

# ASSOCIATION OF TRAUMA FROM OCCLUSION AND GINGIVAL RECESSION IN MANDIBULAR ANTERIOR TEETH

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## ABSTRACT:

**Background:** Trauma from occlusion has been defined as injury to the periodontium resulting from occlusal forces that exceeds the reparative capacity of the attachment apparatus. It refers to tissue injury due to distorted occlusion. Gingival recession is the exposure of root surfaces due to apical migration of the gingival tissue margins.

**Objective:** The aim of this study was to evaluate the association of trauma from occlusion with gingival recession in mandibular anterior teeth.

**Materials And Methods:** This retrospective cross-sectional study was conducted from June 2019 to April 2020 using the patient records from the Department of Periodontics, Saveetha Dental College and Hospitals, Chennai. 200 patients with trauma from occlusion were recruited. Presence or absence of gingival recession in mandibular anteriors were studied. Data was tabulated in excel and statistically analysed.

**Results:** Among 200 patients with trauma from occlusion, 89 patients had gingival recession in relation to mandibular anteriors. There was no significant association between trauma from occlusion and gingival recession in mandibular anterior teeth (chi-square test;  $p= 0.120$ , not significant).

**Conclusion:** The present study showed no significant association between trauma from occlusion and gingival recession in mandibular anterior teeth.

**KEYWORDS:** Trauma from occlusion, Gingival recession, Mandibular anteriors, Periodontitis.

## INTRODUCTION

Periodontitis is a chronic destructive inflammatory disorder of the periodontium [1],[2] caused by the destruction of periodontal tissues namely the cementum, alveolar bone, PDL and gingiva [3]. Trauma from occlusion was defined by Stillman as "a condition where injury results to the supporting structures of the teeth by the act of bringing the jaws into a closed position" [4]. The consequences of trauma from occlusion include gingival recession, plaque retention, unaesthetic appearance, high risk of development of root caries, root surface exposure to the oral environment, hypersensitivity [5].

Gingival recession is defined as an apical shift in marginal gingiva. It increases in both prevalence and severity of age and mandibular incisor region is a commonly affected area [6]. Gingival recession usually causes an esthetic problem, especially when this problem affects the anterior tooth region, anxiety

arises about tooth loss due to progression of the destruction. It may also be associated with abrasion and/or cervical wear, erosion because of exposure of the root surface to the oral environment and an increase in accumulation of dental plaque [7].

Glickman classified trauma from occlusion according to duration of cause as acute trauma from occlusion and chronic trauma from occlusion and according to nature as primary and secondary. Etiological factors for trauma from occlusion are precipitating factors such as irritants and destructive occlusal forces that further destroy the tissues weakened by predisposing factors such as developmental factors, functional mechanisms and systemic components [8]. Other predisposing factors are loss of teeth, faulty restorative dentistry, injudicious periodontal surgery, faulty occlusal adjustment and temporomandibular dysfunction [9].

Tooth malpositions, high muscle attachment, frenal pull, calculus and iatrogenic factors related to restorative, periodontal treatment procedures, incisor inclination and other orthodontic treatments have been associated with gingival tissue recession [10]. The causes of receding gingiva, particularly of the lower mandibular area can be due to occlusal discrepancies and other factors. Occlusal trauma can be caused by crowding of lower anterior teeth, thrusting of mandible anteriorly on occluding because of posterior interdigitation and class III malocclusion [11]. Previously our team had conducted numerous studies [12],[13],[14],[15] which led to this study [16],[17],[18],[19]. The idea for this study stemmed from the current interest in our community. The aim of this study was to assess the association of trauma from occlusion with gingival recession in mandibular anterior teeth.

## Materials and Methods

This retrospective cross-sectional study was conducted from June 2019 to April 2020 using the patient records from the Department of Periodontics, Saveetha Dental College and Hospitals, Chennai. 200 patients (112 males and 88 females) with trauma from occlusion were recruited. Presence or absence of gingival recession in mandibular anteriors were studied. Data was tabulated in excel and statistically analysed. The study protocol was approved by the Institutional Ethical and Review Board.

## RESULTS

Out of 200 patients with trauma from occlusion, 89 (44.5%) patients presented with gingival recession and 111 (55.5%) patients had not presented with gingival recession. (Figure 1) Out of 200 patients with trauma from occlusion, there were 112 (56%) males and 88 (44%) females. (Figure 2) The age distribution of the study is as follows: 4% of them belong to 10 - 20 years, 25% of them belong to 21 - 30 years, 29% of them belong to 31 - 40 years, 22% of them belong to 41 - 50 years, 14.5% of them belong to 51 - 60 years and 5.5% of them belong to 61 - 70 years. (Figure 3)

Also, the association between trauma from occlusion and gingival recession in mandibular anterior teeth was found to be statistically not significant (chi-square test;  $p= 0.120$ , not significant).

## DISCUSSION

The trauma from occlusion is the damage in the periodontium caused by stress on the teeth produced directly or indirectly by teeth of the opposing jaw. It is an injury to the attachment apparatus as a result of excessive occlusal forces [20]. Gingival recession is the exposure of the root surfaces resulting from migration of gingival margin apical to the cemento enamel junction [21],[22] due to the loss of connective tissue. Mucogingival deficiencies, especially of the mandibular incisors, and the development of localised pathologic recession have been related to various etiological factors.

Gingival recession may be due to either individually or in combination which include minimally attached gingiva, thin alveolar bone, severe labial inclination, orthodontic treatment, fenestration of the alveolar bone or occlusal trauma [23],[24]. Localised gingival recession occasionally presents a problem in

adolescents. Marginal tissue recession can cause major functional and esthetic problems[25]. Interproximal recession creates space in which plaque, food and bacteria can accumulate [26],[27]. Association of gingival recession with trauma from occlusion are related to the intensity and duration of trauma [28].

In our present study, there was a male predominance in gingival recession. This is in concordance with Eid Hossam et al., who stated that high levels of gingival recession is significantly associated with a high prevalence in male gender [29]. The prevalence of this condition in the age group of 31-40 years and particularly in the age of 35 years was seen. Townsend et al., stated that gingival recession increases with severity of age [30]. Leo et al also stated that association of trauma from occlusion with gingival recession is frequently observed in adult subjects [31].

This study showed a no significant association between gingival recession in the mandibular anterior region and trauma from occlusion. Kemal et al., in his study revealed extensive gingival recession of mandibular canines and anterior segment. More prevalence was seen in patients with class III malocclusion and deep bite [32]. According to L. J. Jin, trauma from occlusion index and adaptability index were proposed for the identification of occlusal trauma and the response of periodontium to excessive biting power in heavy junctions. As a result, teeth with trauma from occlusion exhibited more clinical loss of attachment [33].

However, to confirm these findings, extensive research should be done on the effect of magnitude, duration and frequency of trauma from occlusion on periodontium.

## CONCLUSION

Within the limitation of this study, there was no significant association between trauma from occlusion and gingival recession in mandibular anterior teeth.

## ACKNOWLEDGEMENT

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## AUTHORS CONTRIBUTION

Bharathi R carried out the retrospective study by collecting data and drafted the manuscript after performing the necessary statistical analysis. Arvina Rajasekar aided in conception of the topic, participated in the study design, statistical analysis and supervised in preparation of the manuscript. Senthil Murugan P participated in the study design and coordinated in developing the manuscript. All the authors had equally contributed in developing the manuscript.

## Conflict of Interest

There were no conflicts on interest as declared by the authors

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**Figure 1:** Prevalence of gingival recession among study population

**Figure 2:** Prevalence of gender among study population

**Figure 3:** Prevalence of age among study population

**Figure 4:** Association of gender and gingival recession

**Figure 5:** Association of age and gingival recession

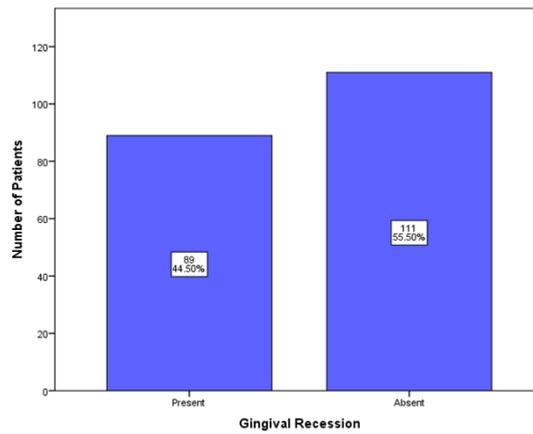


Figure 1: Bar graph representing the prevalence of gingival recession among study population. The x-axis represents the presence or absence of gingival recession and the y-axis represents the number of patients. From the graph, 89 (44.5%) patients presented with gingival recession and 111 (55.5%) patients had not presented with gingival recession. The prevalence of patients without gingival recession is more than patients with gingival recession

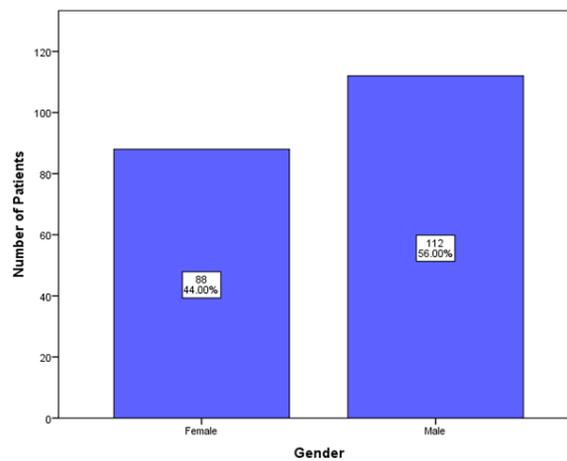


Figure 2: Bar graph representing the prevalence of gender among the patients with trauma from occlusion. The x-axis represents the gender and y-axis represents the number of patients with trauma from occlusion. From the graph, 112 (56%) males presented with trauma from occlusion and 88 (44%) females presented with trauma from occlusion. Therefore the prevalence of trauma from occlusion is more in male patients.

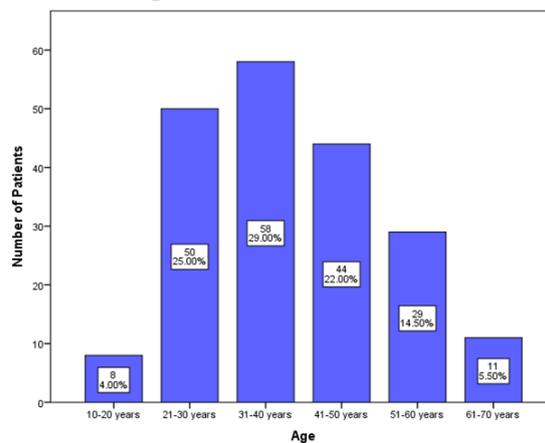


Figure 3: Bar graph representing the prevalence of age among the patients with trauma from occlusion. The x-axis represents the age and y-axis represents the number of patients with trauma from occlusion. From the graph, the age distribution of the study is as follows: 4% of them belong to 10 - 20 years, 25% of them belong to 21 - 30 years, 29% of them belong to 31 - 40 years, 22% of them belong to 41 - 50 years, 14.5% of them belong to 51 - 60 years and 5.5% of them belong to 61 - 70 years. Therefore the prevalence of trauma from occlusion is more in patients of the age group of 31-40 years.

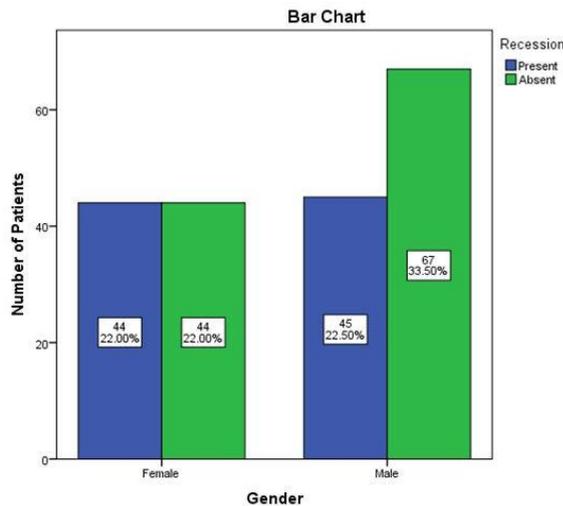


Figure 4: Bar graph representing the association of gender and gingival recession. The x-axis represents the gender and y-axis represents the number of patients. The blue colour represents the presence of gingival recession and green colour represents the absence of gingival recession. Chi-square was done and the association was found to be statistically not significant. Pearson's Chi Square value: 1.925, DF: 1, p value: 0.165(>0.05) hence statistically not significant, proving there is no significant association of gender and gingival recession. However, Majority of males (33.50%) do not have a gingival recession.

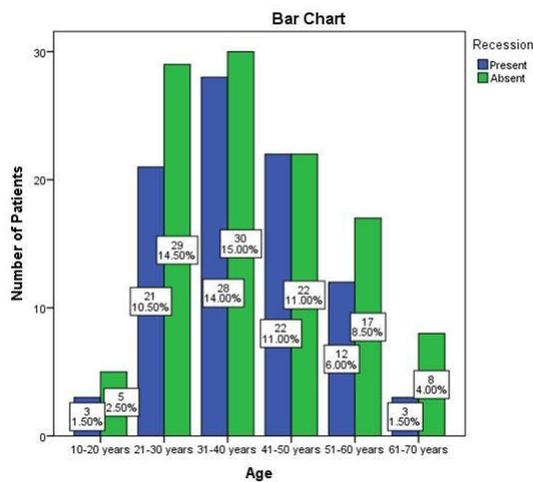


Figure 5: Bar graph representing the association of age and gingival recession. The x-axis represents the age group and y-axis represents the number of patients. The blue colour represents the presence of gingival recession and green colour represents the absence of gingival recession. Majority of the patients with age groups between 31-40 years (15%) do not have gingival recession. Chi-square was done and the association was found to be statistically not significant. Pearson's Chi Square value: 2.595, DF: 5, p value: 0.762(>0.05) hence statistically not significant, proving there is no significant association between age and gingival recession.