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Gingival Recession In Patients With Class II Division 2 Malocclusion Patients - A Retrospective Study

Research Article

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Abstract

Gingival recession is the displacement of soft tissue apically which eventually leads to root surface exposure. There are various factors causing gingival recession predominantly tooth malposition, occlusal trauma and high muscle attachment.When the gingiva recede away from their natural level they move downwards and start to expose the root portion of the tooth.To cover the exposed roots, root coverage can be considered. Root coverage can be done either with white bonding or filling material or with tissue grafting. The aim of the study is to evaluate the occurrence of gingival recession among Class II division 2 malocclusion patients. Records of patient records with Class II div 2 malocclusion were reviewed and analysed for presence or absence of gingival recession. 101 records were included in the study based on inclusion criteria. The presence or absence of gingival recession in these patients were recorded. Cross verification was done with the help of photographic evaluation. The tabulated data was imported into SPSS and analysed. The results showed that 18.8% of the study population presented with gingival recession.

Keywords: Class II Malocclusion; Class Ii Division 2; Gingival Recession; Malocclusion; Prevalence.

Introduction

Gingival recession is the apical shift in position of soft tissues covering the tooth, which leads to root exposure [1,2]. Gingival recession can be hazardous to the teeth.When the gingiva recede away from their natural level they move downwards and start to expose the root portion of the tooth. The root portion of the tooth is made up of cementum and this cemenutm is soft and susceptible to being worn away. This cementum does not replenish on its own. The problem with cementum being exposed is increased risk of developing cavities and sensitivity of the teeth. Mandibular anteriors are reported as a commonly affected area. This causes inclined incidence for root caries and dentin hypersensitivity [3,4]. There are various factors influencing the gingival recession. Tooth malposition, high muscle attachment, frenal pull, calculus can be the etiology. The periodontium is the protective barrier; as soon as it begins to break down, the teeth become vulnerable to additional destruction and loss. Studies have shown that periodontal disease can begin as a result of bad oral hygiene, or it may be the result of exaggerated hygienic measures that damage the gingiva. It can also result from an acute traumatic event that doesn't heal properly. Chronic trauma can be the reason for detachment of the gingival margin in the form of an irregular attachment of a frenum[5].Whereas tissue trauma due to aggressive teeth brushing is also a major contributing factor for gingival recession [6]. Gingival recession can also be caused due to certain iatrogenic factors such as restoration, periodontal treatment and orthodontic treatments [7-11]. Continuous functional stress may cause inflammatory changes in periodontal tissues therefore enhance destructive bacterial processes [12-14]. Previously our team has a rich experience in working on various research projects across multiple disciplines The [15-17][18-29]. To cover the exposed roots, root coverage can be considered. Root coverage can be done either with white bonding or filling material or with tissue grafting. This tissue can be taken from patients' own mouth or may be from an acellular dermal matrix. Before these graftings

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are done it is important to eliminate factors such as malocclusion, bruxism and any infection.This study is conducted to evaluate the occurrence of gingival recession among patients with class II division 2 malocclusion.

Materials And Method

Study Setting

This study is a university setting study. Case records of patients who had visited the university hospital between June 2019 to March 2020 were analysed and those patients with Class II division 2 malocclusion were included in the study. Prior to the study, ethical approval was obtained from the Institutional Ethical Committee. (Ethical approval number: SDC/SIHEC/2020/DIAS-DATA/0619-0320).

Sampling

It is a retrospective study in which totally 101 case sheets of patients with class II division 2 malocclusion were analysed. A non probability consecutive sampling method was followed. Cross verification of data for error was done by photographic evaluation and verified by additional reviewers. All patients with class II division 2 malocclusion were evaluated to minimize sampling bias.

Data Collection/Tabulation

Data of Class II Division 2 patients were collected and the presence or absence of gingival recession were analysed. All age groups and gender were included in the study. Data entered in MS excel was imported to SPSS. Incomplete or censored data were excluded from the study priorly.

Statistical Analysis

IBM SPSS 2.0 software was used for data analysis. Independent variables include - age, gender. Dependent variables include presence or absence of gingival recession. Descriptive and inferential statistics were used. Descriptive statistics included the frequency of distribution of patients' age, gender and inferential test included the Chi-square test to statistically analyse the association of gender and age group with occurrence of gingival recession.

Results And Discussion

In the present study, 59.4% were males and 40.6% were females (Figure 1). 81.2% of the subjects presented no gingival recession and only 18.8% had gingival recession (Figure 2). Age distribution showed that the gingival recession was more commonly seen in patients in the age group of 18-35 years and 19.8% of the patients in the age group of 9-17 years age groups showed least common occurrence of gingival recession (Figure 3). Association of age with gingival recession showed 18-35 year olds have 13 number of patients with gingival recession and 55 patients without recession P value > 0.05 (Figure 4).

By analysing the association of gender with gingival recession. In both the scenarios males were most common with 16 patients with recession and 44 patients without recession. While females were least with 3 patients with gingival recession and 38 patients without recession (Figure 5).

Previously our team have conducted various studies related to periodontal diseases and their association with stem cells [30], tumor necrosis factor [31], interleukin 21 [32], platelet rich fibrin [33], plasma rich grown factor [34], endothelin-1 [35,36] cathepsin K [37] herbal remedies [38] and viruses [39].Treatment for

Figure 1: The Bar Graph shows the gender distribution of the study subjects. The X axis represents the gender and the Y axis represents the percentage of patients with class II division malocclusion. From the graph it can be inferred that male patients (beige) reported more with class II division 2 malocclusion than the female patients (grey).

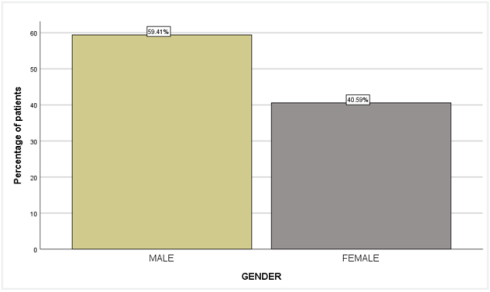


Figure 2: Bar graph shows the age distribution of the study subjects. The X axis represents the age in years and the Y axis represents the percentage of patients with class II division malocclusion. It can be inferred that the majority of the patients reported with class II division 2 malocclusion were among the age group of 18-35 years (light blue).

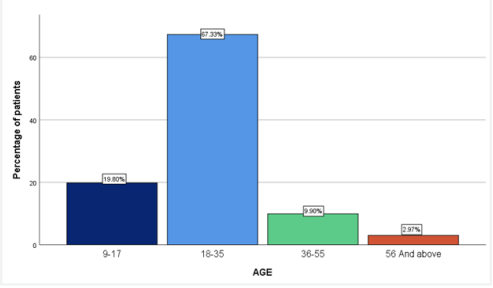


Figure 3: Bar Graph shows the proportion of patients with and without gingival recession. The X axis represents the presence or absence of gingival recession and the Y axis represents the percentage of patients with class II division malocclusion. It can be inferred from the graph that 18.81% of the patients with class II division 2 malocclusion presented with gingival recession.

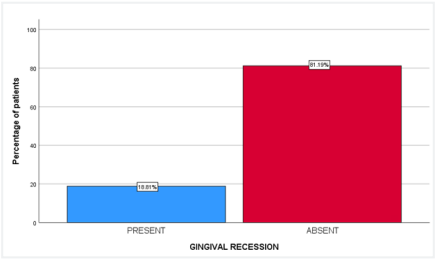


Figure 4: Bar graph shows the association between age group of patients and occurrence of gingival recession. The X axis represents the age group in years and the Y axis represents the number of patients with class II division malocclusion. From the bar graph it can be inferred that gingival recession was present more in patients in the age group of 18-35 years than any other age group, however it is statistically not significant. (Chi square test, p value- 0.119 (p >0.05 which is statistically not significant)).

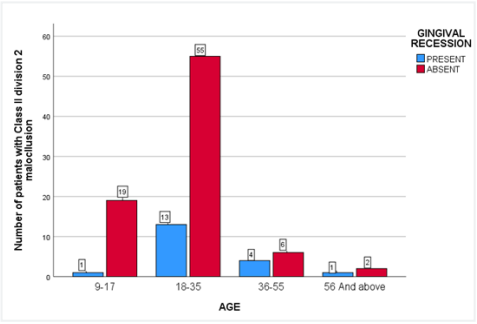
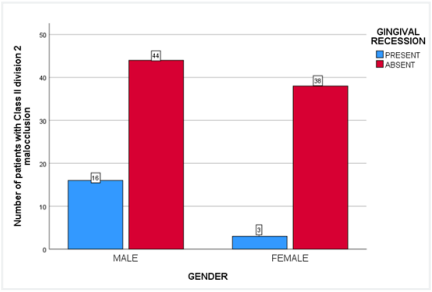


Figure 5: Bar Graph shows association between gender of patients and occurrence of gingival recession. X axis represents gender and the Y axis represents the number of patients with class II division malocclusion.From the graph it can be inferred that more number of male patients with class II division malocclusion showed gingival recession than female patients and this difference is statistically significant. (Chi square test, p value- 0.015 (p <0.05 which is statistically significant)).



gummy smile [40] and isolated gingival recession with coronally advanced flap [41]. association of pulmonary disease [42]and dental implants in chronic periodontitis [43] and variation in course of Inferior alveolar nerve [44].

This retrospective study was conducted to evaluate the presence of gingival recession among the class II division 2 malocclusion. The objective of the study was to determine the association of age, gender and occurrence of gingival recession among the class II division 2 malocclusion patients.

In this study we observed that 19 out of 101 patients with class II division 2 malocclusion exhibited gingival recession and males presented more than females. An epidemiological study in a Brazilian population showed prevalence of gingival recession among the younger population. 29.5% of the population in the 14-29 years old age group had recession less than 1 mm while 12.2% had recession more than 2mm and 12.2% of population had more than 3 mm [45].

A case report study by Kamal presented a patient with 5 mm negative overjet and 7 mm overbite. Occlusal trauma and mucogingival stress eventually caused gingival recession [46].In case of severe Class II Division 2 malocclusion with the linguo version of the maxillary incisors functional trauma can cause recession of the labial gingiva of the mandibular incisors.

Orthodontic treatment can be given in any malocclusion cases to improve anatomy and function of teeth. This can limit the recession, sometimes it can also induce spontaneous reattachment [47]. As mentioned above there are many causes of gingival recession, but the most important factor in children is the position of the tooth in the arch. Gingival recession occurs on the labial surface and on those that are tipped or rotated. But this recession may be

a transitional phase in tooth eruption and may correct itself when the teeth attain proper alignment or it may be necessary to realign teeth orthodontically [48].

Malocclusion and abnormal tooth position are now acknowledged as vital contributors to the disease process when they cause occlusal trauma. Excessive functional strain may provoke inflammatory changes in the periodontium and thus enhance destructive bacterial processes [12-14]. Our institution is passionate about high quality evidence based research and has excelled in various fields [49-59].The limitations of the present study include small sample size, geographical limitations, study involving small ethnic groups. Future studies may be done on determining the causative factors of gingival recession and its management.

Conclusion

Within the limitations of the study, the results showed that 18.8 % of the patients with class II division 2 malocclusion had gingival recession. Gingival recession was more commonly observed in males than females in patients with Class II division 2 malocclusion. This study emphasizes the importance of orthodontic correction of malocclusion and practicing proper oral hygiene in these patients. Future studies may need to study the prevalence of gingival recession caused by malocclusion in a large population and its treatment modalities.

Authors Contributions

First author [Vaishnavi Sivakali Subramanian] performed the analysis, and interpretation and wrote the manuscript. Second author [M. Jeevitha] contributed to conception, data design, analysis, interpretation and critically revised the manuscript. Third author [Aravind Kumar S] participated in the study and revised the manuscript. All the three authors have discussed the results and contributed to the final manuscript.

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