



ISSN Print: 2394-7489
ISSN Online: 2394-7497
IJADS 2021; 7(4): 47-49
© 2021 IJADS
www.oraljournal.com
Received: 12-08-2021
Accepted: 19-09-2021

Dr. Jyoti Awahan
BDS, Tutor, Department of
Prosthodontics, Luxmi Bai
Institute of Dental Sciences and
Hospital, Patiala, Punjab, India

Dr. Manjunath Madhav
Professor, Department of
Orthodontics, Care Dental
College, Guntur, Andhra
Pradesh, India

Dr. Madhukar Awahan
BDS, Luxmi Bai Institute of
Dental Sciences and Hospital,
Patiala, Punjab, India

Corresponding Author:
Dr. Jyoti Awahan
BDS, Tutor, Department of
Prosthodontics, Luxmi Bai
Institute of Dental Sciences and
Hospital, Patiala, Punjab, India

A retrospective study on the prevalence of crossbite malocclusion in the North Indian Population

Dr. Jyoti Awahan, Dr. Manjunath Madhav and Dr Madhukar Awahan

DOI: <https://doi.org/10.22271/oral.2021.v7.i4a.1467>

Abstract

Introduction: Crossbite is a serious orthodontic disparity that affects many people throughout the world. Malocclusion is considered a major public health hazard. Because of the disruptions in dental health and dentofacial aesthetics, this may have an impact on one's quality of life.

Methods: From July 2021 to February 2022, a retrospective study was undertaken in a Dental College to determine the prevalence and associated factors for crossbite malocclusion in the North Indian population. The case records of patients who reported to the Dental Hospital for orthodontic treatment were used to select sample sizes of 510 people. The data variables were tabulated and analyzed using SPSS Version 20. They included socio-demographic information, the existence of crossbite, the location of crossbite, and the presence of class II malocclusion. Chi-Square tests and descriptive statistics were used.

Results: There were 30 records with crossbite in total. The age range of the patients was 9-51 years with a mean age of 25 years. Posterior crossbite (66.7%) was common followed by anterior crossbite (33.3%). In comparison to anterior crossbite, posterior crossbite was more common in males (61.11%) and females (75%).

Conclusion: The results can be used as a starting point for arranging orthodontic services, but they are not typical of the entire population.

Keywords: Crossbite, Malocclusion, Prevalence, Removable Appliance

Introduction

Crossbite is described as an abnormal relationship in the buccolingual or labiolingual direction between one or more teeth in one arch and the opposing arch ^[1]. It is a significant orthodontic discrepancy that affects a large number of people of varying ages. Crossbite, on the other hand, is most common in children during their growing years ^[2]. Interceptive orthodontic treatments are a very desirable early intervention to guide tooth eruption and rectify malocclusion ^[3]. Anterior and posterior crossbite are the two types of crossbite.

When both arches are in centric occlusion, Salzman defines anterior crossbite as the lingual positioning of maxillary incisors in relation to opposing mandibular teeth ^[4]. Dentoalveolar, skeletal, and functional classifications are available ^[5]. Dentoalveolar anterior crossbite is the most common type, and skeletal crossbite is caused by a retrognathic maxilla and a prognathic mandible ^[6]. In pseudo-class III malocclusion, functional crossbite is prevalent ^[6]. In clinical practise, anterior crossbite is characterised by a reverse overjet and premature tooth contact, resulting in mandibular displacement ^[7].

Foster defines posterior crossbite as the occlusion of the lower teeth's buccal cusps outside the arch of the upper teeth ^[8]. It can manifest itself as a unilateral or bilateral crossbite involving one or more teeth in the functional occlusal position ^[9]. The mechanism of posterior crossbite is the shifting of the mandible to one side, resulting in repeated and stable contacts, tooth wear, and aberrant tooth and jaw growth and development ^[10]. Canine crossbite is referred to as posterior crossbite ^[11].

Crossbite has been shown to be common in several studies. The prevalence of posterior crossbite was found to be 10.94 percent in a research by Anistotoaei *et al.* ^[12]. The likelihood of developing posterior crossbite in the primary dentition is higher for pacifier suckers than for finger suckers, according to a study on the incidence of crossbite in children with sucking

habits [13]. Early mixed dentition anterior and posterior crossbite is thought to be passed from primary to permanent dentition, with long-term implications for tooth and jaw growth and development [14]. As a result, to achieve a proper occlusion, interceptive orthodontic therapy is recommended. Orthodontists face a variety of issues, including dilacerated teeth, fractured tooth extrusion, deep bite correction, bonding failure, obstructive sleep apnea, micro implant failures, maxillary hypoplasia in growing children, and bisphosphonate adverse effects on tooth movement [15, 16].

However, in order to overcome the difficulties, a suitable diagnosis and treatment plan must be completed. Aside from that, the quantification of force applied by orthodontic auxiliaries is crucial [17]. To minimize small implant failures, it's also important to understand the stressed produce along the implant's surface [18, 19]. Previously, our team had extensive expertise working on a variety of research projects in a variety of areas [20, 21]. We decided to explore this project because of the growing trend in this field. The study's goal was to determine the prevalence of crossbite malocclusion in the North Indian population, as well as the factors that contribute to it.

Materials and Methods

Patients who visited a dental hospital between July 2021 and February 2022 were studied retrospectively. The Institutional Ethics Committee granted ethical approval for the study. The information was gathered from the medical records of patients who sought orthodontic treatment at a dental hospital. The study included patients with class II malocclusion and crossbite, but omitted those with temporomandibular joint disease. In this study, a total of 30 people with crossbite were chosen. Cross-verification was done using images and examined by a second reviewer to reduce bias.

Data variables such as age and gender, the presence of a crossbite, the location of the crossbite, and the presence of a class II malocclusion were obtained and recorded. The Statistical Package for Social Science (SPSS) Version 20 was used to analyze the data (IBM Corporation, New York, USA). The connection between the categorical variables was determined using the Chi-square test.

Results

The general goal of this study was to see if there was a link between crossbite and class II malocclusion in the North Indian population. The prevalence study aids the orthodontist in excluding early diagnosis and developing a treatment plan for a better treatment outcome.

A total of 30 subjects were selected in the study out of which 60% were males and 40% were females as shown in table 1. The age range of the patients was 9-51 years with a mean age of 25 years. Posterior crossbite (66.7%) was common followed by anterior crossbite (33.3%). Crossbite was more common in males (58.3%) than females (41.7%). Posterior crossbite was common in males (61.11%) and females (75%) compared to anterior crossbite.

Table 1: Distribution of study subjects

Gender	N (%)
Males	18(60)
Females	12(40)
Age range (in years)	9-51 (25 years)
Malocclusion	N (%)
Posterior crossbite	20(66.67)
Anterior crossbite	10(33.33)

Table 2: Distribution of malocclusion according to age

Malocclusion	Females n(%)	Males n(%)
Posterior crossbite	9(75)	11(61.11)
Anterior crossbite	3(25)	7(38.89)
Total	12(100)	18(100)

Discussion

The overall prevalence of crossbite in class II malocclusion was 6% in the current study. According to Anistoroaei et al, the prevalence of crossbite was 3.6 percent, which is lower than the current study [12]. Crossbite was found in 2.7 percent of class II malocclusions in another investigation [13]. According to Sultana et al, the prevalence of crossbite in class II malocclusion was 18.4%, which was greater than the current study [22]. Overall, we can see that in earlier research [12, 23], the prevalence of crossbite in class II malocclusion was lower than in class I malocclusion.

Previous research has found that females have a higher rate of crossbite than males, which contradicts the findings of this study [1, 12, 22, 24]. However, in a prior study [1, 12, 25], there was no statistically significant difference [1, 12, 25]. Males were more likely to have crossbite in a research by Woitchunas et al, which was similar to the current study [26]. A prior study found that anterior crossbite was prevalent in males with 35 percent and posterior crossbite was common in females with 47 percent, which contradicted the findings of the current study [22].

A prior study found a substantial link between malocclusion and crossbite, which contradicted the findings of the current study [12]. However, it also stated that crossbite was more common in class II division 1 (3.1%) than in class II division 2 (0.52%), which is consistent with the current study [12]. Crossbite was not detected among class II malocclusion patients in a research conducted by Al-Dabagh in Yemen [1]. Furthermore, this study found that posterior crossbite (67%) was more common than anterior crossbite (33%), which is consistent to a prior study [27].

The prevalence of crossbite study informs orthodontists about the significance of interceptive treatment to reduce the incidence of crossbite as patients get older. Depending on the diagnosis and prognosis of each case, many treatment options are available. Orthodontists employ a variety of methods to diagnose and plan therapy. In class II and class III inclinations, sagittally linear cephalometric dimensions can help with diagnostic and therapy planning [28]. Meanwhile, the gonial angle might be employed as a growth pattern indication in cephalometric analysis [29]. The study's sample size was tiny, and there was observer bias. More research is needed to link crossbite to other etiological factors and evaluate different treatment options for crossbite cases.

Conclusion

Within the study's limitations, it was determined that the total prevalence of crossbite. Males and girls both had posterior crossbites that were not substantial. Identifying occlusal issues, their frequency, and the need for treatment can aid in determining the best treatment plan and personnel requirements in orthodontics. Such epidemiological surveys are critical because they can aid in identifying the causes that cause malocclusion and, as a result, in developing preventive and intervention strategies as well as public awareness campaigns. The results can be used as a starting point for arranging orthodontic services, but they are not typical of the entire population.

References

1. Al-Dabagh DJ. The Prevalence of Crossbite of Young Adult Yemenis. *J College Dent.* 2003; 89.
2. Alnfeiy M, Batt KH, Almontshary A, Bamakhrama M, Abbasi A. Prevalence of Cross-Bite among School Children in Riyadh City; An Epidemiological Study Conducted in the Schools of Riyadh.
3. Kumar S, Roy AS, Chandna AK, Garg A, Chaudhary UK. Crossbite: An Orthodontic Exigency. *J Clin Diagn Res.* 2016;10(9):ZJ09-ZJ10.
4. Salzmann JA. Handicapping malocclusion assessment to establish treatment priority. *Am J Orthod.* 1968;54(10):749-65. Pubmed PMID: 5245740.
5. Phulari BS. *Orthodontics: Principles and Practice*, New Delhi: Jaypee Bros, 2011.
6. Singh G. *Textbook of orthodontics*. Jaypee-Brother, 2004.
7. Walther DP, Houston WJ. *Walther's Orthodontic Notes*. Butterworth Heinemann, 1983
8. Foster TD. *A Textbook of Orthodontics*. Blackwell Scientific Publications, Oxford, 1975.
9. Bishara SE, Saunders WB. *Textbook of orthodontics*. Saunders Book Company, 2001 Mar 21.
10. Kennedy DB, Osepchook M. Unilateral posterior crossbite with mandibular shift: a review. *J Can Dent Assoc.* 2005;71(8):569-73.
11. Ferro R, Besostri A, Olivieri A, Quinzi V, Scibetta D. Prevalence of cross-bite in a sample of Italian preschoolers. *Eur J Paediatr Dent.* 2016;17(4):307-309
12. Anistoroaei D, Saveanu IC, Cernei Er, Zegan G. The prevalence of posterior crossbite in a group of Romanian patients. *Int J Med Dent.* 2019, 23(2).
13. Modéer T, Odenrick L, Lindner A. Sucking habits and their relation to posterior cross-bite in 4-year-old children. *Scand J Dent Res.* 1982;90(4):323-8.
14. McNamara JA Jr. Early intervention in the transverse dimension: is it worth the effort? *Am J Orthod Dentofacial Orthop.* 2002;121(6):572-4.
15. Felicita AS. Orthodontic management of a dilacerated central incisor and partially impacted canine with unilateral extraction - A case report. *Saudi Dent J.* 2017;29(4):185-193.
16. Felicita AS. Orthodontic extrusion of Ellis Class VIII fracture of maxillary lateral incisor - The sling shot method. *Saudi Dent J.* 2018;30(3):265- 269.
17. Dinesh SP, Arun AV, Sundari KK, Samantha C, Ambika K. An indigenously designed apparatus for measuring orthodontic force. *J Clin Diagn Res.* 2013;7(11):2623-6.
18. Sivamurthy G, Sundari S. Stress distribution patterns at mini-implant site during retraction and intrusion--a three-dimensional finite element study. *Prog Orthod.* 2016;17:4.
19. Felicita AS. Quantification of intrusive/retraction force and moment generated during en-masse retraction of maxillary anterior teeth using mini-implants: A conceptual approach. *Dental Press J Orthod.* 2017;22(5):47-55.
20. Jain AR. Prevalence of partial edentulousness and treatment needs in rural population of South India. *World J Dent.* 2017;8(3):213-7.
21. Varghese SS, Ramesh A, Veeraiyan DN. Blended Module-Based Teaching in Biostatistics and Research Methodology: A Retrospective Study with Postgraduate Dental Students. *J Dent Educ.* 2019;83(4):445-450.
22. Sultana N, Hassan GS, Jha D, Nashrin T, Nahar L, Naim MA. Prevalence of cross bite among the orthodontic patients in Bangabandhu Sheikh Mujib Medical University. *Bangladesh J Med.* 2015;26(1):9-12.
23. Bugaighis I, Karanth D. The prevalence of malocclusion in urban Libyan schoolchildren. *J Orthod Sci.* 2013;2(1):1-6.
24. Naeem S, Asad S, Waheed-UI Hamid M. Prevalence of cross bite in orthodontic patients. *Pak Oral Dent J.* 2009;29:279-80.
25. Asiry MA. Occlusal Status among 12-16 Year-Old School Children in Riyadh, Saudi Arabia. *J Int Oral Health.* 2015;7(5):20-3.
26. Woitchnunas DR, Busato C, Tochetto LR, Brockstedt RH. Anterior crossbite: diagnosis and treatment of pseudoclass III-clinical case report. *Rev Fac Odontol UPE.* 2001;6(2):23-8.
27. Chowdhury MS, Sultana N, Naim MA, Nashrin T, Nahar L. Prevalence of Cross Bite among the Orthodontic Patients at a Dental Unit of Bangladesh. *J Natl Inst Neurosci Bangladesh.* 2019;5(2):167-71.
28. Felicita AS, Chandrasekar S, Shanthasundari KK. Determination of craniofacial relation among the subethnic Indian population: a modified approach - (Sagittal relation). *Indian J Dent Res.* 2012;23(3):305-12.
29. Rubika J, Felicita AS, Sivambiga V. Gonial angle as an indicator for the prediction of growth pattern. *World J Dent.* 2015;6(3):161-3.