The impact of orthodontic treatment on gingival recession: prevention and therapeutic strategiesl

Marco Clementin[1]**i**
Luca Signorini[1]
Roberta Lione[1]

[1] Saint Camillus International University of Health and Medical Sciences-Unicamillus, Rome, Italy..

***Corresponding Author**: Luca Signorini
e-mail:luca.signorini@unicamillus.org

Abstract

Gingival recession, defined as the apical migration of the gingival margin relative to the cementoenamel junction, is a noteworthy complication associated with orthodontic treatment. Its prevalence ranges from 3% to 38% among orthodontically treated patients and is influenced by multiple factors, including treatment mechanics, individual periodontal phenotype, and oral hygiene. The buccal surfaces of maxillary and mandibular teeth are particularly susceptible to post-treatment recession. Contributing factors include the application of excessive or improperly distributed orthodontic forces, tooth movement into areas with thin periodontal tissue, and plaque accumulation around orthodontic appliances. Effective prevention and management of gingival recession require a multidisciplinary approach. Key preventive strategies include comprehensive pre-treatment periodontal assessment, applying light and controlled forces, and strict oral hygiene maintenance during treatment. Post-treatment monitoring is essential for early detection and timely intervention. In cases where significant gingival recession develops, mucogingival surgical techniques, such as coronally advanced flaps or connective tissue grafts, offer predictable outcomes for the reconstruction of gingival tissues and stabilizing periodontal health. Collaboration between orthodontists and periodontists is crucial to optimize functional and aesthetic outcomes and ensure long-term stability of the dento-periodontal complex. Tailored treatment planning and early clinical intervention represent the cornerstone of successful orthodontic therapy with minimal periodontal risk.

Keywords: Gingival recession, Orthodontic therapy, Mucogingival surgery

Introduction

Gingival recession, characterized by the apical shift of the gingival margin from the Cemento Enamel Junction (CEJ) and root exposure[1], has garnered considerable attention in recent years, particularly in orthodontic treatment. It is often considered a significant post-treatment concern for orthodontic professionals and patients, as it may lead to aesthetic concerns, increased tooth sensitivity, and potential for further periodontal complications[2].

Prevalence of Gingival Recession After Orthodontic Treatment

Several studies have investigated the prevalence of gingival recession following orthodontic procedures, highlighting the variability in outcomes based on factors such as treatment approach, individual patient characteristics, and the specific areas of the mouth involved. The overall prevalence of gingival recession following orthodontic

How to Cite

Marco Clementini, Luca Signorini, Roberta Lione.
The impact of orthodontic treatment on gingival recession: prevention and therapeutic strategies.
Oral and Implantology
Vol. 17 No. 2 (2025), 193-195.
DOI 10.11138/oi.v17i2.151

treatment has been reported to range from 3 to 38% of treated patients, reflecting the broad spectrum of clinical situations[3-4]

A variety of factors contribute to this wide range. Firstly, mechanical forces applied during orthodontic treatment, particularly during the alignment and repositioning of teeth, can lead to a shift in the positioning of the gingiva. In some cases, these forces can result in gingival recession, mainly when significant tooth movement occurs in areas with already thin or inadequate periodontal tissue[5]

Additional risk factors include periodontal tissue characteristics, age, and oral hygiene habits. For example, individuals with sites presenting a thin gingival phenotype are generally more susceptible to recession when subjected to the forces of orthodontic treatment[1]. The buccal areas of the maxillary and mandibular teeth are often the sites where gingival recession is most commonly observed post-treatment[3-4].

Furthermore, orthodontic mechanics, such as excessive force or applying force vectors that stress the gingival attachment, can exacerbate the risk of gingival recession[5-6]. The presence of crowding or tooth misalignment before treatment may also predispose certain patients to higher incidences of post-treatment recession[7], as the presence of supernumerary teeth[8]

Prevention and Treatment of Gingival Recession

Given the potential for gingival recession following orthodontic treatment, preventive strategies and effective management are critical for mitigating the condition. Several approaches can be taken to prevent or manage gingival recession, which include careful treatment planning, clinical management during orthodontics, and post-treatment care.

1. Thorough Pre-Treatment Assessment

A detailed pre-treatment periodontal evaluation is crucial to identify at-risk patients. Factors such as the thickness of the gingiva, tooth position, and existing periodontal health must be carefully assessed. Orthodontic treatment planning should consider these factors to minimize the risk of recession[4] .

2. Use of Light Forces

Applying light, controlled forces during orthodontic treatment can reduce the risk of gingival recession. Excessive or poorly distributed force can place undue strain on the periodontal tissues, leading to recession. Orthodontists are increasingly moving towards techniques and appliances that use lighter forces to align teeth, reducing the potential for adverse effects on the gingival margin.

3. Proper Oral Hygiene

Patients undergoing orthodontic treatment must be educated on the importance of proper oral hygiene. Brushing techniques that avoid trauma to the gingiva and the use of adjuncts like interdental brushes or floss can help maintain periodontal health. The accumulation of plaque and bacteria around orthodontic appliances can exacerbate gingival inflammation and gingival enlargement (GE)[9] but also create gingival recession, so maintaining clean and healthy gums is essential [1].

4. Gingival Grafting Procedures

For patients who show site-specific risk factors (thin phenotype) or experience significant recession during or after orthodontic treatment, mucogingival reconstructive surgery is an effective treatment option. Procedures such as Coronally Advanced Flaps or Tunnel Techniques, with or without a connective tissue graft, or free gingival grafts can help to restore lost tissue and prevent further recession. These procedures involve moving coronally or laterally the residual keratinised tissue and/or harvesting tissue from the patient's palate or other areas and grafting it onto the receded area to enhance the gingival architecture and prevent further loss of gingival tissue[10-11-12].

5. Post-Treatment Monitoring

After orthodontic treatment, regular follow-up visits to monitor the health of the gingiva are essential. Early detection of any signs of recession or compromised periodontal health allows timely intervention[13]. Periodontal maintenance care, such as professional cleanings and oral hygiene instructions, is strongly recommended to prevent further gingival tissue loss[14].

Conclusion

Gingival recession remains a significant concern following orthodontic treatment, with a prevalence influenced by factors such as the force magnitude, treatment modality, and patient-specific characteristics[15]. However, the risk of recession can be minimized with careful treatment planning, application of light orthodontic forces, and proper post-treatment care. Preventive measures, early detection, and timely intervention through mucogingival reconstructive surgery can successfully manage the condition and enhance long-term oral health outcomes for patients undergoing orthodontics.

Effective collaboration between orthodontists and periodontists is essential in providing comprehensive care to mitigate the potential for gingival recession and ensure the stability of both functional and aesthetic results post-treatment.

References

1. Jepsen S, Caton JG, Albandar JM, Bissada NF, Bouchard P, Cortellini P, Demirel K, de Sanctis M, Ercoli C, Fan J, Geurs NC, Hughes FJ, Jin L, Kantarci A, Lalla E, Madianos PN, Matthews D, McGuire MK, Mills MP, Preshaw PM, Reynolds MA, Sculean A, Susin C, West NX, Yamazaki K. Periodontal manifestations of systemic diseases and developmental and acquired conditions: Consensus report of workgroup 3 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. *J Periodontol*. 2018 Jun;89 Suppl 1:S237-S248
2. Vignoletti F, Di Martino M, Clementini M, Di Domenico GL, de Sanctis M. Prevalence and risk indicators of gingival recessions in an Italian school of dentistry and dental hygiene: a cross-sectional study. *Clin Oral Investig*. 2020 Feb;24(2):991-1000.
3. Renkema AM, Fudalej PS, Renkema A, Kiekens R, Katsaros C. Development of labial gingival recessions in orthodon-

tically treated patients. *Am J Orthod Dentofacial Orthop*. 2013b;143:206-212.
4. Mandelli G, Mandelli A, Fiorillo G, Medoro L, Gastaldi G., Clementini M. Annual incidence and pre-treatment prognostic factors of labial gingival recessions in young orthodontically treated patients. *J Period Research* 2025 (accepted).
5. Wennström JL, Lindhe J, Sinclair F, Thilander B. Some periodontal tissue reactions to orthodontic tooth movement in monkeys. *J Clin Periodontol*. 1987 Mar;14(3):121-9.
6. Allais D, Melsen B. Does labial movement of lower incisors influence the level of the gingival margin? A case-control study of adult orthodontic patients. *Eur J Orthod*. 2003 Aug;25(4):343-52.
7. Lione R, Brunelli V, Franchi L, Pavoni C, Quiroga Souki B, Cozza P. Mandibular response after rapid maxillary expansion in class II growing patients: a pilot randomized controlled trial. *Prog Orthod*. 2017 Nov 6;18(1):36. Erratum in: *Prog Orthod*. 2018 Jul 12;19(1):26.
8. Clementini M, Ottria L, Pandolfi C, Agrestini C, Barlattani A. Four impacted fourth molars in a young patient: a case report. *Oral Implantol (Rome)*. 2013 Mar 19;5(4):100-3.
9. Lione R, Pavoni C, Noviello A, Clementini M, Danesi C, Cozza P. Conventional versus laser gingival enlargement during orthodontic treatment: a randomized controlled trial. *Eur J Orthod*. 2020;42(1):78-85.
10. Aroca S, Barbieri A, Clementini M, Renouard F, de Sanctis M. Treatment of class III multiple gingival recessions: Prognostic factors for achieving a complete root coverage. J Clin Periodontol. 2018 Jul;45(7):861-868. doi: 10.1111/jcpe.12923. Epub 2018 Jun 15. PMID: 29757468.
11. Clementini M, Discepoli N, Danesi C, de Sanctis M. Biologically guided flap stability: The role of flap thickness including periosteum retention on the performance of the coronally advanced flap–A double-blind randomized clinical trial. *J Clin Periodontol*. 2018;45:1238–1246.
12. de Sanctis M, Clementini M. Flap approaches in plastic periodontal and implant surgery: critical elements in design and execution. *J Clin Periodontol*. 2014 Apr;41 Suppl 15:S108-22. doi: 10.1111/jcpe.12189. PMID: 24640996
13. Ballanti F, Lione R, Fiaschetti V, Fanucci E, Cozza P. Low-dose CT protocol for orthodontic diagnosis. *Eur J Pediatric Dent*. 2008;9(2):65-70.
14. Romandini M, Soldini MC, Montero E, Sanz M. Epidemiology of mid-buccal gingival recessions in NHANES according to the 2018 World Workshop Classification System. *J Clin Periodontol*. 2020 Oct;47(10):1180-1190.
15. Izzi F.; Frijo G.; Romito M.; Benvenuti C.C.; Izzi G.; Severino M.; Nagni M.
16. Orthodontic approach in patients with osteogenesis imperfecta
17. ORAL and Implantology, Vol. 16 No. 1 (2024), https://doi.org/10.11138/oi16129-31