

Dental Anomalies in Children with Cleft Lip and Palate at a Tertiary Care Hospital

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ABSTRACT

Objective: To determine the dental anomalies in children with cleft lip and palate at a tertiary care hospital.

Design of the Study: descriptive cross-sectional.

Study Settings: Study was conducted at conducted in the OPD of Dentistry at Abbottabad International Medical Institute between the months of January 2021 to June 2021.

Material and Methods: The convenience sampling strategy was used to obtain the 208 radiographs of patients with cleft lip and/or palate for Data A. In order to conduct the study, the Institutional Review Board granted its approval. Radiographs were examined for suspected dental defects and demographic information was gathered.

Results of the Study: A total of 76 (38 in group A and B) patients were included. Mean age in groups A and B was 39.25±3.91 and 38.71±4.01. Out of 38 patients in group A and B, effectiveness of large antecubital vein versus small vein on dorsum of hand in prevention of propofol injection was 81.6% vs. 36.87%.

Conclusion: A high rate of dental abnormalities has been found in patients who have had a cleft lip or palate. The most common aberration in the study was tooth agenesis, with the lateral incisor having the highest rate of agenesis.

Keywords: Dental Anomalies, Panoramic Radiograph, Cleft Lip and Palate

INTRODUCTION

Cleft lip and palate is one of the most common birth disorders, accounting for a considerable percentage of all birth defects. In children with CL/P, dental abnormality is a big problem.¹ It's possible that the cleft is too severe or the corrective surgery was done too early, causing problems with appearance, mastication, and speech.²⁻³ The association between dental abnormalities and CL/P may be explained by their tight embryological relationship in timing and physical position of tooth germs.⁴ As a result of the CL/P, the maxillary and medial nasal processes are not fused together. This leads in numerous dental abnormalities and extra teeth.⁵

Some research suggests that a hereditary factor is the primary cause of dental malformations in people with cleft palates. MSX1, PAX9, and IRF6 are a few of the gene candidates thought to be responsible for clefts and other congenital abnormalities.⁶ At the time of cleft formation, local mechanical conditions can be correlated with the occurrence of dental abnormalities.^{7,8}

In addition, the impact of medical operations is dwelt on. Patients with bilateral CLP had the highest incidence of relative risk of dental malformations, followed by those with LCLP, according to a new study.^{9,10} We cannot stress enough the importance of comprehensive, multidisciplinary care for children with oral clefts. A crucial step in the procedure is orthodontics, which is both time-consuming and challenging.¹¹ It is difficult, time consuming, and costly to correct co-occurring dental abnormalities. This shows that the cleft abnormality is both a personal and societal problem.¹²

MATERIAL AND METHODS

After ethical clearance this descriptive cross-sectional study was conducted in the OPD of Dentistry at Abbottabad International Medical Institute between the months of January 2021 to June 2021. Dentistry Department, Abbottabad International Medical Institute All patients who had cleft lip and palate surgery and arrived with a residual alveolar cleft or orthodontic therapy previous to the trial were included in this study. OPG radiographs of syndromic patients, on the other hand, were not considered.

Based on the number of cleft lip and palate patients who attend Kirtipur Hospital each year, the sample size was determined to be 208. The data were gathered using the convenience

sampling technique. There were 208 patients in the research who had already undergone surgery for cleft lip and palate.

Information on dental anomalies such as missing teeth, in shapes morphological anomalies, supernumerary teeth presence, and anomalies according to position such as mal-aligned teeth, ectopic eruption was gathered from panoramic radiographs. A single imaging centre was used to capture all Panoramic radiographs to ensure consistency. On a computer monitor, the digital panoramic radiographs were evaluated.

Data was entered and analyzed through SPSS version 22. Mean ± standard deviation was computed for numerical variables like age, height, weight, pain score and BMI. Frequencies and percentages were calculated for gender, residential status, ASA status, smoking status, comorbidities like DM and hypertension, pain severity and Effectiveness. Chi X² test was applied to compare prevention of pain between groups, taking P-value less than or equal to 0.01 as significant.

STUDY RESULTS

Comparison between the laterality of cleft in the study group based on the type of cleft is was found that predominantly 66% (33) subjects with unilateral cleft lip and palate and remaining subjects 34% (17) with bilateral cleft lip and palate is given in Table 1. Comparison in the developmental disturbance in number of teeth among the CLP children and found that in 3 subjects (6%) Central incisors were missing, 41 subjects were seen missing Laterals incisors which is around 82% of the study population, 2 subjects (4%) missing canines and 3(6%) and 5(10%) subjects with the missing 1st and 2nd premolar is given in Table 2.

Table 4 showed the gender wise evaluation among CLP subjects, it was found that out of 3 subjects with missing central incisors 2 subjects were male and 1 subject was female. Out of 41 subjects with missing lateral incisor 23 subjects was male and remaining 18 subjects were female. Out of 2 subjects with missing canines both the subjects belong to the male group, missing 1st premolar out of 3 subjects 2 subjects were male and 1 subject was a female and out of 5 subjects with missing 2nd premolar 3 subjects were male and 2 subjects were female. Thus, the prevalence of missing central incisors, lateral incisors, canines and premolars was seen more in males as compared to females.

Table 3 and graph 3 showed the prevalence of developmental disturbances in number of teeth based on the

laterality it is found that out of 3 subjects missing central incisor 1(3%) subject belong to the UCLP group and 2 (11.8%) subject belong to the BCLP group, out of 41 subjects with lateral incisor 25(75.8%) subjects belong to UCLP group and 16 (94.1%) belong to the BCLP group. With missing canine the 2 subjects (11.8%) was seen in the BCLP group, out of 3 subjects with missing 1st premolar 1 subject (3%) was seen in the UCLP group and 2 subject (11.8%) was seen in the BCLP group and missing 2nd premolars out of the 5 subjects 1 subject (3%) belong to the UCLP group while the remaining 4 subject (23.5%) belong to BCLP group. Thus, missing teeth (central incisors, lateral incisors, canine and premolars) was seen

Table 1: Distribution of Laterality of Cleft among Cleft lip & Palate patients

| Variable | Category | N | % |
|----------|------------|----|-----|
| Cleft | Unilateral | 33 | 66% |
| | Bilateral | 17 | 34% |

Table 2: Distribution of developmental disturbance in number of teeth among CLP subjects

| Variable | Category | n | % |
|-------------------------|----------|----|-------|
| Missing Central Incisor | Yes | 3 | 6.0% |
| | No | 47 | 94.0% |
| Missing Lateral Incisor | Yes | 41 | 82.0% |
| | No | 9 | 18.0% |
| Missing Canine | Yes | 2 | 4.0% |
| | No | 48 | 96.0% |
| Missing 1st Premolar | Yes | 3 | 6.0% |
| | No | 47 | 94.0% |
| Missing 2nd Premolar | Yes | 5 | 10.0% |
| | No | 45 | 90.0% |

Table 3: Comparison of the prevalence of developmental disturbance in number of teeth based on the laterality of cleft in CLP group using Chi square Test

| Missing Teeth | Category | Unilateral | Bilateral | P-Value |
|-----------------|----------|------------|-----------|---------|
| Central Incisor | Yes | 1(3.0%) | 2(11.8%) | 0.22 |
| | No | 32(97.0%) | 15(88.2%) | |
| Lateral Incisor | Yes | 25(75.8%) | 16(94.1%) | 0.11 |
| | No | 8(24.2%) | 1(5.9%) | |
| Canine | Yes | 0(0.0%) | 2(11.8%) | 0.04* |
| | No | 33(100.0%) | 15(88.2%) | |
| 1st Premolar | Yes | 1(3.0%) | 2(11.8%) | 0.22 |
| | No | 32(97.0%) | 15(88.2%) | |
| 2nd Premolar | Yes | 1(3.0%) | 4(23.5%) | 0.02* |
| | No | 32(97.0%) | 13(76.5%) | |

Table 4: Gender wise comparison of prevalence of developmental disturbance in number of teeth among CLP group using Chi square Test

| Missing Teeth | Category | Males % | Females % | P-Value |
|-----------------|----------|-----------|------------|---------|
| Central Incisor | Yes | 2(7.1%) | 1(4.5%) | 0.70 |
| | No | 26(92.9%) | 21(95.5%) | |
| Lateral Incisor | Yes | 23(82.1%) | 18(81.8%) | 0.98 |
| | No | 5(17.9%) | 4(18.2%) | |
| Canine | Yes | 2(7.1%) | 0(0.0%) | 0.20 |
| | No | 26(92.9%) | 22(100.0%) | |
| 1st Premolar | Yes | 2(7.1%) | 1(4.5%) | 0.70 |
| | No | 26(92.9%) | 21(95.5%) | |
| 2nd Premolar | Yes | 3(10.7%) | 2(9.1%) | 0.85 |
| | No | 25(89.3%) | 20(90.9%) | |

DISCUSSION

Dentofacial malformations can be inherited or caused by exposure to the environment. Dental malformations are in cleft palate children than the general population, study shows.¹³The present study evaluated these parameters in children with cleft lip and palate for better sensitivity and specificity and hence it was carried out among 50 children having cleft lip and palate patients.

The present study showed that the rate of percentage of children with missing maxillary permanent lateral incisors was found to be 82% in UCLP (75.8%) and BCLP (94.1%) respectively. Matteo Camporesi et al (2010) conducted a study to evaluate missing premolars, in the study no statistical difference for

premolar aplasia in UCLP as compared to the NCLP group.¹⁴ Hypodontia is largely inherited through autosomal dominant inheritance.¹⁵

UCLP and BCLP were compared in terms of the prevalence of congenitally missing teeth, according to a study by Matteo Camporesi et al. (2010). Congenital maxillary lateral incisor absence was more common in BCLP than in UCLP.¹⁴ As a result, it supports the findings of the current investigation, which found that BCLP individuals were more likely to have missing maxillary lateral incisors. In this study, Ribeiro et al. and Rose found no significant difference in the occurrence of second premolar aplasia between the UCLP and BCLP groups.¹⁶ In the present study, missing of second premolar was found in BCLP subject with 23.5%, however these prevalence of developmental disturbance in number of teeth based on the laterality of cleft is not statistically significant.

Ranta's research¹⁷ According to Shapira et al.¹⁸, girls are more likely than males to suffer from hypodontia, however other research, such as Da Silva et al.¹⁹ and Goya et al.²⁰, claim that there is no gender difference in the occurrence of hypodontia. For all participants with UCLP and BCLP, there was no difference in prevalence of hypodontia between the sexes in this study.

According to Peterka et al.²¹, the same elements that lead to cleft formation also cause the root development delay. According to Ranta,²² surgery around the cleft side, nutritional problems, and the lack of bone support have all been cited as possible reasons for the delay in treatment.

Before beginning rapid maxillary expansion or scheduling ortho-surgical operations, it's critical to monitor a patient's maturation in particular orthodontic protocols like myofunctional therapy. Because chronological age alone cannot reveal a person's true health status, we can turn to radiographs of canine calcification stages, which are more readily available and less expensive to get than X-rays of the hands and wrists.

CONCLUSION

In both UCLP (unilateral) and BCLP (bilateral) patients the most common anomaly was hypodontia of lateral incisors followed by 2nd premolars. Root development of the permanent canine show a slight delay on the cleft side. However, no statistically significant difference was seen on comparing the dental age between the cleft and the control subjects

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