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Retrospective Analysis Of Prevalence of Gingival Recession in Severe Crowding Cases Patients Reporting to a Teaching Hospital in Chennai

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ABSTRACT

Introduction: Crowding is one of the most common forms of malocclusion. It is usually seen in the anterior region. Crowding mainly occurs in places where there is a discrepancy between the arch dimension and the size of the teeth there have been reports of gingival recession due to malocclusion in the early stages of development, but there are only few extensive studies about the topic. Hence, the aim of this study is to see the incidence of gingival recession in patients with severe crowding.
Materials and methods: Out of the 11687 patients who reported to a dental hospital that were diagnosed with crowding, 532 patients with severe crowding were selected. Details like their age, gender, the location of gingival recession and the location of crowding were recorded, tabulated and imported to SPSS for statistical analysis.
Results: 47.8% of the participants were male and 52.2% of the participants were female. There was a significant association between gender and location of crowding ($p<0.05$). There was no significance between age and crowding and age and location of recession.
Conclusion: It can be concluded that the incidence of gingival recession is higher in females who have severe crowding. A newer study with a population of more diverse participants can yield different results.

Key words: Crowding, Innovative study, Orthodontic, Recession, Malocclusion

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INTRODUCTION

Anterior crowding is one of the most common forms of malocclusion. The severity of crowding is influenced by various factors in the early and late stages of life. Factors like periodontal conditions, remodelling of bone and drift of tooth intensifies anterior crowding [1] and by relapse after orthodontic treatment [2,3]. Anterior teeth, especially lateral incisors and canines are most exposed to outside forces when compared to other teeth, which explains their durability [4]. This also explains why lower anterior teeth most commonly show gingival recession [5]. Commonly predisposing factors for gingival recession include malposition of tooth, tissue thickness, inadequate keratinized mucosa and pull of the frenum [6].

There are various articles which link improper orthodontic treatment to gingival recession. Tanaka et al. suggests that, improper control of tooth movement can lead to formation of bone dehiscence which ultimately leads to gingival recession [7,8]. However, there are not a lot of studies which focus on gingival recession due to malocclusion. The studies which focus on this have relatively smaller population sizes for their results to hold any significance. Hence, the aim of this study is to see the incidence of gingival recession in patients with severe crowding.

LITERATURE REVIEW

Study design and setting

The study was performed in the form of a retrospective study in a university setting, thus the available data is of patients from a similar geographical area. The study was conducted using digital case records of 13231 patients who were diagnosed with anterior crowding. Ethical clearance to conduct the study was taken from the scientific review board of the hospital.

Sampling

Data of 11867 patients were reviewed. Only cases with severe crowding were considered, hence, the final count was 532. Simple random sampling was performed. An additional reviewer was enlisted to help cross verify the data using photographs. Incomplete case sheets were excluded.

Data Collection

An examiner analysed the records of the patients who reported to the university from June 2020 to April 2021. For the present study, inclusion criteria were data of patients with anterior crowding. Data obtained were age, gender, location of crowding, and areas affected by recession. All obtained data was tabulated into Microsoft Excel.

Statistical analysis

The data was tabulated and analysed with SPSS (Statistical Package for Social Sciences) for Windows, version 23.0 and results obtained were displayed in percentage and frequency. *Chi Square test* was used to test association between categorical variables where age and gender were the independent and dependent variables. Pearson *Chi Square test* was used for analysis where p value <0.05 was considered as statistically significant.

RESULTS

Out of the 11867 patients who were diagnosed with crowding, 532 patients were included in the study. Out of these, 47.8% of the participants were male and 52.2% of the participants were female. The patients were divided into three age groups, namely 16-25 years: with 33.1% participants, 26-35 years: with 53.7% participants and 36-45 years: with 13.2% participants. The most common areas where crowding was seen were lower anterior and upper and lower anterior. The most common areas where recession was seen were lower anterior and generalized recession (Figures 1-4).

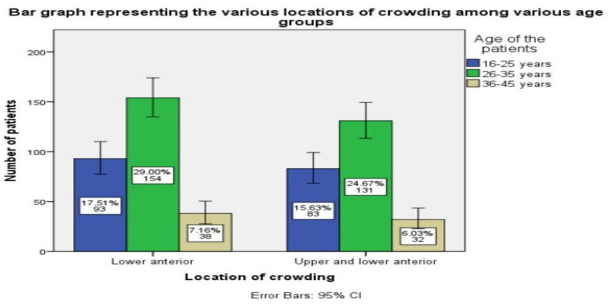

Figure 1: Bar graph representing the various locations of crowding among various age groups. The x axis displays the various locations of crowding and the y axis displays the number of patients. Blue displays the number of patients between the age of 16 and 25, green displays the number of patients between the age of 26 and 35 and beige displays the number of patients between the age of 36 and 45. P value was found to be 0.96 (p>0.05) which is statistically insignificant.

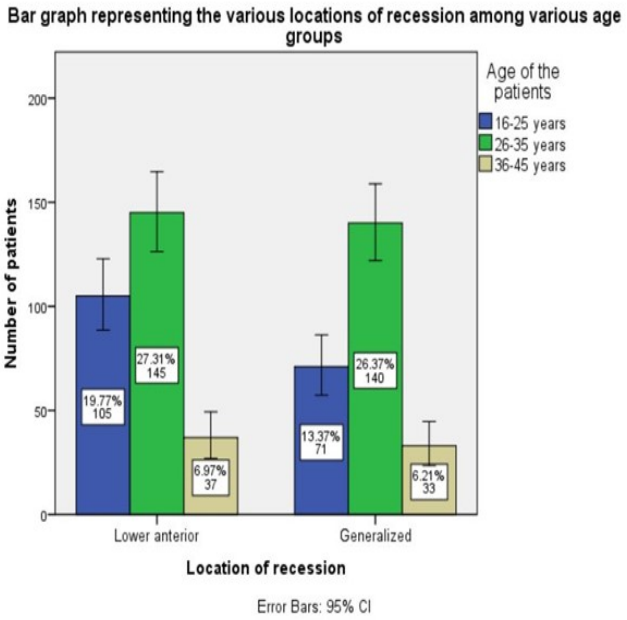

Figure 2: Bar graph representing the various locations of recession among various age groups. The X axis displays the various locations of recession and the Y axis displays the number of patients. Blue displays the number of patients between the age of 16 and 25, green displays the number of patients between the age of 26 and 35 and beige displays the number of patients between the age of 36 and 45. p value was found to be 0.18 (p>0.05) which is statistically insignificant.

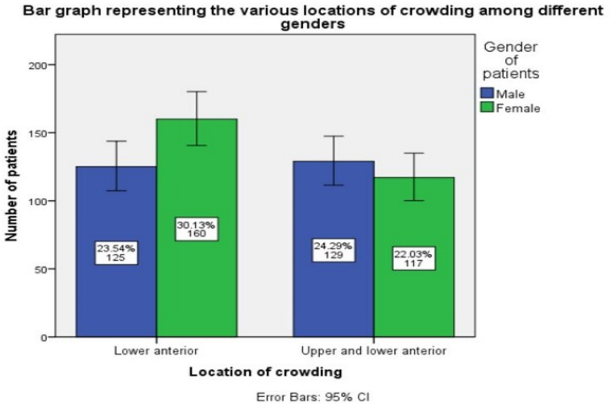

Figure 3: Bar graph representing the various locations of crowding among various genders. The X axis displays the various locations of crowding and the Y axis displays the number of patients. Blue displays the male patients and green displays female patients. p value was found to be 0.04 (p<0.05 which is statistically significant.

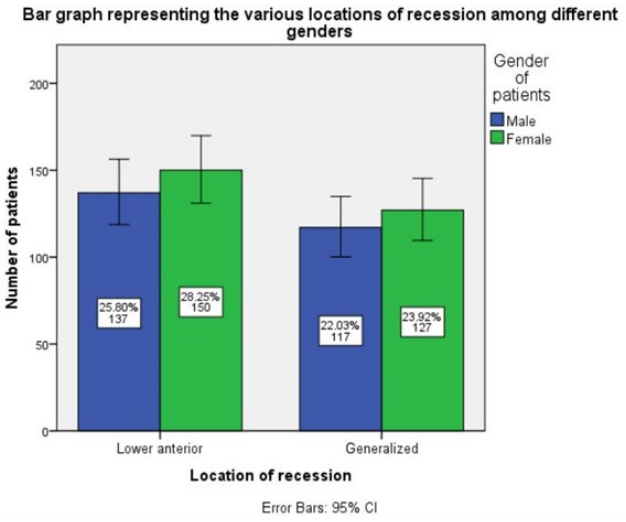

Figure 4: Bar graph representing the various locations of recession among various genders. The X axis displays the various locations of recession and the Y axis displays the number of patients. Blue displays the male patients and green displays female patients. p value was found to be 0.96 (p<0.05 which is statistically insignificant.

DISCUSSION

Our team has extensive knowledge and research experience that has translate into high quality publications [9-28]. Prevention of stress related reactions in the craniomandibular system can be done by orthodontic therapy. Crowding is one of the most common forms of malocclusions seen in the Indian population. It has a multifactorial etiology and factors like arch length, maturation of occlusion, balance of muscle, retention and loss of tooth may be linked to it [29]. In comprehensive orthodontic, recent studies have found that anterior crowding is not just limited to aesthetics but also causes functional issues [30].

Studies focussing on gingival recession due to crowding are scarce. Most studies focus on the incidence of gingival recession due to orthodontic treatment. Hence there were few articles to compare the current study with. In this study, it was found that there was a significant difference in the location of crowding among various genders, where females showed higher incidence of crowding than males in lower anterior. This is contradictory to the findings of a study done by Staufer where there was no relationship between recession and gender [3].

This study showed no relationship between age groups and recession. A study done by Richman et al also found no relation between age groups and recession [31]. But on the contrary, a study by Boymuradov showed that the incidence of gingival recession increased with an increase in age [32].

The progression of gingival recession is influenced by orthodontics even if it isn't caused by it. Orthodontic movement done keeping in mind the alveolar housing will retain bone in every aspect. If the tooth is pushed beyond this bony limit, formation of an underlying alveolar dehiscence will take place and the associated risk of progression will increase [33]. A lot of studies showed that orthodontic treatment to correct crowding was also an etiological factor in gingival recession. A study done by Kalinga showed that proper orthodontic planning can reduce the risk of gingival recession during orthodontic treatment [34].

The drawbacks of the current study are that the participants of the study belonged to a similar geographic location, which may have had an influence on the results. A more diverse study analysing the population belonging to a much more geographically diverse group could yield different results.

CONCLUSION

From the current study, it can be concluded that the incidence of gingival recession is more in females in the lower anterior region. There was no significant association between age group and the incidence of gingival recession. There is also no significant association between the location of crowding and age and the location of crowding and gender.

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