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Correction of midline diastema and severe gingival recession with periodontal surgery and orthodontic treatment: A case report with 20 years of follow-up

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ABSTRACT

This case report describes the 20-year outcomes of multidisciplinary treatment in a patient with severe gingival recession, inadequate attached gingiva, and severe midline diastema. Following phase 1 periodontal treatment, mucogingival surgery was performed to create an adequate gingival area in a systematically healthy 20-year-old female patient, followed by orthodontic treatment 3 months postoperatively. The width of the keratinized gingiva increased, the gingival margin moved coronally, and the formation of a new papilla was successful. After 20 years, clinical improvement has remained steady.

Introduction

Gingival recession (GR) refers to the apical displacement of the gingival margin and exposure of the localized or generalized root surface (1,2). Moreover, GR causes esthetics problems and increases the risk of developing hypersensitivity and root caries (3,4). Mucogingival surgeries are performed to correct gingival position and morphology.

This case report aims to describe the multidisciplinary treatment of a patient with an unesthetic appearance due to severe midline diastema, inadequate keratinization of the gingiva, and GR at the anterior mandibular region, followed over 20 years.

Case Presentation

A 20-year-old healthy women admitted to the Gülhane Military Medical Academy, Center for Dentistry Sciences, Department of Periodontology for cosmetic rehabilitation of the diastema between lower middle incisors and GR. Intraoral examination revealed severe GR, inadequate attached gingiva, aberrant frenulum attachment, prominent midline diastema, chronic gingivitis, and orthodontic problems, such as malalignment of the mandibular incisors, labial proclination, and rotation (Figure 1A). After intraoral examination, the width of the keratinized gingiva (WKG) was recorded as 0. GR records were 3 mm for the right and left lower central incisors at the vestibule site, 1 mm at the mesial site of the right lower central tooth, and 2 mm at the mesial site of the left central tooth. The teeth had no pathologic mobility, and the fremitus test result was negative (5).

After the patient completed phase 1 treatment and provided written informed consent, a free gingival graft was harvested from the palate with the overlying epithelium. A graft of approximately 1.5-2 mm thickness was adapted to the recipient site and fixed to the intact keratinized gingiva using non-absorbable sutures (Figure 1B). Three months after surgery, WKG was 7 mm on the right and 6 mm on the left incisors (Figure 1C). The GR of the right central incisor tooth was 3 mm at the buccal site and 1 mm at the mesial site. The diameter was 3 mm at the buccal region and 2 mm at the mesial region of the left central tooth. As a next step, the patient was advised to undergo orthodontic treatment (5). With the orthodontic treatment, creeping attachment formation was observed, and the attached gingival zone increased significantly (Figure 1D). After a 6-month orthodontic treatment, the WKG was 10 mm for the right central tooth and 9 mm for the left central tooth. A 0.5-mm GR was observed only in the vestibule of the left incisor (Figure 1E). Annual controls were planned for the following years (5).

The clinical periodontal status was measured during the 12-year follow-up. The mean WKG was 10 mm for the left incisor and 9 mm for the right incisor. The diastema between the lower central teeth recurred due to the patient's not coming to follow-up regularly, experiencing a pregnancy period, losing the integrity of the lingual retainer, and extraction of the lower second premolar. Since the patient did not want to undergo orthodontic treatment again, composite restorations were made to provide contact with the mesial surfaces of the lower central teeth to improve the esthetic appearance (Figure 2A). Thus, successful papillary reconstruction was achieved via the following process.

In the 20-year follow-up examination, it was noted that the mean WKG was 9 mm for the left incisor and 8 mm for the right incisor (Figure 2B). In conclusion, the patient was happy with her current condition. Keratinized gingiva was formed after the procedures, and the closed diastema remained stable.

Discussion

Before planning dental recession treatment, understandin the predisposing factors is essential. Orthodontic treatment should be considered in addition to a periodontal treatment for poorly aligned teeth with GR (6). Malhotra et al. (7) found

Figure 1. A) Mucogingival problems on the labial aspect of the lower incisors. Note the gingival recession, inadequate keratinized gingiva, and aberrant frenal attachment illustrated by a dashed line. B) Appearance after FGG surgery. C) Appearance of the graft 3 months after the surgery. The appearance of a newly composed keratinized gingiva and a new line of mucogingival junction is illustrated by a dashed line. D) Activation of the "T-loop" to close the midline diastema is illustrated by arrows. E) Reconstruction of periodontal structures following the orthodontic treatment illustrated by arrows (*with permission from Turkish Journal of Medical Sciences)*

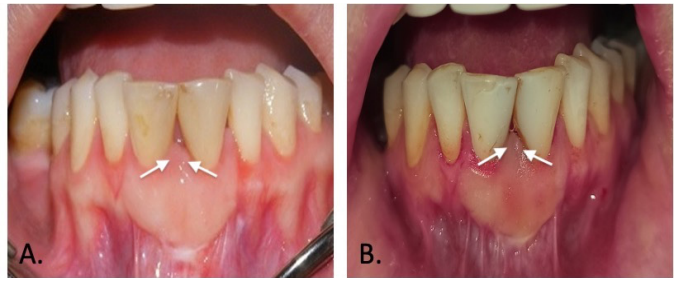

Figure 2. A) Intraoral appearance at 12 years follow-up after composite restorations to make papilla reconstruction since the patient did not want to undergo orthodontic treatment again. B) Intraoral appearance of the reconstructed papilla after 20 years follow-up illustrated by arrows

that an interdisciplinary periodontal-orthodontic approach may be more beneficial in obtaining better primary clinical parameters and esthetics in the treating malaligned mandibular anteriors. Similarly, in the present case, it was observed that clinical parameters, such as attached gingival width, improved with orthodontic treatment. As a result of the movement of the incisor teeth in the lingual direction with orthodontic treatment, the gingival edge moved coronally, resulting in the formation of a new papilla (5). In addition, the examination performed 20 years later revealed that the formation of papillae, which fill the interdental space between the incisors, continued. In a similar 12-year follow-up study, clinical improvement was achieved and successfully maintained with multidisciplinary treatment (8). Other studies have also shown the long-term success of multidisciplinary treatment approaches and soft tissue surgery (9,10).

Diastema loss of the interdental papilla may lead to esthetic and phonetic problems (11). The contact points of the teeth must be provided by proper closure of the diastema for interdental papilla reconstruction without periodontal defects (12). In our case, papilla reconstruction was achieved via periodontal surgery, followed by orthodontic treatment and reshaping of the contacts using composite restorations. Although the diastema recurred between the lower central teeth due to poor attendance and loss of integrity of the lingual retainer, the reconstructed papilla was still stable. In addition, when teeth are moved to a suitable position during the alveolar process, GR can decrease and be accompanied by bone formation. Orthodontic tooth movement is a stimulating factor in bone apposition. In a study involving dogs, Karring et al. (13) showed that lingual movement of teeth can result in bone augmentation. In this study, improved periodontal status was linked to the movement of teeth.

Conclusion

In this case, the biological and functional issues were resolved, and an esthetic improvement was achieved and maintained for over 20 years.

This case report recommends considering multidisciplinary treatment approaches to improve clinical outcomes. More long-term studies with large patient groups are needed to understand the exact mechanism of clinical improvement in the soft and hard tissue components of the periodontium.

Ethics

Informed Consent: Consent form was filled out by a participant.

Authorship Contributions

Surgical and Medical Practices: I.S., Ş.K., Concept: I.S., Ş.K., Design: I.S., Ş.K., Data Collection or Processing: M.Ö.S., V.U.B., Analysis or Interpretation: M.Ö.S., V.U.B., Literature Search: V.U.B., Ö.Ş.G., Writing: I.S., Ö.Ş.G., M.Ö.S.

Conflict of Interest: No conflict of interest was declared by the authors.

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References

1. Proceedings of the 1996 World Workshop in Periodontics. Lansdowne, Virginia, July 13-17, 1996. Ann Periodontol. 1996;1:1-947.
2. Roman A, Louise F, M'barek R, Brunel-Trotebas S. Gingival Recessions: Epidemiologic, Etiologic and Therapeutic Aspects. J Dent Sci. 2009;7.
3. Senna P, Del Bel Cury A, Rösing C. Non-carious cervical lesions and occlusion: a systematic review of clinical studies. J Oral Rehabil. 2012;39:450-462.
4. Kassab MM, Cohen RE. The etiology and prevalence of gingival recession. J Am Dent Assoc. 2003;134:220-225.
5. Saygun I, Karacay S, Ozdemir A, Sagdıc D. Multidisciplinary Treatment Approach for the Localized Gingival Recessions: A Case Report. Turk J Med Sci. 2005;35:57-63.
6. Graber LW, Vanarsdall RL, Vig KWL, Huang GJ. Periodontal/orthodontic interrelationships. In: Orthodontics - current principles and technique. 6th ed. Elsevier; 2017:621-628.
7. Malhotra S, Tewari S, Sharma R, Sharma RK, Tanwar N, Arora R. Clinical evaluation of root coverage in Miller class III/RT2 labial gingival recession treated with interdisciplinary periodontal-orthodontic therapy: a randomized controlled clinical trial. J Periodontal Implant Sci. 2023.
8. de Molon RS, de Avila ÉD, de Souza JA, et al. Combination of orthodontic movement and periodontal therapy for full root coverage in a Miller class III recession: a case report with 12 years of follow-up. Braz Dent J. 2012;23:758-763.
9. Keskiner I, Alkan A, Tasdemir Z. Free gingival grafting procedure after excisional biopsy, 12-year follow-up. Eur J Dent. 2016;10:432-434.
10. Jepsen K, Jaeger A, Jepsen S. Esthetic and functional rehabilitation of a severely compromised central incisor: an interdisciplinary approach. Int J Periodontics Restorative Dent. 2015;35:35-43.
11. Kokich VG. Esthetics: the orthodontic-periodontic restorative connection. Semin Orthod. 1996;2:21-30.
12. Prato GP, Rotundo R, Cortellini P, Tinti C, Azzi R. Interdental papilla management: a review and classification of the therapeutic approaches. Int J Periodontics Restorative Dent. 2004;24:246-255.
13. Karring T, Nyman S, Thilander B, Magnusson I. Bone regeneration in orthodontically produced alveolar bone dehiscences. J Periodontal Res. 1982;17:309-315.