

## Comparison of Missing Permanent Tooth in Bangladeshi Unilateral Cleft Lip and Palate to those without Cleft Lip and Palate

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### Abstract

**Background:** The distribution of dental abnormalities specially missing tooth is common among the cleft palate & lip patient wherefore the aim of this study was to evaluate the prevalence of hypodontia in case of Bangladeshi cleft population. **Objective:** The purpose of the present study was to compare the congenital tooth deficiencies seen in permanent dentition in individuals with unilateral cleft lip and palate (UCLP) to non-cleft individuals with Angle Class I malocclusion. **Methodology:** This is a retrospective case control study between UCLP and Angle Class I malocclusion patients. This study was done on OPG films taken before treatment from 80 patients who applied for orthodontic treatment. 40 individuals with UCLP between the ages of 12 - 16 years were compared with the 40 individuals with Angle Class I malocclusion with no CLP aged between 12 - 16 years. Individuals with UCLP; 21 clefts were on the left side and 19 clefts were on the right side. The congenitally deficient teeth were recorded from the OPG films. In this study, third molars were not included in the evaluation. **Results:** In this study, no differences were found in regard to the gender of the patient. The left side of the patients was affected substantially more than the right side. The frequency of the missing upper lateral incisors in the cleft side of the patients was significantly higher than the non-cleft side. Therapists of cleft patients need to be aware of the high variety of numerical alterations, as this is important for therapy planning and the applied treatment. **Conclusion:** The management of dental anomalies, which can easily be detected by careful inspection of routine orthodontic diagnostic records, should be taken into consideration in treatment planning of individuals with a cleft. [Journal of National Institute of Neurosciences Bangladesh, July 2022;8(2):198-201]

**Keywords:** Cleft lip and palate; cleft sidedness; missing teeth; maxillary lateral incisor

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### Introduction

Cleft lip and/or palate (CLP) is the most common congenital human malformations. The cleft lip and/or palate constitute approximately 65.0% of all congenital

craniofacial anomalies. The frequency of cleft is higher in Asian people than in other races<sup>1</sup>. The cleft lip and palate affects 9.3/10,000 in Indian subcontinent<sup>2</sup>. The etiology of dental anomalies in cleft patients was not

fully recognized, but for some investigation it is believed that a genetic factor plays the main role. Among others, the gene candidates underlying the occurrence of clefts and congenital defects are MSX1, PAX9, IRF6<sup>3</sup>. There are some risk factors which might be important in cleft lip and palate such as maternal exposure to tobacco smoke, alcohol, poor nutrition, viral infection, medicinal drugs, and teratogens in the workplace and at home in early pregnancy. Parental exposure to occupational chemicals may be associated with oro-facial cleft development. Use of some drugs like anticonvulsant drugs, notably diazepam, phenytoin, and phenobarbital and corticosteroid by mothers in pregnancy increase risk of these anomalies<sup>4</sup>. Environmental factors, such as medications, malnutrition, toxins, and hormonal disorders are reported. Interactions between these factors lead to the failure of fusion of the medial nasal process and maxillary process in the 6<sup>th</sup> week of intrauterine life<sup>5</sup>. Maternal age and consanguine marriage are might be others causes of cleft lip and palate<sup>6</sup>.

Dental anomalies are frequently seen in individuals with CLP. The severity of the cleft also determines the direction and size of the development of teeth and occlusion. Generally, both deciduous and permanent dentitions are affected, but in permanent dentition, these anomalies occur at a higher rate<sup>7</sup>. Tooth agenesis, also known as hypodontia or congenital absence of teeth, is the most frequently observed developmental anomaly of the human dentition. The prevalence of congenitally missing teeth in the general population has been reported within a range of 0.027 to 10.1%, which varies greatly according to geographic location and race<sup>8</sup>.

When compared with the general population, subjects with CLP have always been found to have a higher prevalence of dental anomalies, such as variations in tooth number and position, and reduced tooth dimensions, most of which are localized in the area of the cleft defect<sup>9</sup>. The frequency of patients with congenitally missing teeth is 1.6 to 9.6%, as reported by Graber<sup>10</sup>. In children with CLP, in both deciduous and permanent dentition, upper lateral incisors were reported to be the most commonly missing teeth in the cleft region and the upper second premolars were reported to be more frequently deficient than the normal population. Congenitally absent teeth were seen more unilaterally than the bilaterally, but in second premolar teeth; the bilateral absence was found 1.5 times more often than unilateral absence. [11] The aim of this study was to compare the congenital tooth deficiencies seen in permanent teeth in patients with UCLP with individuals without CLP in Bangladesh.

## Methodology

The selected patients with cleft lip and palate enrolled at the Comprehensive Cleft and Craniofacial Center, SHNIBPS and Sapporo Dental College and Hospital, Bangladesh, between 2018 and 2022. This study was done on OPG films taken before treatment from 80 patients who applied for orthodontic treatment. 40 individuals with UCLP between the ages of 12 to 16 years were compared with the 40 individuals with Angle Class I malocclusion with no CLP aged between 12 to 16 years. In the patients with UCLP; 21 of them have cleft on the left side while 19 of them have cleft on the right side. The congenitally deficient teeth were recorded from the OPG films. In this study, third molars were not included in the evaluation. Patients with UCLP aged between 12 to 16 years and patients with Angle Class I malocclusion with no CLP aged between 12 to 16 years and patients who had no syndromes, no extraction of permanent teeth, no endodontic or prosthodontics or orthodontic treatment, and no trauma to any tooth before the initiation of orthodontic treatment were included in this study. Patients with UCLP not aged between 12 to 16 years and patients with Angle Class I malocclusion with no CLP not aged between 12 to 16 years or patients who had craniofacial syndromic cleft lip and palate, extraction of permanent teeth, endodontic or prosthodontics or orthodontic treatment, and trauma to the tooth before the initiation of orthodontic treatment were excluded from this study. The patients' population was racially and ethnically similar. The types of UCLP included both complete and incomplete primary cleft palates. Panoramic radiographs of the patients were used to determine the presence or absence of the teeth.

## Results

In this study, among 80 patients, 40 was control group and 40 was CLP patients. Therefore, a total of 40 patients with cleft lip and palate: 22 were boys (55%) and 18 were girls (45%). When the relationship between gender and side of the cleft was analyzed, no relationship was found ( $p = 0.493$ ). (Table 1).

Table 1: Distribution of Gender and Relationship between Gender And The Affected Side

Unilateral Cleft Lip and Cleft Palate	Boy	Girl
Right side	12	7
Left side	10	11
Percent	55.0	45.0
P value	0.493	

Regarding the distribution of cleft sites, 19 patients (47.5%) present with a cleft on the right side, while 21 patients present with a cleft (52.5%) on the left side (Table 2)

Table 2: Site distribution of cleft lip and palate. Patients with unilateral cleft lip and palate is subdivided into right and left side

Site Distribution	Frequency	Percent (%)
Right side	19	47.5
Left side	21	52.5
Total number	40	100

In patients with UCLP; there is congenital lateral incisor deficiency at the rate of 84% in the cleft region, 8% on the non-cleft side and 8% in the control group (Figure I).

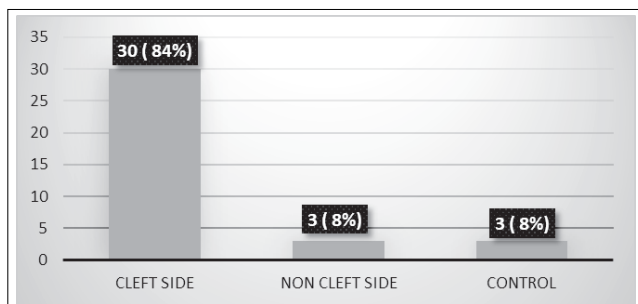


Figure I: Congenital Deficiency Of Upper Lateral Incisor in UCLP (left side/non-cleft side) and Control group.

Patients with UCLP compared to the control group; congenital deficiency of upper lateral incisor was seen more in the cleft group (Figure II).

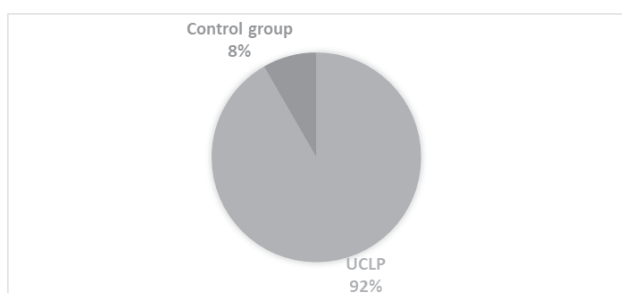


Figure II: Congenital deficiency of upper lateral incisor in UCLP and Control group

Congenital deficiency of the lateral incisor in patients with UCLP; It was found more in the cleft region (90%) than the non-cleft side (9%) (Figure III).

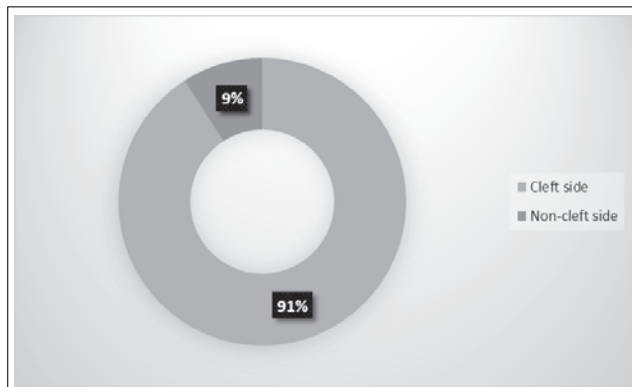


Figure III: Congenital deficiency of upper lateral incisor of UCLP in cleft side and in non-cleft side

If we only consider UCLP of cleft group, there is 75.0% patients shows congenital missing teeth and 25% of them shows no congenital missing teeth. (Figure IV)

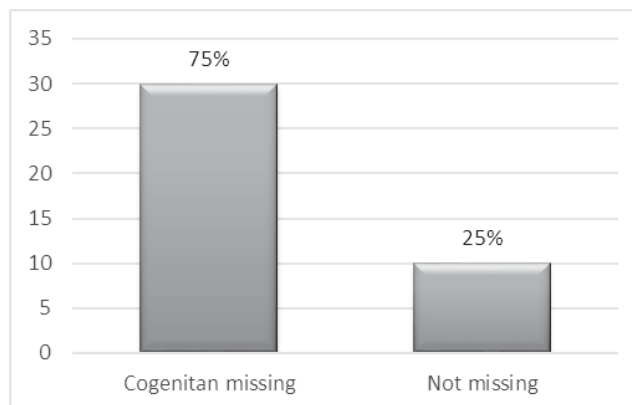


Figure IV: Congenital deficiency of upper lateral incisor only in cleft patients group of UCLP

**Discussion**

Patients with cleft lip and palate are often affected by various dental anomalies, such as tooth agenesis, supernumerary teeth, microdontia, taurodontism, dilaceration, ectopic eruption, impacted teeth and late dental development. Among these, hypodontia is the most common one. In our investigation, 75.0% of the cleft patients analyzed, had congenital missing teeth. This is just a little more than the 62.0% to 73.0% reported in comparable studies<sup>12</sup>. However, in the literature, for the lateral incisor, there are also reports on a prevalence of hypodontia in cleft patients ranging in between 35.0% and 45.0% cases<sup>13</sup>. These differences might be influenced by the composition of the cleft population analyzed or the relatively small sample size of the groups studied. On the one hand, the order of the prevalence of absent teeth from highest to lowest,

starting with the lateral upper incisor, followed by the upper second premolar and the lower second premolar, equates to those found in other studies<sup>14</sup>.

The prevalence of dental anomalies has been found to vary among different racial/ethnic groups. The most common missing teeth in UCLP, in the present study, and in a large group of BCLP are the lateral incisors in the cleft quadrant and the maxillary and mandibular second premolars. The term “patterns” of tooth agenesis in UCLP patients is often used in the dental literature. These patterns mostly referred to maxillary laterals incisors and/or maxillary first and second premolars.

No relationship was found between dental anomalies and gender in the present investigation. This is in agreement with the findings of Ribeiro et al<sup>15</sup>. Cleft lip and palate are known to be more common in boys. In Korean cleft patients, the ratios of boys also shows higher<sup>16</sup>. Bartzela et al<sup>17</sup> found that left-side clefts were more common than right-side clefts, and the rate of tooth agenesis was greater on the left side of the maxilla. Dewinter et al. reported that for patients with a UCLP, the left side is more affected than the right side. . This is similar to the findings of the current study<sup>18</sup>.

It has previously been reported that dental anomalies occur with a higher frequency on the cleft side in patients with a UCLP. It has been suggested that the high rate of agenesis near the cleft may be due to a deficiency in blood supply, either congenital or secondary to surgery, or to a deficiency in the mesenchymal mass<sup>19</sup>.

### Conclusion

In this study, no differences were found in regard to the gender of the patient. The left side of the patients was affected substantially more than the right side. The frequency of the missing upper lateral incisors in the cleft side of the patients was significantly higher than the non-cleft side. Therapists of cleft patients need to be aware of the high variety of numerical alterations, as this is important for therapy planning and the applied treatment. The management of dental anomalies, which can easily be detected by careful inspection of routine orthodontic diagnostic records, should be taken into consideration in treatment planning of individuals with a cleft.

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