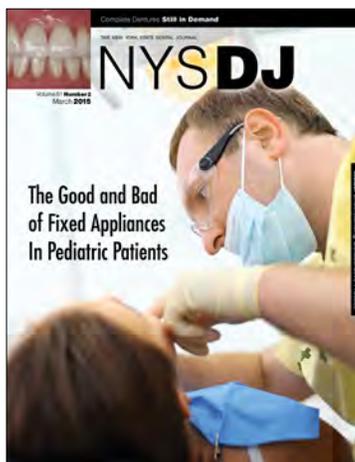


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Study was undertaken to determine the effect of a separated rotary instrument on the time required for bacterial penetration of obturated root canals using Resilon.

Successful Nonsurgical Management of Post-orthodontic Gingival Enlargement with Intensive Cause-related Periodontal Therapy

TaeHyun Kwon, D.D.S., M.M.Sc.; David M. Kim, D.D.S., D.M.Sc.; Liran Levin, D.M.D.

ABSTRACT

Successful nonsurgical management of severe post-orthodontic gingival enlargement and erythema in a 24-year-old male is presented. The patient received an intensive cause-related periodontal therapy, consisting of oral hygiene instruction, scaling and root planing, and weekly recall visits. At week five, complete resolution of the lesions was achieved. By targeting the primary etiologic factor, i.e., plaque, periodontal health was restored without needing surgical intervention. Reducing the bacterial load will give the biologic natural healing capacity of the body the opportunity to stabilize the periodontal condition and, thus, should be considered as the first line of intervention before a surgical approach is taken.

Periodontal complications might be a concern among patients undergoing orthodontic treatment.^{1,2} Clinically, patients might present with gingival enlargement, erythema and edema, which may be accompanied by pain, spontaneous bleeding and esthetic concerns. These lesions may persist after completion of orthodontic treatment.³⁻⁵ Orthodontic appliances such as fixed brackets and lingual fixed retainers can act as local plaque-retentive factors and, thus, might cause an environmental shift in microbial flora from

aerobic to predominantly anaerobic strains, including the so-called “red complex” periodontal pathogens.⁵⁻⁹ This microbial shift is often accompanied by elevated gingival crevicular fluid flow and its pro-inflammatory cytokine levels, such as interleukin-1 beta, transforming growth factor-beta 1.^{5,6,7} Thus, if untreated, they can result in irreversible destruction of the periodontium.^{1,10-12}

The purpose of this report is to describe a patient presenting with post-orthodontic gingival enlargement. Gingival enlargement is a condition that commonly develops during orthodontic treatment.^{3,7,13,14} Even after debonding, complete resolution is not often attainable^{3,13} necessitating surgical intervention, which may be complex and carry morbidity to patients.^{3,14,15} In this case report, an intensive, cause-related periodontal therapy targeting the etiologic factor, i.e., dental plaque, resulted in successful management of gingival enlargement.

Case Report

Following completion of orthodontic treatment, a 24-year-old male was referred to Harvard School of Dental Medicine, Division of Periodontology, for a gingivectomy procedure due to gingival enlargement. The patient was systemically healthy, with no history of smoking. His oral hygiene was poor. Clinical examination revealed severe gingival enlargement in the interproximal gingiva around the maxillary anterior teeth (Figure 1). Furthermore, there was generalized gingival inflammation, as suggested by erythema at the marginal gingiva (Figure 1). These conditions appeared in the last six months before completion of orthodontic treatment and debonding. Radio-

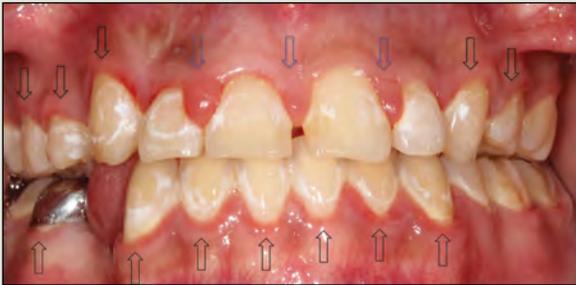


Figure 1. Clinical view of periodontal condition at initial presentation. Significant gingival enlargement was noted in maxillary anterior sextant (blue arrow). Generalized erythema was noted at marginal gingiva (black arrow). Generalized hypocalcified lesions were also noted on dentition, which may further suggest inadequate oral hygiene during orthodontic treatment.



Figure 2. Clinical view of periodontal condition at week two. Persistent gingival enlargement was noted in maxillary anterior sextant (blue arrow); however it reduced in size. Complete resolution of marginal gingival erythema was noted. Patient reported gingival ulceration due to brushing trauma (yellow arrow), and his brushing technique was reviewed. There was minimal amount of dental plaque on mandibular right first molar after using plaque disclosing solution (black arrow). All other areas were clinically free of dental plaque, which suggests improvement in patient's home care.



Figure 3. Clinical view of periodontal condition at week three. Further resolution of gingival enlargement was noted in maxillary anterior sextant (blue arrow). There was reduced amount of dental plaque on mandibular right first molar after using plaque disclosing solution (black arrow). All other areas were clinically free of dental plaque, which suggests adequate patient home care.



Figure 4. Clinical view of periodontal condition at week five. Complete resolution of gingival enlargement and gingival erythema was noted. Clinically, healthy gingiva was noted, free of any signs of inflammation. Patient's home care was maintained at adequate level.

graphic examination did not reveal any significant finding. The diagnosis of plaque-induced gingival enlargement was made.¹⁰⁻¹²

Intensive, cause-related, nonsurgical periodontal therapy was planned to avoid surgical treatment.¹⁶ At the initial treatment visit, the patient's oral hygiene status was assessed and scored using a plaque-disclosing tablet. It revealed generalized plaque deposits around the gingival margin and interproximal areas (O'Leary plaque score >90%).¹⁷ A personalized oral hygiene instruction program of removing dental plaque with a toothbrush and an interproximal toothpick (*Stim-U-Dent, Madison, Revive Personal Products Co., NJ*) was provided to the patient. The patient was instructed to use these aids three times a day. Finally, dental prophylaxis in conjunction with localized scaling and root planing treatment in the maxillary anterior sextant was provided to the patient.

Thereafter, the patient was recalled at weeks one, two and three (Figures 2, 3). At each recall visit, the patient's home care was re-assessed, reinforced and scored using a plaque-disclosing tablet; and the patient was immediately instructed to remove any residual plaque. Subsequently, supragingival debridement was performed. At week five, the patient's periodontal condition was re-evaluated (Figure 4). Clinical examination revealed complete resolution of the gingival enlargement and inflammation. Pre-existing gingival erythema and edema were no longer present. All periodontal clinical parameters were within normal limits, without any deep periodontal pocket or bleeding upon probing. No additional periodontal intervention was necessary.

The patient was scheduled for periodontal maintenance for every three months. His oral hygiene was excellent, as suggested by O'Leary plaque score index <5%.¹⁷

Discussion

During orthodontic treatment, patients are susceptible to developing gingival or periodontal disease.¹ Orthodontic brackets and wires may make it challenging to physically remove dental plaque around them and, thus, may act as local plaque-retentive factors.¹⁻⁹ Furthermore, Atassi and Awartani² found that approximately 60% of patients undergoing orthodontic treatment exhibited poor oral hygiene status. They also reported that 68% of patients reported not having a dental hygiene visit during their orthodontic treatment.² Similarly, Berlin-Broner, et al.¹⁸ found only 52% of patients reported that their orthodontist verified if they had attended regular checkups by their general dentists.

In comparison, continuous patient motivation by treating clinicians was associated with significant improvement in patients' gingival health during orthodontic treatment.¹⁹ In addition, Zanatta, et al.²⁰ found that orthodontic patients using dental floss regularly exhibited significantly better gingival conditions than those who did not use floss. Similarly, according to Silvestrini Biavati, et al.,²¹ proper toothbrushing during orthodontic treatment was associated with improvement in plaque and gingival indices.

Therefore, establishment of a stringent preventive program among a general dentist, an orthodontist and a patient is strongly recommended before initiating orthodontic treatment.¹ Through this program, patients should be able to demonstrate that they can effectively remove plaque using a toothbrush and interproximal cleaning aid. General dentists, as well as orthodontists, should also closely monitor patients' compliance with home care and their periodontal condition during the active orthodontic treatment phase, with frequent recalls and periodontal prophylaxis. In case of any emergence or recurrence of severe gingival or periodontal disease, treating clinicians should consider discontinuing orthodontic treatment until periodontal health is restored.

This case report demonstrates successful management of post-orthodontic gingival enlargement and inflammation. By targeting the primary etiologic factor—dental plaque—with stringent oral hygiene instruction, in combination with frequent supragingival cleaning, the patient's periodontal health was restored without needing surgery. Reducing the bacterial load by these means will give the biologic natural healing capacity of the body the opportunity to stabilize the periodontal condition and, thus, should be considered as the first line of intervention before the surgical approach is taken. ✍

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