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Challenges in Ortho - Perio Interaction – A Systemic Update

Pooja Kapoor[1*], Daljit Kapoor[2], Upasna Kapoor

[1]Department of Orthodontics and Dent of acial Orthopaedics Gian Sagar Dental College and Hospital, Ram Nagar, India
[2]Professor and Head, Department of Periodontics - Gian Sagar Dental College & Hospital

[*]**Corresponding author:** Pooja Kapoor, Department of Orthodontics and Dent of acial Orthopaedics Gian Sagar Dental College and Hospital, Ram Nagar, India, Tel: +91-9501093618; E-mail: pkaps82@gmail.com

Abstract

This article aims to provide the basic understanding of the interrelationship between orthodontic mechanotherapy in periodontally compromised situations for a complete update on the most recent view regarding the same in the best interest of the patients. While past studies have shown that orthodontic treatment can positively affect the periodontal health, recent reviews indicate an absence of reliable evidence for the positive effects of orthodontic therapy on patients' periodontal status[1].

Keywords: Ortho-Perio interaction; Review

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Introduction

This article aims to provide the basic understanding of the interrelationship between orthodontic mechanotherapy in periodontally compromised situations for a complete update on the most recent view regarding the same in the best interest of the patients.

Tooth movement during orthodontic therapy is the result of placing controlled forces on teeth. Removable appliances place intermittent tipping forces on teeth while fixed appliances can create continuous multidirectional forces to create torquing, intrusive, extrusive, rotational and bodily movement[2]. Bone surrounding a tooth subjected to a force responds by remodeling; resorption occurs where there is pressure and new bone forms where there is tension. When pressure is applied to a tooth, the Periodontal Ligament (PDL) is compressed; blood supply is minimized in the compressed area producing an avascular cell-free zone by "hyalinization". During this lag phase, tooth movement is practically nil. The hyalinized zone of tissue is removed for tooth movement to occur again.

Evidence suggests reduction of probing depth in intrabony defects following tooth extrusion[3,4]. The combination of orthodontic intrusion and periodontal therapy has also been shown to improve reduced periodontal conditions in animals, provided oral hygiene is maintained and tissues are healthy[5]. Intrusion of incisors in adult patients with marginal bone loss and deep overbite has been described with root resorption varying from 1 to 3 mm. It is suggested that intrusion is best performed with low forces (5 - 15 g/tooth) and in the presence of healthy gingival tissue[6]. Studies have also shown that moving teeth into adjacent osseous defects, orthodontic extrusion with and without fiberotomy and labial tipping of anterior teeth can be successfully accomplished without jeopardizing the periodontal support in the presence of adequate plaque control[7].

An important factor in the initiation, progression and recurrence of periodontal disease in is the presence of microbial plaque[8]. Clinical studies have demonstrated that with plaque control, teeth with reduced periodontal support can undergo successful tooth movement without compromising their periodontal situation[9]. However, orthodontic patient's inability to clean adequately contributes to the development of gingival inflammation apart from the mechanical irritation caused by the band or cement[10]. An increase of sub-gingival pathogens was also noted after intrusion[11]. Other studies have shown that after the achievement of surgical periodontal therapy, intrusive forces did not show any negative effect on the periodontium with a reduc-

tion in probing depth[12,13].

An adequate amount of attached gingiva is necessary for gingival health[14]. Thin, delicate tissue is far more prone to exhibit recession during orthodontic treatment than in normal or thick tissue. If a minimal zone of attached gingiva or thin tissue exists, a free gingival graft that enhances the type of tissue around the tooth helps control inflammation. This should be done before any orthodontic movement is begun[15]. Histological and histo-chemical specimens taken from sites of gingival invagination showed hypertrophy in the epithelial and the connective tissues, and sometimes, loss of gingival collagen[16] offering good sites for dental plaque and being a prime risk factor for the periodontal tissue disorders during orthodontic treatment[17]. It has been shown that most cases of gingival recession which occur during an orthodontic treatment occurred in the regions of the anterior upper and lower teeth[18-24].

Conclusion

Evidence suggests that proper emphasis on plaque control procedures prior to initiating orthodontic mechanotherapy, may well minimize the inflammation found later.

Recent advances like surgically accelerated modalities such as Selective Alveolar Decortication (SAD) and Periodontally Accelerated Osteogenic Orthodontics (PAOO) can be used as an adjunct to conventional approaches to accelerate orthodontic tooth movement with fewer adverse effects.

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