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Controversy Related to Interdisciplinary Periodontal-Orthodontic Approach in Gingival Recession Coverage

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ABSTRACT

The aim of this review is to present controversial issue and available evidences in the literature related to the treatment of gingival recession associated with mal-aligned tooth using interdisciplinary periodontal-orthodontic approach. Gingival recession often causes dentin sensitivity, increase vulnerability to root caries and esthetic concern. Tooth mal-alignment is an important predisposing factor associated with gingival recession. In current era, people are often concerned about their esthetics and approach for root coverage. Clinicians must be aware about current evidences regarding treatment of gingival recession associated with mal-alignment.

Keywords: Dentin sensitivity, gingival recession, orthodontics, phenotype

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I. Introduction

Gingival recession is the displacement of marginal gingiva apical to the cementoenamel junction [1]. Various predisposing and precipitating factors lead to the displacement of gingival margin. Main etiologic factors in the pathogenesis of gingival recessions are periodontal disease and traumatic tooth brushing [2], [3]. Predisposing factors associated with it includes: labial orthodontic tooth movement [4], bone fenestration [5], thin phenotype [6] and tooth malposition [7].

The most widely used classification of gingival recession is Miller's classification [8]. It is based on a morphological evaluation of the injured periodontal tissue and includes four classes of recession defects. Recently Cairo introduced a classification based on clinical attachment loss [9]. Mucogingival surgical procedures for recession coverage includes laterally positioned flaps, coronally advanced flaps, free gingival grafts, tunnelling approach and subepithelial connective tissue graft (SCTG).

The concurrence of tooth malalignment and gingival recession orients treatment modality towards a combined periodontal-orthodontic approach. There is scarcity of evidences investigating the timing and indications of interdisciplinary treatment involving both recession coverage and tooth movement. Hence, the controversy persists pertaining to the chronology of treatment in patients with gingival recession scheduled to undergo orthodontic treatment. Another controversy is regarding the effectiveness of combined periodontal-orthodontic approach in recession coverage associated with malaligned tooth compared to mucogingival surgery alone.

II. Literature Review

Following studies entail the interdisciplinary approach of periodontal and orthodontic treatment:

Reference [10] recommended the use of autogenous free gingival graft to avoid progression of recession in children with 1 mm or less of keratinised tissue.

Reference [11] suggested that labial recession tends to decrease with retrusion of mandibular incisors and gingival grafting before orthodontic treatment does not further decrease the post-orthodontic gingival recession.

Reference [12] depicted that gingival grafting procedures can be done before the beginning of orthodontic treatment.

Reference [13] illustrated how a compromised tooth can be treated by an interdisciplinary treatment approach for complete root coverage in some Miller class III cases. Treatment plan consisted of autogenous free gingival graft followed by orthodontic alignment and levelling.

Reference [14] reported periodontics and orthodontics interdisciplinary approach lead to maintenance of periodontal health and ideal occlusal relationships.

Reference [15] conducted an interventional study and concluded that orthodontic movement of the root toward the center of the alveolar housing reduces gingival recession and improves prognosis with mucogingival surgery.

Reference [16] conducted a randomized controlled trial. This study concluded that recession coverage may be performed prior to orthodontic treatment as connective tissue graft stability is preserved throughout the course of orthodontic treatment.

III. Discussion

First controversy is related to chronology of treatment in patient having gingival recession scheduled to undergo orthodontic treatment. One approach suggests gingival augmentation before initiation of orthodontic tooth movement [10], [17]. This approach is based on the concept that minimum amount of attached gingiva is required for dissipating the forces of masticatory stresses, muscle pull and facilitating oral hygiene procedures [18]. According to [19], gingival inflammation and the thickness of gingival margin, are determining factors for the development of gingival recession and attachment loss during orthodontic tooth movement. Reference [20] investigated the role of periodontal biotype in the development of gingival recessions in patients who underwent orthodontic treatment. According to their study thin periodontal biotype and proclined orthodontic tooth movement are related to loss of keratinized tissue width. Thin periodontal biotype is susceptible to gingival recession, irrespective of the type of orthodontic movements [20].

Reference [21] conducted a systematic review to evaluate the timing and indication of soft tissue augmentation in orthodontic patients. Randomized controlled trial was not identified. Two studies of low to moderate level of evidence were included: one of prospective and retrospective data collection and one retrospective study. Both implemented mucogingival surgery before orthodontics. The review concluded that soft tissue augmentation prior to orthodontic treatment can be a possible treatment approach. However, the authors observed lack of high-level scientific evidence. After this systematic review, only one Randomized clinical trial addressing the similar aim has been conducted by [16]. The study concluded that mucogingival surgery may be performed prior to orthodontic treatment.

However, another approach suggests completion of orthodontic treatment before gingival augmentation. A few studies demonstrated that orthodontic therapy can alleviate the gingival recession if it is due to a tooth positioned outside alveolar housing [22], [23]. Further, they recommended gingival augmentation surgery after orthodontic treatment is completed. The orthodontic proclination of incisors outside their alveolar housing has been considered as a predisposing factor for gingival recession [24], [25]. However, there are studies who reported no correlation between orthodontic proclination of tooth and gingival recession [26], [27]. The mechanism behind the occurrence of gingival recession during orthodontic treatment is not clear. It has been hypothesised that presence of dehiscence in patient undergoing orthodontic treatment is a prerequisite for the development of gingival recession [28].

Second controversy is related to effectiveness of interdisciplinary periodontal-orthodontic approach in terms of root coverage percentage achieved in comparison to mucogingival surgery alone. Thorough search of literature revealed no randomized trial assessing the difference in root coverage percentage achieved using interdisciplinary periodontal-orthodontic approach versus mucogingival surgery alone for recession coverage in malaligned tooth.

IV. Conclusion

Gingival recession often causes esthetic concerns, increases vulnerability to root caries and dentin sensitivity. Tooth mal-alignment is an important predisposing factor in development of gingival recession. Stability in root coverage achieved in relation to mal-aligned tooth is an important aspect of the treatment. In terms of esthetics, percentage root coverage achieved using either interdisciplinary approach mucogingival surgery alone is another important issue and there is limited evidence in the literature addressing these issues.

Conflict of Interest

Authors declare that they do not have any conflict of interest.

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