

CASE REPORT

Orthodontic therapy – The neglected etiology in periodontal diseases. Case series

Annapurna Ahuja^{*}, Vipin Ahuja^{}**

Introduction

The usual aim of orthodontic treatment is to achieve an optimized position of dentition characterized by a functional occlusion that generally leads to favorable conditions of the dento-alveolar architecture, which is more encouraging for maintaining the gingival and periodontal health. But improper orthodontic treatment, lack of patient education and motivation in oral hygiene maintenance during treatment are detrimental to periodontal health. In this case series we are discussing the effects of orthodontic treatment on periodontal health.

A B S T R A C T

Occlusion plays an important role in maintaining periodontal health. Irregularities of occlusion can be corrected by orthodontic therapy. But improper and excessive forces generated during orthodontic therapy may cause irreversible damage to periodontium and teeth. There are some reported cases where multiple teeth had exfoliated after orthodontic therapy due to root resorption. Orthodontic fixed appliances favors plaque accumulation which changes oral microbial environment and thus can cause gingivitis and gingival enlargement. Other problems associated with improper orthodontic therapy are gingival recession and bone loss. This article talks about the role of orthodontic therapy in periodontal diseases.

Key words: Orthodontic therapy, gingival recession, root resorption, gingival enlargement.

Gingival enlargement and orthodontic treatment:

CASE 1:

A 19 year old patient came to the department of Periodontics, College of Dental Sciences, Davangere, with a chief complaint of swollen gums (Fig-1). On taking thorough history and



Fig -1 Gingival enlargement during orthodontic therapy

clinical examination there was gingival enlargement, which was firm and fibrotic without much signs and symptoms of gingivitis except gingival bleeding on probing. The gingival margin was found impinging on clinical crown with pseudo pocket formation. Gingival enlargement was initially seen in the interdental papilla and it started 6-7 months after starting the orthodontic therapy. Patient was advised for scaling and proper oral hygiene instructions were given. After gingivectomy, chlorhexidine mouth wash was prescribed and the patient was

kept under observation. After 6 months, patient came again with gingival re-growth in the same region.

There are some case reports which addresses role of fixed appliances in causing gingivitis and gingival enlargement. Long term fixed appliances can contribute to untoward but predictable qualitative alteration in subgingival bacterial biofilm.¹ There is a plethora of literature supporting the fact that there will be 2-3 fold increase in both clinical indices and numbers of motile organisms after 6 months at sites of appliance.² This shift in microbial flora could be the reason for gingivitis, in addition to this mechanical irritation caused by the band or cement must be implicated.³ there are few other case reports in which rapid improvement of gingival tissues has been seen within 48 hours of the appliance being removed.⁴

Gingival recession and orthodontic treatment:

CASE 2

A female patient was referred to the department of Periodontics for oral prophylaxis. Patient chief complaint was incompetent lips due to the proclination of upper anterior teeth. Thorough

scaling was done and patient was sent for fixed



Fig 2. Position of marginal gingiva before orthodontic therapy in lower anteriors orthodontic therapy.



Fig 3. Gingival recession 9 months after initiation of an orthodontic therapy

The patient was referred to our department for an expert advice regarding the recession and mobility of 41, nine months after the initiation of fixed orthodontic therapy. On examination, we found grade I mobility and class II recession with 41. (Fig-3)

Literature has documented that, Isolated gingival recession may occur in as many as 30 per cent of adolescents undergoing orthodontic therapy.⁵ It was suggested that orthodontic tooth movement, especially beyond the labial or lingual alveolar

plate, may lead to gingival recession,⁶ causing root caries and hypersensitivity.

Results from an experimental study indicate that as long as the tooth is moved within the envelope of the alveolar process, the risk of harmful side effects on the marginal soft tissue is minimal.⁷ Gingival augmentations may be considered in the presence of thin keratinized gingiva when facial tooth movement is desirable; which may result in the establishment of alveolar bone and prevents marginal tissue recession.⁸

Bone loss, periodontal ligament destruction and root resorption in orthodontic treatment:

CASE 3

Another patient reported to the department with the chief complaint of loose teeth after orthodontic treatment. On history taking, it was implicated that she was a case of orthodontic relapse for midline diastema closure. Patient was kept on retainer for maxillary anterior teeth on upper lingual surfaces. Upper and lower anteriors were grade II and grade I mobile respectively and the patient gives a complaint of sensitivity to hot and cold food. On taking IOPA

of both upper and lower anteriors, we found bone loss and extensive root resorption with both upper (Fig-4) and lower anterior teeth.(Fig-5) Root resorption was so extensive that, only cervical third of the root was remaining in upper anterior teeth.

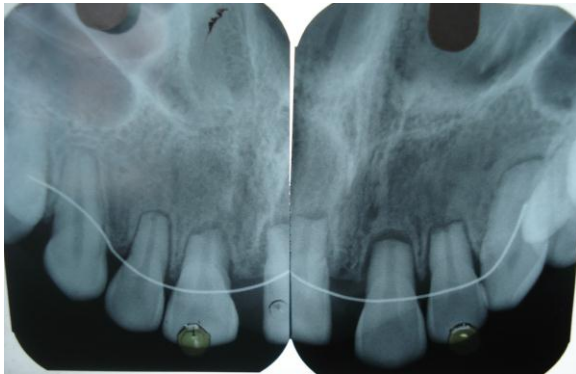


Fig 4. Bone loss and root resorption post orthodontic therapy

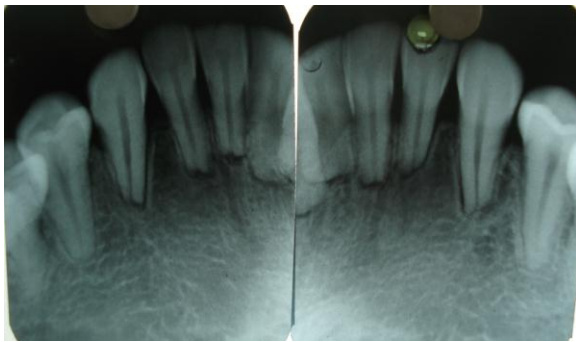


Fig 5. Root resorption in lower anteriors

Root resorption is the most common sequel of the orthodontic treatment, which is most common in the maxillary incisors than mandibular incisors.⁹It is an inflammatory process that occurs due to an ischemic necrosis in the periodontal ligament after the application of orthodontic force. The onset and progression

of root resorption is associated with risk factors related to the orthodontic treatment such as the duration of treatment, the magnitude of the force applied, the direction of the tooth movement, the method of force application (continuous versus intermittent), and the orthodontic movement. Patient-related risk factors are the individual susceptibility on a genetic basis, some systemic diseases, and anomalies in root morphology, dental trauma, and previous endodontic treatment. The periodic radiographic control during the treatment is necessary in order to detect the occurrence of root damages.¹⁰

Discussion: Deleterious periodontal health is the neglected menace in today's orthodontic era of dentistry. The question of whether orthodontic tooth movement may have deleterious effect on periodontal tissues has been evaluated in number of clinical and experimental studies. With the fixed appliances on teeth, oral hygiene apparently will be fruitless. Insufficient oral hygiene maintenance and increased retention of dental plaque with bands and brackets produces a worse scenario causing gingival recession, gingival enlargement and poor periodontal health.

Literature have accomplished that no injuries to tooth supporting tissue will occur, provided that the periodontal health and appropriate oral hygiene standards are maintained during the phase of orthodontic therapy. However, if the oral hygiene is less efficient and periodontal inflammation is present, periodontium will be at higher risk to unfavorable effects during orthodontic treatment.

Conclusion: Most adult orthodontic patients are highly motivated and do not need to be reminded of the necessity of good oral hygiene. Despite the best efforts, gingival inflammation and hypertrophy still occur with fixed braces. This may be due to a variety of factors including inflammatory reactions to the bonding agents used or gingival "bunching" secondary to tooth movement, or it may be idiopathic in nature. Skilled operators can overcome most of the biomechanical pitfalls, if meticulous oral hygiene and supportive periodontal care is recommended as an integral part of orthodontic therapy.

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ABOUT THE AUTHORS:



***Dr Annapurna Ahuja is a Reader in the Department of Periodontics and Implantology, ITS Dental college, Greater Noida, UP, India.**

Email address: annapurna.ahuja@yahoo.com



**** Dr Vipin Ahuja is a Reader in the Department of Paedodontics & Preventive Dentistry, Peoples College of Dental Sciences and Research Center, Bhopal, M.P.**

DOI: