

FREQUENCY OF CLEFT LIP AND PALATE AND ASSOCIATED DENTAL ANOMALIES AT ISLAMIC INTERNATIONAL DENTAL HOSPITAL, ISLAMABAD

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ABSTRACT

The purpose of this study was to determine the frequency of cleft lip and palate (CL&P) patients and their associated dental anomalies in orthodontics department. The data were retrieved from file records of orthodontics department at Islamic International Dental Hospital, Islamabad (IIDH). All the cleft patients were included in this study who visited orthodontics department, IIDH during the year 2009. The records included history and examination, radiographs (lateral cephalogram, Orthopantomogram, Upper occlusal), Study casts, Photographs (intra oral and extra oral) of the patients. Sixteen patients (10 females, 6 males) were included, 43.8% had left unilateral CL&P and 56.3% had bilateral CL&P. 43.8% had bilateral impacted maxillary canine, 31.3 showed left while 12.5% showed right side impaction. 75% had erupted maxillary lateral incisor. 31.3% had palatal fistula. One patient had a supernumerary tooth. More anterior crowding (75%; n=12) was evident. Crossbites were evident in both anterior (56.3%; n=9) and posterior (68.8%; n=11) segments. Maxillary deciduous canine was retained in 75% of cases. Short lip was also a common finding (75%; n=12). Associated dental anomalies are very common in patients with cleft lip and palate though frequency varies with the cleft type.

Key words: Cleft Lip and Palate, Cleft Lip, Cleft Palate, Dental Anomalies

INTRODUCTION

Cleft of the lip and palate are the most common congenital facial deformities.^{1, 2} Clefts may vary in severity from minor notching of the lip or bifid uvula to complete unilateral or bilateral cleft of the lip and palate.³ Clefts of the lip and palate are generally divided into two groups, isolated cleft palate and cleft lip with or without cleft palate, representing a heterogeneous group of disorders affecting the lips and oral cavity. These defects arise in about 1.7 per 1000 live born babies, with ethnic and geographic variation.⁴

Patients with cleft lip and palate (CL&P) present with multitude of problems like functional impairment and esthetic compromise. Functions such as suckling and swallowing, speech and hearing may be impaired while facial disfigurement and malocclusion are usually present.⁵ Thus may have psycho-social problems

and can lead to long lasting adverse outcomes for health and social integration.⁶

A CL&P may be genetic in origin, as an associated anomaly in syndrome like Van der Wound Syndrome, Apert Syndrome and Seckel Syndrome etc or associated with teratogen, a drug given during pregnancy that may cause birth defect, or may be associated with a medical condition. In an Isolated cleft etiology is more difficult to determine but there is general consensus that hereditary is the most significant cause of clefts.⁵ Complete cleft lip and palate are more common in males than females. Unilateral cleft lip is more common on left side.⁷

Oral clefts result from partial or complete lack of fusion of the maxillary prominence with the median nasal prominence on one or both sides anterior to the incisive foramen and / or result from failure of the

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palatine shelves to fuse posterior to the incisive foramen. Whereas, cleft lip is due to failure of mesodermal cells in the area of lip derived from the ectoderm of neural crest cells.⁸

METHODOLOGY

In this cross-sectional study, the data were retrieved from file records of orthodontics department at Islamic International Dental Hospital, Islamabad (IIDH). All the cleft patients were included in this study who visited orthodontics department, IIDH during the year 2009.

The author examined history and examination cards, radiographs (lateral cephalogram, Orthopantomogram, Upper occlusal), Study casts, Photographs (intra oral and extra oral) of the patients. Following attributes of skeletal, dental and soft tissue were scanned.

- A. Cleft type *
- B. Palatal fistulas**
- C. Impacted maxillary canines
- D. Missing maxillary lateral incisors
- E. Number of supernumerary teeth present
- F. Retained maxillary deciduous canine
- G. Anterior crowding
- H. Posterior crowding
- I. Anterior crossbite
- J. Posterior crossbite
- K. Short lip***

* cleft lip, cleft palate, right /left cleft lip and palate, and bilateral cleft lip and palate
 ** upper occlusal photographs were used for evaluating palatal fistula
 *** Lip length shorter than 19 mm taken from base of the nose to upper lip vermilion border

RESULTS

Of the total 16 patients, 10 were females and 6 were males, with mean age 15.63 ± 4.657 years. Seven patients had left unilateral cleft lip and palate (43.8%) while, nine had bilateral cleft lip and palate (56.3%) (Figure 1). 43.8% had bilateral impacted maxillary canine (n=7), in patients with unilateral impacted

maxillary canine, 31.3% had left impacted maxillary canine (n=5) and 12.5% had right impacted maxillary canine (n=2). 12.5% of patients had no impacted maxillary canine (n=2) (Figure 2). 75% patients had erupted maxillary lateral incisors (n=12). 18.8% had both maxillary lateral incisors missing (n=3). 6.3% cases had right missing maxillary lateral incisor that depended on extent of missing tissue in the cleft region. 31.3% had palatal fistula (n=5) (Figure 9). Only one patient

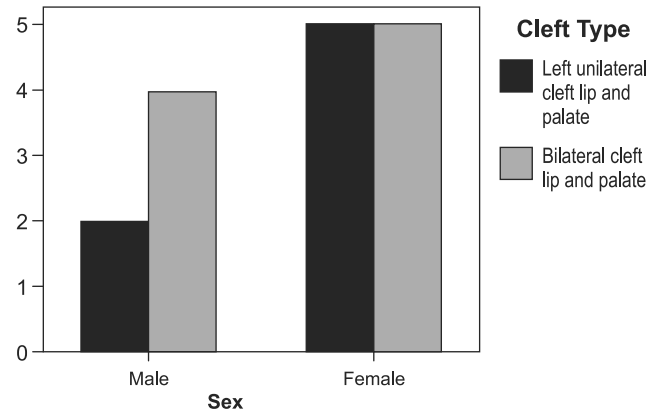


Fig 1: Cleft Type

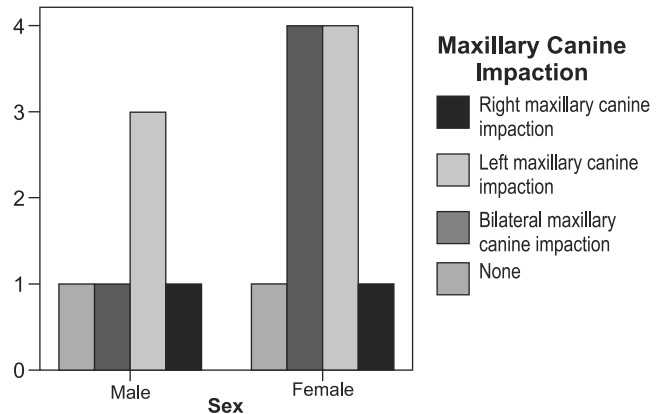


Fig 2: Maxillary canine Impaction

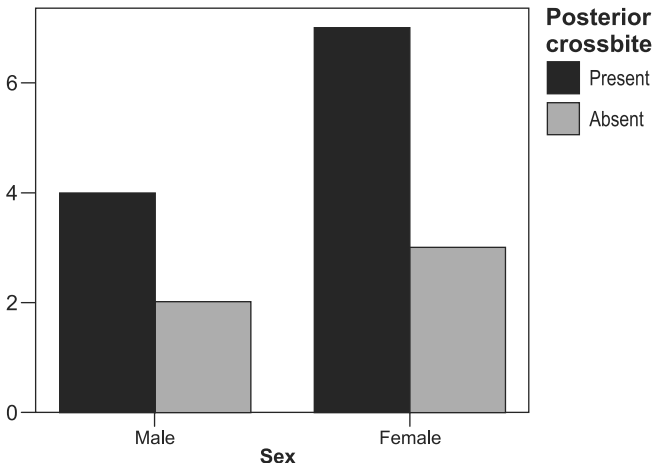


Fig 3: Posterior crossbite

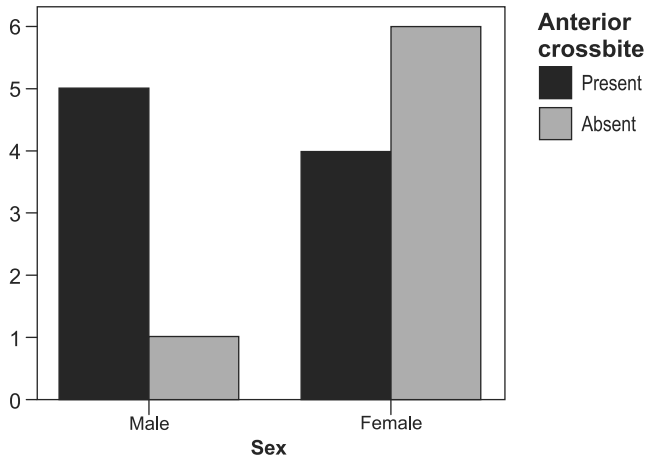


Fig 4: Anterior crossbite

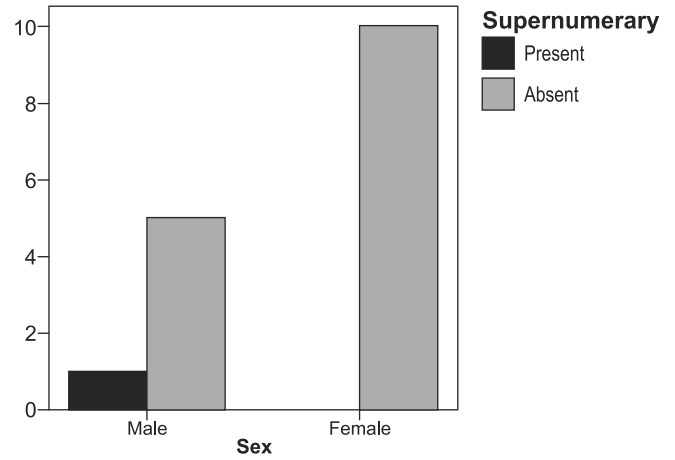


Fig 7: Supernumerary

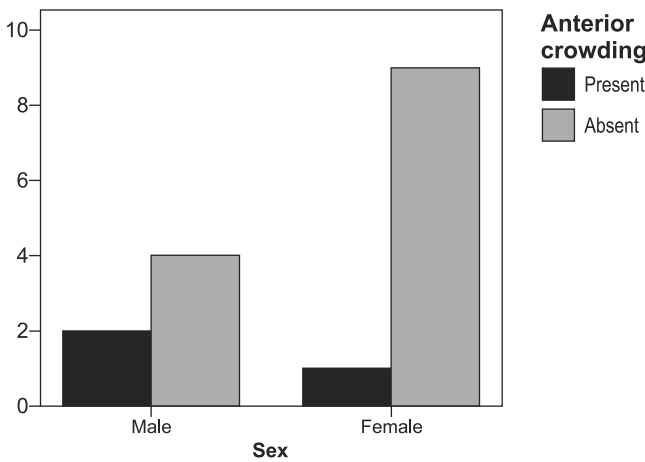


Fig 5: Anterior crowding

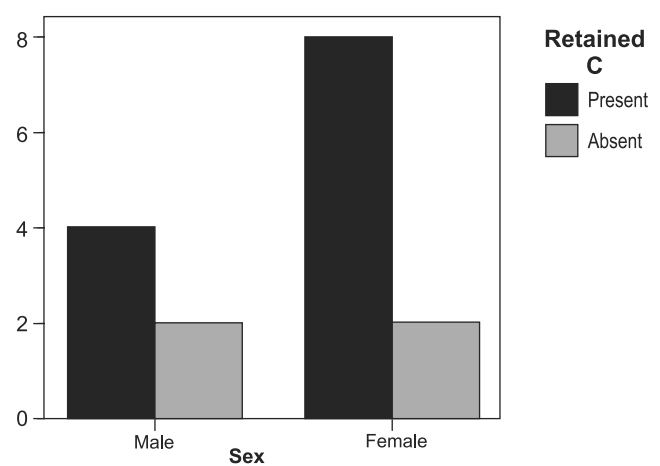


Fig 8: Retained deciduous canine

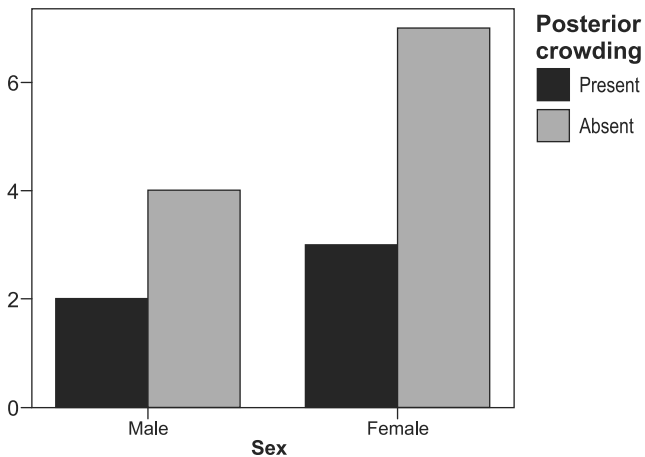


Fig 6: Posterior crowding

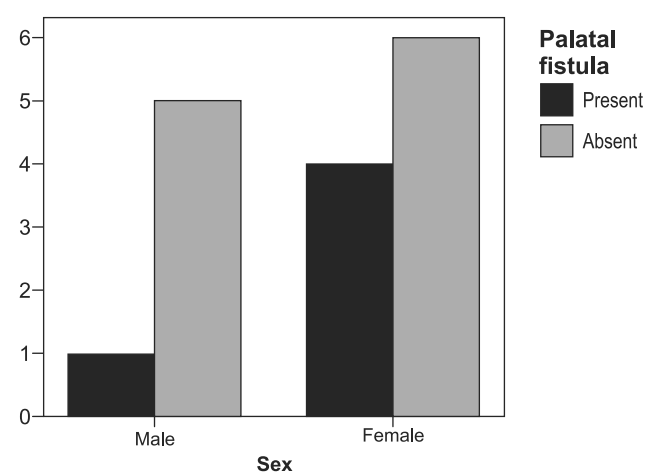


Fig 9: Palatal fistula

had a single supernumerary present (6.3%) (Figure 7). Frequency of posterior crowding was 31.3% (n=5) while that of anterior crowding was 75% (n=12) (Figures 3 & 4). 68.8% had posterior crossbite (n=11), 56.3% had anterior crossbite (n=9) (Figures 5 & 6). Number of retained deciduous teeth varied, in accordance with

the age of the patient at the time of presentation. Mainly maxillary deciduous canine is retained for long period of time where the underlying canine was impacted (75%, n=12) (Figure 8). Short lip was evident from the frontal view photographs in 75% of the patients (n=12).

DISCUSSION

Epidemiologic studies of defined geographic populations can serve as a means of establishing data important for the diagnosis, treatment, and counseling of patients with cleft lip and cleft palate. Several descriptive epidemiologic studies have been carried out in many countries worldwide. In a study Elahi et al, found cleft lip alone more frequently than isolated cleft palate and combined cleft lip and palate deformities. Male were more commonly affected by cleft lip, and cleft lip and cleft palate, whereas females predominated in the isolated cleft palate cases.⁹

Impacted canine is a frequently found anomaly in cleft patients. In this study 87.6% patients had impacted maxillary canine on either side, whereas, Russell and McLeod reported that patients with alveolar clefts had a 20-fold increased risk for canine impaction.¹⁰ Enemark and coworkers found 35% impaction of cleft-side canines in a group of population.¹¹

In this study 25.1% patients had missing maxillary lateral incisors (MLI). According to McCance the percentage of missing teeth was higher in the cleft group; the most commonly missing teeth in the cleft group were the MLIs.¹² In a study Al Jamal and colleagues have found missing teeth in 66.7% of the patients; the tooth most commonly missing was the MLI.¹³ 61% also had a lateral incisor anomaly which increased the risk for canine impaction (Russell and McLeod).¹⁰ Na-Young Kim and Seung-Hak Baek reported missing MLI in 41.7% of the total unilateral cleft patients in a Korean sample.¹⁴ Töndury¹⁵ reported that dental lamina differentiation into tooth germs occurred after the establishment of a cleft. Because deficiency of the mesenchyme can lead to insufficient mesenchymal support to the bud of the MLI, cleft patients with severe deficiency of mesenchymal mass would be likely to have congenitally missing MLIs.¹⁶

In the present study only one patient had a single supernumerary present (6.3%). On contrary to this Al Jamal and colleagues had found 16.7% supernumerary teeth.¹⁷ Nagai et al¹⁸ reported that the frequency of a supernumerary tooth was higher in an incomplete cleft than in a complete cleft. Baek and Yang¹⁹ reported that the incidences of supernumerary teeth were 13.5% in 37 unilateral cleft lip and alveolus patients and 9.5% in 116 unilateral cleft lip and palate patients. Na-Young Kim and Seung-Hak Baek¹⁴ study, the incidence in the

unilateral cleft lip and alveolus group (10.7%) was higher than in the unilateral cleft lip and palate group (2.3%). The unilateral cleft lip and alveolus patients had nearly 4.6 times more supernumerary teeth on the cleft sides than did the unilateral cleft lip and palate patients. Baek and Yang¹⁹ reported the descending order to be cleft lip, cleft palate, and cleft lip and palate. When cleft involvement was confined to the primary palate, supernumerary teeth were more prevalent in the unilateral CL&P patients.

Recently, it has been observed that supernumerary teeth are more common in the deciduous dentition. Moreover, the incidence of supernumerary teeth is greatest in cases of cleft lip only and decreases as the extent of the cleft increases.^{20,21,22}

Crossbites were another frequently found dental anomaly. There was insignificant difference between anterior and posterior crossbites, 56.3% and 68.8%, respectively. McCance and his team¹² found 19% increased incident of crossbites in cleft patients. M Mars²³ noticed a higher prevalence of crossbites in the cleft subjects (n = 8) than in the control group where there were none.

Aduss and Pruzansky²⁴ found that approximately 43% had overlap of the alveolar processes (mistakenly called collapsed arch). Among these patients, crossbites of the canine and first deciduous molar were the most common finding at 5 years of age. There were no anterior crossbites. Other investigators have reported similar results

Anterior Crossbite incidence was about 3%–5% in Scandinavia (Guyer et al.²⁵) This may be found in all facial types – prognathic, orthognathic, and retrognathic – in combination with varying degrees of hypo- or hyperplasia of the jaws.

On contrary to this M Mars²³ found no crowding in the buccal segments of either the control group or the cleft group. In fact, all dental arches examined were very well aligned and some spacing was generally evident.

Short lip was evident in 75% of the patients. This was particularly because of presentation of treated patients as a part of first step in cleft lip rehabilitation for lip function restoration to facilitate suckling in infant patients.²⁵ Thus this finding is representation of first step treatment that is nasoalveolar molding and

lip repair. Many a time this procedure is performed by general surgeon instead of plastic surgeon. This comes up as poor esthetic and function after lip construction. Moreover, lip contracture is complication of inadequate surgical procedure.²⁶

CONCLUSION

There is a strong relationship between dental anomalies and CL&P. This study presents complete description of dental anomalies present in the sample population but larger sample size is required to effectively determine the relationship of each dental anomaly with cleft type.

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