

FREQUENCY OF CROSS BITE AMONG THE ORTHODONTIC PATIENTS IN KHYBER COLLEGE OF DENTISTRY

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ABSTRACT

Objective: To determine the occurrence of cross bites in patients seeking orthodontic treatment, and to study the extent to which it is prevalent in different types of malocclusions and its variation with gender.

Materials & Methods: Pretreatment study casts of 100 patients were evaluated among which 53 were female and 47 were male patients. Data was processed using the SPSS (17.0) software.

Results: Out of 100 cases, 21% had anterior cross bite and 34% had posterior cross bite. Cross bite was more in class III malocclusion cases.

Conclusion: Cross bite is more prevalent in females as compared to males and among the three different types of malocclusions, it was most prevalent in class III malocclusion cases.

Key words: Cross bite, frequency, malocclusion, transverse discrepancy.

INTRODUCTION

Posterior cross bite is the abnormal buccolingual relationship of the maxillary and mandibular posterior teeth in centric occlusion. One of the most common malocclusions in the deciduous and early mixed dentition is posterior cross bite with a prevalence of 8% to 22%.¹ According to a systematic review, the prevalence of unilateral posterior cross bite due to mandibular functional shift can range from 80% to 97% among different populations.² Posterior cross bite can be classified as unilateral or bilateral, considering the presence on either one or both sides of dental arch. Unilateral posterior cross bite is predominant and occurs in 80% of patients with transverse discrepancies.³ Unilateral functional cross bite occurs when the transverse discrepancies of the maxilla make the occlusal contacts in the centric relation unstable leading to a functional shift.

As opposed to this, in a true unilateral posterior cross bite, there is no functional jaw shift and cross bite is observed in both centric relation and centric occlusion. In growing patients, most cases of unilateral cross bite are due to constricted maxillary arch. Narrowing of the upper arch is usually symmetrical and the facial asymmetry is due to the lateral shift of the lower jaw, which may lead to remodeling of the temporomandibular joint impeding the normal growth of the mandible.^{3,4}

Anterior cross bite is divided on the basis of etiology and clinical presentation into three types; dento-alveolar cross bites, skeletal cross bites, and functional cross bites.⁵ Dento-alveolar anterior cross bites usually affects a single tooth. They have no underlying skeletal cause. Skeletal anterior cross bite includes underlying skeletal cause with either a deficient maxilla or mandibular excess. Pseudo class III malocclusion manifests itself as functional anterior cross bite.⁶

In a study by Santos et al, cross bites were seen in 28% children of school going age, with the highest numbers recorded in children aged 13 years (40%

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of the sample), followed by children aged 14 years (32%). Among these, 46% children had a unilateral cross bite, whilst 35% reported with anterior cross-bite.² Another study found that 10 to 13 year-olds had the greatest number of cross bites (around 6%), in comparison to 6-9 year-olds, who had around 5%.¹²

The presence or absence of a cross bite has a significant impact on treatment planning, thus it is important to know which type of dental malocclusion is more likely to present with an anterior or posterior cross-bite, so that the orthodontist is prepared pre-hand for this complex malocclusions. Despite this fact, there are no studies which address the prevalence and frequency of cross bites in patients visiting Khyber College of Dentistry. This study aims to determine the frequency of cross bites in different malocclusions, and it's relation to gender, under the assumption that it is not prevalent in angle class III malocclusion. This study will be of assistance in the diagnosis and treatment of cross bite.

MATERIALS & METHODS

The study was carried out on patients aged eight years and older, who reported to the Orthodontics and Dentofacial Orthopedics Department of Khyber College of Dentistry, Peshawar. The sample size was 100, among which 53 were female and 47 were males. 46 patients were class I, 38 class II and 16 class III. For the study, those casts were selected that were not physically damaged, nor did they have air bubbles or signs of abrasion on the occlusal surfaces. All dental casts were observed using a probe. The overjet was measured using a ruler. Cross bites were recorded with the patients' dentition in maximum intercuspation. This was ensured by comparing the casts to the intraoral photographic records of the patients. Anterior cross bite was noted when the maxillary incisors occluded lingual to the mandibular incisors in maximum intercuspation.¹ Posterior cross bite was recorded when the buccal cusp tips of the maxillary posterior teeth occluded on or lingual to the central fossa of the mandibular teeth.⁷

100 pretreatment study casts were consecutively selected of both gender with no history of previous treatment of orthodontics. Records of patients with syndromes, having extraction for any reasons of permanent teeth, history of trauma to the maxilla and mandibles, metabolic disorders and patients with previous orthodontic treatment were excluded.

100 pretreatment study casts were observed, irrespective of gender. Only those study casts were included that were undamaged and in an acceptable condition.^{2,3} these casts were assessed for the presence or absence of cross bites, following mentioned definition.

The findings were recorded in data sheets. A single researcher collected the data. Descriptive statistics was applied for the study variables. The frequency of anterior crossbite and posterior cross-bite among males and females was recorded and chi square test was applied to find the significance of difference. Prevalence of cross bites for the different molar relations was calculated and chi square test was applied to find the statistical significance. A p value of ≤ 0.05 was considered significant. Data was processed using the SPSS version 17.

RESULTS

The sample size included casts of 100 patients referred to the Khyber college of Dentistry, Orthodontics Department. Out of 100 patients included 53 females and 47 males. The ages varied from 8 to 33 years with mean of 17.5 ± 5.5 years. Out of 100 cases, the prevalence of anterior cross bite was 21% and that of posterior cross bite was 34%. Thus, Posterior cross bite was more prevalent than anterior cross bite. In female patients anterior cross bite was 13% and in males it was 8%. In female patients posterior cross bite was 25 % and in male patients it was 9%. Anterior and posterior cross bites in cases with different angle class malocclusion are shown in Table 1, 2 and 3 respectively. Anterior cross bite was found to be most common in class III, followed by class I, and no anterior cross bites were seen in class II malocclusion. And this difference was found to be highly statistically significant with a p value of 0.000.

Similarly, posterior cross bites most frequently occurred in class III, followed by class I, and were the least in class II malocclusion. This was found to be highly statistically significant with a p value of 0.000.

DISCUSSION

The orthodontic treatment time for posterior cross bite is determined in relation to its prevalence and distribution in different occlusal traits. However, there is wide variations in literature in the prevalence of posterior cross bite due to ethnic differences, techniques of registration, and sample sizes, age and

Table.1 Prevalence of cross bite among male and female

	No of male patients	Percentage of crossbites among males	No of female patients	Percentage of crossbites among females	P Value
Anterior Cross bite	47	8%	53	13%	0.004
Posterior Cross bite	47	9%	53	25%	0.001
Monthly Income	24689.92	12071.55			

Table. 2 Prevalence of anterior cross bite in different molar relations

	No of patients with the malocclusion	No of patients with ACB	Percentage of ACB	P value
Class I	46	9	19.5%	0.002
Class II	38	0	0%	
Class III	16	12	75%	

ACB: Anterior cross bite

Table. 3 Prevalence of Posterior cross bite in different molar relation

	No of patients with the malocclusion	No of patients with PCB	Percentage of PCB	P value
Class I	46	16	34.8%	0.001
Class II	38	4	10.5%	
Class III	16	14	87.5%	

PCB: Posterior cross bite

different stages of the patient’s dentition.⁸

Keeping in view the influence of cross bite on treatment planning, this study was carried out to find the frequency of cross bite in a sample consisting of orthodontic patients. The occurrence of this malocclusion was 47% in males, compared to 53% in females. This shows more awareness in females than males regarding their malocclusion, thus they are more likely to report to the orthodontist. It may also be due to their higher number in this study. This is in line with the results of previous studies.⁹

Regarding anterior cross bites, prevalence among females was 13% and males 8 %.

Posterior cross bite was 25 % in female and 9% in male patients. Similar results were reported by Naeem et al, who showed that cross bite occurred in 6 out of the 38 male patients, (prevalence of 16%) and 18 of the 62 female patients (prevalence of 29 %).¹⁰

Out of 100 cases 34% had posterior cross bite, according to previous studies the prevalence of cross bite is 8% and 22 %.^{1,11} As this study included single tooth cross bites as well, and the sample was

composed of orthodontic patients, rather than the normal population, therefore, there was an increased prevalence of cross bite in this study.¹¹ The increased incidence of cross bite in females may be due to their increased number in this study. According to a Brazilian study, 28% of school going children were reported to have a cross bite. The prevalence was highest among 13 and 14-year-olds. Prevalence of unilateral cross bite was 46% and of anterior cross bite was 34%.² Whereas a prevalence of 7-10% in children with mixed dentition has been reported in another study.⁶ A prevalence of 5.5% have been reported in Iraq population.¹² Kahraman Gungor et al. reported that in in the permanent dentition there is highest frequency of posterior cross bite, (51.0%, 47.3%, and 53.6%) both unilaterally and bilaterally both on right and left side. Our results are in accordance with the findings reported earlier.¹³

CONCLUSION

1. Cross bite is more prevalent in females, which may be due to their higher number in the study, as females are more concerned about their malocclusion.

2. The prevalence of both types of cross bites is higher in class III malocclusion.
3. Anterior cross bites do not occur in class II malocclusion.

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