

Lateral Open Bite: Frequency and Distribution

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ABSTRACT:

Objective: This study was designed to determine the frequency of lateral open bite and its gender distribution among the patients visiting Orthodontics department of de'Montmorency College of Dentistry, Lahore.

Methodology: This cross sectional study was carried out at department of Orthodontics, de'Montmorency College of dentistry, Lahore, where orthodontic records of 200 patients were included to find out frequency of lateral open bite (LOB). The amount of LOB was confirmed by measuring vertical distance between cusp tips of posterior teeth affected by lateral open bite, with standardized digital vernier calipers on plaster models.

Results: 200 patients were included (98 boys, mean age: 19.3 ±1.3 years; 102 girls, mean age: 19.0 ± 1.5 years) The frequency of lateral open bite was found to be 1 %. Male to female ratio was 1:1.

Conclusion: It was concluded that male and female were equally affected by lateral open bite and frequency was found out to be 1 %.

Keywords: Lateral open bite, Open bite, Posterior open bite

INTRODUCTION:

Open bite is a lack of vertical overlapping between the teeth in maxillary and mandibular arches when teeth are in maximum intercuspation¹. Open bite malocclusion is multifactorial in nature, usually caused by interaction of genetic and environmental factors.^{2,3} Lateral open bite (LOB) is a lack of vertical overlapping between the maxillary and mandibular posterior teeth i.e. premolars and or molars, when teeth are in maximum intercuspation. It can be classified as dental or skeletal, and unilateral or bilateral.

Several causes of lateral open bite have been presented in literature, namely, temporomandibular disorders, lack of molar eruption, occlusal plane issues, impacted primary molar and primary failure of eruption^{4,13}. There are two possible theories regarding lateral open bite: 1. mechanical hindrance to tooth eruption, either before or after it emerges from the alveolar bone, or 2. Flaw in the eruptive mechanism of the tooth leading to the failure of the expected amount of eruption to occur.

Mechanical hindrance with eruption may be due to ankylosis of the tooth to the alveolar bone, which can happen spontaneously or as a result of injury, or by obstruction in the path of the erupting tooth. Supernumerary teeth and non-resorbing deciduous tooth roots or alveolar bone are examples of such obstacles. After the tooth comes out from the bone, pressure from the adjacent soft tissues between the teeth such as, cheek, tongue, or finger can obstruct the eruption. Ankylosed teeth are commonly in infraocclusion and are said to be submerged. The most frequently submerged tooth is retained lower deciduous second molar. The second possible cause of eruption failure is a disturbance of the eruption mechanism itself⁴.

Skeletal open bite is characterized by small anterior cranial base length, increased cranial base angle, steep mandibular plane angle and increased lower anterior face height along with increased inter-labial gap. Dental open bite is characterized by deficient dentoalveolar heights, divergent planes, mesially inclined molars and flat curve of spee in mandibular arch. Severity grades of open bite are characterized as: Moderate (0-2 mm), Severe (3-4 mm) and Extreme (more than 4 mm)¹⁵.

The prevalence of anterior open bite varies from 2% to 12% and differs between ethnic groups and, in different age and sex¹⁶. Frequency of LOB in different populations varies; so rationale of this study was to determine the frequency of LOB in our population, as it is the key to determine epidemiological data on all types of malocclusion, in order to find out the population's orthodontic treatment needs, the budget required and preventive steps.

METHODOLOGY:

This cross sectional study was conducted from 1st May 2016 to 1st June 2017 after institutional approval at the Orthodontics Department of de'Montmorency College of Dentistry, Lahore. Orthodontic records of 200 untreated patients, between ages of 18 and 25 years were evaluated to find out the frequency of lateral open bite.

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Inclusion Criteria:

Presence of all teeth except wisdom; Patients with chronological ages between 18 and 25 years; Well maintained Pre-treatment records.

Exclusion Criteria:

History of trauma; Craniofacial disorders; Any systemic or metabolic disease.

Data Collection Procedure:

The amount of LOB was confirmed by measuring vertical distance between cusp tips of posterior teeth affected by lateral open bite, with standardized digital vernier calipers on plaster models. Dental history sheets were used to rule out any systemic disease and history of dental trauma. The mean age, gender distribution and percentage of LOB among the selected sample was analysed using Statistical Package for the Social Sciences software package (SPSS) 19.

RESULTS:

200 patients were included (98 boys, mean age: 19.3 ± 1.3 years; 102 girls, mean age: 19.0 ± 1.5 years). The frequency of lateral open bite was found to be 1%. Male to female ratio was 1:1 (Table-1).

Table: 1
Frequency of LOB among patients visiting De’
Montmorency College of dentistry, Lahore
(N=200)

Parameter	Frequency
LOB Patients	2 (1 %)
Males having LOB	1 (50 %)
Females having LOB	1 (50 %)

DISCUSSION:

Lateral open bite is very rare, especially in adults. Causative factors commonly reported in literature include abnormalities in dental eruption, vertical maxillary excess, skeletal pattern, and tongue-thrust problems. The mechanical treatment modalities are limited in the adults. Orthognathic surgery is recommended in adult patients with severe open bite and unesthetic facial proportions. For less severe problems, effective treatment options are being searched for. Identifying the cause of posterior open bite is essential clinically, because prognosis of orthodontic treatment is determined by it¹⁷. The male to female ratio was 1:1 in this study. This was in accordance to the findings of certain other studies on anterior open bite, where no gender differences were found^{18,19}. Frequency of open bite in the present study was found out to be 1%, which was in agreement with Cabrera et al, who concluded that prevalence of lateral open bite was low²⁰. Lateral open bite in some patients is due to disruption in the eruption mechanism, so that non-ankylosed teeth stop to erupt⁹. Lateral open-bite cases reported in the literature mostly involved ankylosed teeth or there was primary failure of eruption^{9,17,21-25}. To understand the probable causes of lateral open-bite, the vertical equilibrium of forces on the teeth should be

considered. Each tooth is subjected to a set of forces which are applied to its occlusal surface after it emerges into the oral cavity, and they try to push the tooth back into its socket. These forces are opposed by the periodontal ligaments, alveolar bone, and the dentofacial structures. It is therefore obvious that an open-bite between posterior teeth could develop in a growing child either from increased forces applied against the occlusal surface, for example, from tongue or cheek interjected between the teeth, or from reduced normal eruption in the presence of normal occlusal loadings. It is important for orthodontists to realize that in some patients the actual problem is a failure of the eruption mechanism, and not some habit through which the patient is preventing normal eruption^{14,17}. Patients with lateral open bite due to mechanical interference of tooth eruption and unilateral posterior crossbite can be successfully treated with fixed appliances and intermaxillary elastics. Myofunctional therapy is necessary to enhance the stability of the open-bite correction²⁰.

In both of our diagnosed patients with LOB, cause was found to be ankylosis of lower deciduous second molar with congenitally missing lower second premolar. Further large scale studies are recommended to establish the prevalence in our population; this would help in more appropriate management of the LOB malocclusion.

CONCLUSION:

Lateral open bite is equally prevalent among females and males. Frequency of LOB was found out to be 1%.

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