plan for the patient. With orthodontic therapy, the teeth came into normal contact with remodelling of alveolar crest, creating a pyramidal form in the inter-proximal region of 11, 12, 21 and 22 that enabled the creeping of dental papilla to fill the interproximal space. The anatomic environment surrounding the papilla thus can induce this 'creeping' papillary formation⁷.

In this case after orthodontic treatment the marginal tissue recession and width of keratinized tissue recovered naturally (fig.3). The experimental studies have shown that labial bone reforms in the area of dehiscence when the tooth is retracted towards a proper position of the root in the alveolar process^{8,9}. Facial movement results in reduced facial gingival dimension while an increase is observed following lingual movement¹⁰. It is therefore likely that the reduction in recession seen at a previously prominently positioned teeth that has been moved into more proper position, are accompanied by bone formation. This bony support before the soft tissue placement can bring the long term stable result in gingival recession coverage.

After the orthodontic treatment, the restoration of marginal recession in relation to 31, 32, 41 and 42 were obtained significantly through surgical approach of the sub-epithelial connective tissue graft with coronally displaced flap. The connective tissue graft was preferred

as it is considered as gold standard for root coverage and increasing width of attached gingiva¹¹. The periodontal plastic surgery thus brought the root coverage and increased the width of attached gingiva (Fig.7). The patient was finally satisfied and received her lost smile.

CONCLUSION

Periodontal plastic surgery and Orthodontic therapy have entered a new era where outcomes can be obtained in a predictable fashion. This applies not only to the treatment of periodontal disease but also to the improvement of esthetics. The orthodontic therapy not only thus helped in bringing the teeth in contact, but also in re-creation of papilla and the favourable morphology for gingival recession coverage.

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