

Assessment Of Patients Undergoing Treatment For Single Tooth Crossbite - An Institutional Study

Research Article

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Abstract

A Crossbite can involve a single tooth or a group of teeth. It is a discrepancy in the buccolingual relationship of the upper and lower teeth. Cross-bite can be seen commonly in orthodontic practice and most patients ignore the treatment for a single tooth crossbite. The aim of the present study was to determine the number of patients seeking orthodontic treatment for single tooth crossbite in a private dental college and hospitals. The study was conducted in a university set up sample consisting of all patients who underwent orthodontic treatment for single tooth crossbite from June 2019 – April 2020, were examined and included in our data collection. A total of 41190 patient records were screened, out of that 492 patients had crossbite. Among those 492 crossbite patients about 91 patients of single tooth crossbite were selected. About 12 patients have undergone orthodontic treatment for single tooth crossbite. The statistical analysis was done using SPSS software (SPSS version 21.0, SPSS, Chicago II, USA). The data was analysed using a chi-square test. The p value of less than 0.05 was considered to be statistically significant. In this study, we can contemplate that only 13.2% people have undergone orthodontic treatment for single tooth crossbite. In comparison, the female population (22.2%) underwent more orthodontic treatment for single tooth crossbite than the male population despite the age group. There was a significant gender difference observed in the rising trend. (p value: 0.039 (p>0.05 statistically significant))

Keywords: Crossbite; Female Patients; Male Patients; Orthodontic Treatment; Single Tooth Crossbite.

Introduction

It is a discrepancy in the buccolingual relationship of the upper and lower teeth. Cross-bite can be seen commonly in orthodontic practice. It can be clinically identified, when the lower teeth are in a buccal or labial position regarding the upper teeth, in a unilateral, bilateral, anterior and/or posterior manner [1-3]. In the transverse dimension, normal occlusion is when the palatine cusps of the upper molars and premolars occlude in the fossa of lower molars and premolars. In the anteroposterior plane, the upper incisors occlude on the labial aspects of lower incisors. The term buccal crossbite refers to the buccal cusps of the lower teeth occlude buccal to the buccal cusps of the upper teeth. Scissor bite refers to the condition when the buccal cusps of the lower teeth occlude lingual to the lingual cusps of the upper teeth. Crossbite

malocclusion can have a skeletal or dental component or combination of both.

A Crossbite can involve a single tooth or a group of teeth. Cross bite can be classified as anterior or posterior. Depending on the etiology and clinical presentation, anterior cross bite can be classified into three main types namely dento-alveolar, skeletal and functional [4, 5]. Dento-alveolar anterior cross bite often involves a single tooth rather than multiple teeth. This simple anterior cross bite is mainly of dental origin and these patients have normal antero-posterior skeletal relationship. Skeletal anterior crossbite usually occurs as a result of a skeletal discrepancy in the maxilla (retrognathic) or the mandible (prognathic). Functional anterior crossbite is a type of pseudo class III malocclusion in which the mandible is postured forward from its true centric position. Sev-

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eral factors are reported as causes of anterior cross bite, including a lingual eruption path of maxillary incisors, retained primary incisors, potential crowding, presence of supernumerary teeth, trauma and class III skeletal pattern.

Posterior cross bite is one of the most prevalent malocclusions in the primary and early mixed dentition and is reported to occur in 8% to 22% of the cases [6, 7]. It is defined as any abnormal buccal-lingual relation between opposing molars, premolars, or both in centric occlusion. The most common form is a unilateral presentation with a functional shift of the mandible toward the crossbite side, which occurs in 80% to 97% of cases. The causes include any combination of dental, skeletal, and neuromuscular functional components, but the most frequent cause is reduction in width of the maxillary dental arch. Such reduction can be induced by finger sucking [8, 9] certain swallowing habits, or obstruction of the upper airways caused by adenoid tissues or nasal allergies [10, 11].

Single tooth crossbites can occur due to improper eruption of a primary tooth in a timely manner which causes permanent tooth to erupt in a different eruption pattern which is lingual to the primary tooth. Single tooth crossbites are often fixed by using finger-spring based appliances. Single tooth crossbites are not self-correcting and in some situations worsen during later stages of the dentition causing gingivitis, bone loss, periodontal problems. In severe cases, crossbites can affect jaw and face development, especially in young patients. In addition, a misaligned bite can leave a lasting mark escalating into a permanent deviation of the bones and skull on your face, speech impediments, and an unbalanced facial appearance. Many people are unaware of the need to correct single tooth crossbite. Previously our team has a rich experience in working on various research projects across multiple disciplines The [12-14, 15-26]. The main objective of this study is to evaluate the number of people and the negligence in undergoing single tooth crossbite correction. Hence this study was an attempt to find out the number of patients seeking orthodontic treatment for single tooth crossbite as there is no sufficient article regarding this issue.

Materials And Method

Study setting and sampling

This study is a single-center retrospective study, carried out in the Department of Orthodontics in a private dental college. The study was approved by the ethical board of Saveetha dental college – Institutional ethical committee [IEC] (SDC/SIHEC/2020/DIASDATA/0619-0320) and was in accordance with the ethical standards that were stipulated. All available records of Orthodontic patients from June 2019 – April 2020, were examined and included in our data collection. A total of 41190 patient records were screened, out of that 492 patients had crossbite. Among those 492 crossbite patients about 91 patients of single tooth crossbite were selected. About 12 patients have undergone orthodontic treatment for single tooth crossbite. Cross verification of data for error was done by presence of additional reviewers and by photographs evaluation. Simple random sampling was done to minimise sampling bias. It was generalised to the south indian population. Two examiners were involved in the study.

Data Collection/Tabulation

Acquisition of data was done from the hospital digital database which records all patients details. The data were entered in the system in a methodical manner. For this study, Data on the number of single tooth crossbite orthodontic patients and clinical variables such as their gender, treatment prognosis were collected. The data was then entered in excel manually and imported to SPSS for analysis. Incomplete or censored data were excluded from the study.

Statistical Analysis

Descriptive statistics were used to summarise the demographic information of the patients included in this study. Descriptive statistics is used for the acquisition of frequency of distribution of the data. The statistical analysis was done using SPSS software (SPSS version 21.0, SPSS, Chicago II, USA). The data was analysed using a chi-square test. The p value of less than 0.05 was considered to be statistically significant.

Results And Discussion

It is observed that only 13.19% of the patients are willing and about 86.81% of the patients are not willing for the single tooth crossbite correction. (GRAPH 1) The highest frequency was observed in males (60.44%) when compared to females (39.56%). (GRAPH 2) It is observed that females have undergone more orthodontic treatment for single tooth crossbite. The p value was found to be 0.039. There was a significant difference between the gender and treatment status of Single Tooth crossbite patients. (GRAPH 3) It is observed that people of age group 19-30 years have undergone more orthodontic treatment for single tooth crossbite. The p value was found to be 0.161. There was a significant difference between the age and treatment status of Single Tooth crossbite patients. (GRAPH 4)

In the present study, it is observed that only few people seek orthodontic treatment for single tooth crossbite. There are studies that evaluate the prevalence of cross bite but not the treatment status of the subjects involved in the study.

In a study by Jalber Almeida dos Santos et al in Brazil it was observed that 28.1% of school children have crossbite. Highest frequency was seen among 13 year olds (39.3%), followed by 14 year olds (32.0%). Regarding the type of cross bite 45.9% had unilateral cross bite, while 34.4% had anterior cross-bite [27].

When analyzing the gender in this study there was a higher prevalence for the male gender (60%). This finding distances itself from that found by Chowdhry et al(2019), which presented a tendency for females (47%) [28].

In a study conducted to evaluate the effect of class III malocclusion and crossbite on Craniomandibular dysfunction on a sample of 115 children and adolescent patients of both sexes it was found that of the total sample, the prevalence of crossbite was 30.4% [29].

Researchers during the occlusal development have reported that early decay and tooth loss, rotations, forward shift of the first molars, interferences, posterior crossbite, and mandibular shifts

predispose an individual to the development of the temporomandibular joint disorders and increase the sensitivity of the skeletal muscle. Williamson and Lundquist reported that interfering dental contacts have significant effects on volumetric muscle activity. A significant relationship was detected between the posterior crossbite and joint sounds, clicking, and muscle tenderness. Muscle tenderness is more common in children with crossbite than in children without crossbite [30]. Our institution is passionate about high quality evidence based research and has excelled in various fields [31-41].

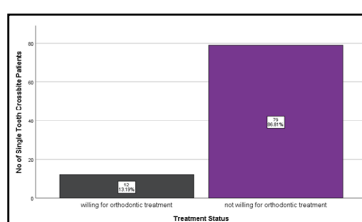
Hence, there is a need for educating the people about the need for orthodontic correction for single tooth crossbite. The pros of the

study includes flexibility, less time consumption and accessibility. The limitations of the study include varied population size and a distinct population group.

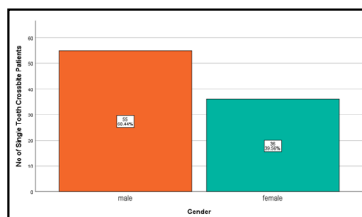
Conclusion

If left untreated, crossbites cause a series of health problems along with dental issues such as teeth grinding, irregular wear to the enamel, and loss of teeth and also crossbite patients report developing headaches and muscle tension from the abnormal stress placed on the jaw. In severe cases, crossbites can affect jaw and face development, especially in young patients. As we grow older, crossbite from childhood triggers severe pain in our jaw

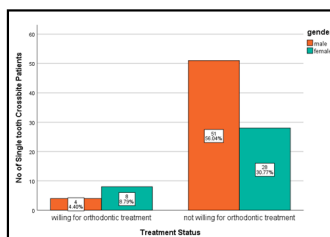
Graph 1: The bar graph showing frequency of Treatment Status of Single Tooth crossbite patients. X Axis represents the Treatment Status and Y Axis represents the number of Single Tooth crossbite Patients. It is observed that most of the patients are not willing (86.81%) for single tooth crossbite correction.



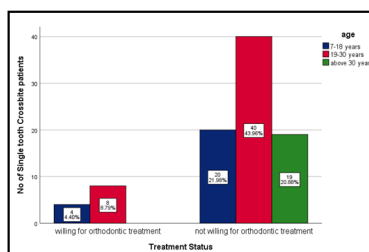
Graph 2: The bar graph showing frequency of gender wise distribution of Single Tooth cross bite patients. X Axis represents the gender and Y Axis represents the number of Single Tooth crossbite Patients. The highest frequency was observed in males (60.44%) when compared to females (39.56%).



Graph 3: The bar graph represents the association of gender and Treatment Status of Single Tooth crossbite patients. The highest frequency was noted among females when compared to males. It is observed that only a considerable amount of patients were willing for single tooth crossbite correction. There was a significant difference between the gender and treatment status of Single Tooth crossbite patients.(Chi – Square, p value: 0.039 (p<0.05 statistically significant)).



Graph 4: The bar graph represents the association of age and Treatment Status of Single Tooth crossbite patients. It is observed that people of age group 19 to 30 years and 7 to 18 years have undergone single tooth crossbite correction. Among those majority of the people willing for the treatment belong to the age group 19-30 years. There was a significant difference between the age and treatment status of Single Tooth crossbite patients. (Chi – Square, p value: 0.161 (p<0.05 statistically significant)).



joint and supporting muscles hence it is advised to correct crossbite at an early stage to enhance their chances of full correction and avoid any further shifts or deviations in their bite. Within the limits of the study, it was observed Only a considerable amount of people are willing to undergo single tooth crossbite correction hence there is a need for educating the people and the dentist about the need and importance of orthodontic correction for single tooth crossbite.

Authors Contribution

First author, Sandhya performed the data collection by reviewing patient details, filtering required data, analysing and interpreting statistics and contributed to manuscript writing.

Second author, Dr. Aravind Kumar Subramanian contributed to conception of study title, study design, analysed the collected data, statistics and interpretation and also critically revised the manuscript.

Third author, Dr. Senthil Murugan P 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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