

FREQUENCY OF AGENESIS AND SHAPE ANOMALY OF MAXILLARY LATERAL INCISOR INPATIENTS WITH CANINE IMPACTION

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Abstract

Objectives: To determine the frequency of agenesis and shape anomaly of a maxillary lateral incisor in patients with canine impaction.

Materials & Methods: A sample of 50 cases having impacted maxillary canine were selected by convenient sampling technique. Participants are having an age of 13 -35 years and both genders included. The location of impacted canines was determined by using panoramic, periapical radiograph, and CBCT. The data were analyzed using SPSS version 20.0. Descriptive statistics were calculated. Chi-square test was used to compare the anomalies of upper lateral incisor among palatal and buccal canine impactions. $P < 0.05$ was considered significant.

Results: Males were 8(16%), and females were 42(84%). The mean age was 18.24 ± 3.9 with an age range of 14 to 25 years. Out of the 50 impacted canines, 35(70%) were in palatal position, 12(24%) were in buccal, and 3(6%) were in the maxillary alveolar region. Most of the impacted maxillary canine cases have no anomalies in lateral incisors ($n=36$, 72%). Impacted lateral incisors were 6(12%), Peg shaped were 5(10%) and missing were 3(3%). Missing and impacted lateral incisors were more in female gender while peg-shaped lateral incisors were more in males ($P < 0.05$). All Impacted and peg-shaped lateral incisor were associated with palatal while all missing lateral incisors associated with an impacted buccal canine was low ($p < 0.23$).

Conclusion: Anomalies of lateral incisor were in 28% of cases having impacted maxillary canine, while patterns of anomalies of lateral incisors were different among genders and various types of impacted maxillary canine (palatal and buccal) ($P < 0.05$).

Key Words: Dental anomalies, canine impaction, peg-shaped incisor

Introduction

Tooth agenesis affecting one or more deciduous or permanent teeth is the frequently experienced dental anomalies in young age¹. Tooth agenesis prevalence excluding the third molars ranges between 0.3-11.3%². Congenital absence of teeth is more in females than in males. Though local, systemic and genetic factors have been implicated in the aetiology of tooth agenesis, the degree to which genetic

and environmental factors are implicated remains unknown^{3,4}.

Maxillary lateral incisor is one of the more frequently missing tooth after the third molars³. Previous studies have shown that this tooth is the second most frequently missing tooth after the third molars⁵. Early recognition of tooth agenesis is helpful to provide adequate treatment and prevent a developing malocclusion⁶.

The maxillary canine is the second most common tooth affected by impaction after the third molar, with a prevalence of 1%–3%⁷. The aetiology of maxillary canine impaction is still not clear. The buccally displaced canine (BDC) and the palatally displaced canine (PDC) are characterized by different

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etiopathogeneses^{8,9}. Jacoby reported that 85% of the palatal impacted canines have sufficient space for eruption¹⁰. Others reported that the congenital absence or the presence of small lateral incisors is the cause for canine impaction. The mesiodistal crown width of the maxillary and mandibular incisors have been reported to be significantly smaller in palatal canine impact on patients^{11,12}. The root length of lateral incisors adjacent to palatally displaced canines was also reported as responsible for the displacement of the palatally impacted maxillary canines⁴.

Carvalho et al¹³ conducted a study on the relation between agenesis and shape anomaly of maxillary lateral incisors and canine impaction. Their results showed that among the patients with impacted canines, there were 21 anomalous teeth (small and peg-shaped) and among the control patients there were only three small and peg-shaped teeth, with a statistically significant difference ($p = 0.001$). No patients were found with impacted canines and absent lateral incisors. However, Brenchley and Oliver¹⁴, disagreed with the statement that there is an association between impacted canine and maxillary lateral incisor anomaly.

The purpose of this study was to determine the frequency of agenesis and shape anomaly of a maxillary lateral incisor in patients with canine impaction.

Materials and Methods

The present study was carried out at the Department of Orthodontics, Khyber College of Dentistry, Peshawar from June 2017 to March 2018. Approval from the hospital ethical committee was taken. Informed consent was taken from all participants after a detailed explanation. A sample of 50 cases having impacted maxillary canine was selected by convenient sampling technique.

The inclusion Criteria were; 1) Chronological age of 13 -35 years; 2) Panoramic radiographs with presence of impacted upper canine; 3) Patients that presented all teeth in the dental arch, except in cases of agenesis of maxillary lateral incisors; 4) Patients that did not present resin restoration nor enamel fractures of the maxillary and mandibular lateral incisors. Exclusion criteria were; 1) All panoramic radiographs with lack of distinctness and good quality; 2) Patients that presented maxillary or mandibular lateral incisors with enamel fracture or resin resto-

ration; 4) Documentation that showed radiographs, photographs and study cast in poor condition.

The presence of maxillary canine retention was evaluated, defining as retained canines those that the impacted canine should have a root apex completely formed, with no sign of eruption inside the oral cavity. The location of impacted canines was determined by using panoramic, periapical radiograph, and CBCT.

The data were analyzed using SPSS version 20.0. Mean, and the standard deviation was calculated for numerical variables like age. Frequency and percentage were calculated for a qualitative variable like gender, the location of impacted canine and anomalies of upper lateral incisor. Chi-square test was used to compare the anomalies of upper lateral incisor among palatal and buccal canine impactions. $P < 0.05$ was considered significant.

Results

In this study, a total of 50 cases with impacted maxillary canine were included. Males were 8(16%), and females were 42(84%). The mean age was 18.24 ± 3.9 with an age range of 14 to 25 years. The most common age group was 14 to 18 years ($n=27$, 54%) followed by 19 to 22 ($n=11$, 24%). The details are given in table 1.

Of a total of the impacted canines 35(70%) were in palatal, 12(24%) were in buccal, and 3(6%) were in the maxillary alveolar region. The most common pattern for impacted canine was unilateral ($n=38$, 76%). Only 12(24%) impacted canines were bilateral. In this study for 20(40%) cases CBCT was used to locate the impacted canine and rest of ($n=30$, 60%) cases were diagnosed using Orthopantomogram (OPG) and occlusal view in parallax technique.

Most the impacted maxillary canine cases have no anomalies in lateral incisors ($n=36$, 72%). Impacted lateral incisors were 6(12%), Peg shaped were 5(10%) and missing were 3(6%). (Fig 1). Missing and impacted lateral incisors were more in females, and peg-shaped lateral incisors were more in males. These differences were statistically significant ($P < 0.05$). The details are given in table 2.

All Impacted and peg-shaped lateral incisor were associated with palatal while all missing lateral incisors associated with an impacted buccal canine. In alveolar impacted canine cases no anomalies of

lateral incisors were found. These results were statistically significant ($p < 0.023$). (Table 3).

Fig: 1 Frequency of anomalies in lateral incisor in cases having impacted canine

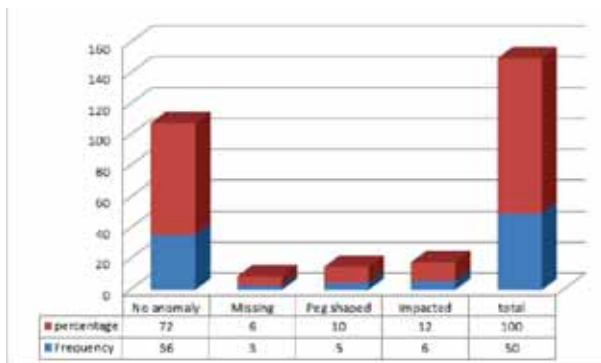


Table 1: Age distribution of the sample

Age group	Frequency	Percent
14-18	27	54.0
19-22	12	24.0
23-25	11	22.0
Total	50	100.0

Table 2: Comparison of anomalies in lateral incisor between males and females

An anomaly in lateral incisor	Gender			
	Male		Female	
	N	%	n	%
No anomaly	3	6.0	33	66.0
Missing	0	0.0	3	6.0
Peg shaped	5	10.0	0	0.0
small	0	0.0	0	0.0
impacted	0	0.0	6	12.0

Chi-square=29.539; df=3; P-value=0.000

Discussion

In this study females were more than males. This may be due to the high esthetics index among females and their more consciousness about their facial appearance. As we used the consecutive sampling technique in this study and included those participants, who are coming for orthodontic treatment. A similar study conducted by Mercuri et al⁸. on dental anomalies and clinical features in patients with maxillary canine impaction reported that female (n=82) were more than males (n=69). These results are in consistent with the current study.

Our findings showed that in 70% of cases the impacted canine was palatal, in 24% was buccal, and rest of (6%) was in the maxillary alveolus. Jena et al¹⁵. conducted a study on 66 patients reported that the occurrence of palatal canine impaction was almost 1.6 times more than the buccal canine impaction. These results are similar to our study. Similar results have also shown by Jacoby¹⁰.

In this study, most of the cases were diagnosed using parallax technique (OPG+occlusal view), and for 40% cases, CBCT were advised. Although parallax technique is inferior in adequately diagnosing impacted maxillary cuspids. However, according to Becker, the parallax technique is adequate to locate the palatal or buccal position, but for diagnosing root resorption, the CBCT is indicated. 16 In those cases which are difficult to diagnose we advised CBCT.

The current results showed that missing and impacted lateral incisors were more in females and peg-shaped lateral incisors were more in males. These differences were statistically significant ($P < 0.05$). Celikoglu et al³. conducted a study on the anomalies of maxillary lateral incisor and reported similar results. On the other hand, a study conducted

Table 3: Comparison of anomalies in lateral incisor among various position of impacted canine position

An anomaly in lateral incisor	Maxillary canine position					
	Palatal		Buccal		Alveolar	
	N	%	N	%	N	%
No anomaly	24	48.0	9	18.0	3	6.0
Missing	0	0.0	3	6.0	0	0.0
Peg shaped	5	10.0	0	0.0	0	0.0
small	0	0.0	0	0.0	0	0.0
impacted	6	12.0	0	0.0	0	0.0

Chi-square=14.613; df=6; P-value=0.023

on 68 participants by Ilknur et al¹⁷. on the Turkish population found a statistically significant difference for anomalies of a lateral incisor in maxillary impacted canine cases. These results are the difference from the current study. The difference may be due to genetic and ethnic variations.

According to the current findings, all impacted and peg-shaped lateral incisor were associated with palatally impacted canine while all missing lateral incisors associated with a buccally impacted canine. In alveolar impacted canine cases no anomalies of lateral incisors were found. In case of lateral incisor impaction, the maxillary canine may not have adequate guidance to erupt so may lead impaction as according to lateral guidance theory. 18 Similarly, Carvalho et al.¹³ reported that the size lateral incisor is a small size(peg shaped) in patients having palatal impacted canines. These results are in consistent with the current study. Ilknur et al.¹⁷ reported that all impacted lateral incisors were associated with palatal impacted canine cases and missing lateral incisors were associated with a buccally impacted canine. But their results were not statistically significant.

Conclusion

The findings of this study showed that; palatal maxillary canine impaction were more than buccal, unilateral maxillary canine impaction was more than bilateral, anomalies of lateral incisor were in 28% of cases having impacted maxillary canine, and patterns of anomalies of lateral incisors was different among genders and various types of impacted maxillary canine(palatal and buccal) statistically significantly ($P<0.05$).

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