ORIGINAL ARTICLE

MAXILLARY BUCCALLY DISPLACED CANINES: A NEW INSIGHT INTO AN OLD PROBLEM

[1]MUHAMMAD AZEEM
[2]SAIF UR REHMAN
[3]MUHAMMAD BURHAN HAYAT

ABSTRACT

The objective of this study was to analyze the prevalence of peg lateral incisors with of maxillary buccally displaced canines (BDC). The study was conducted at Department of Orthodontics, de,Montmorency College of Dentistry, Lahore in which records of fifty untreated BDC (23 males, 27 females) were included and size and shape of lateral incisors were measured and recorded. The significance of association between peg lateral incisors with of BDC was analyzed with the chi-square test. Twenty eight percent of subjects were found to be having peg laterals in subjects of BDC. It was concluded that there is a high prevalence of (28%) peg laterals with BDC. Thus, the appearance of small permanent lateral incisors could be a useful indicator of future occurrence of buccal ectopia of maxillary canines.

Key Words: *Buccally Displaced Canines; Peg Laterals.*

INTRODUCTION

Maxillary canine is most common tooth affected by impaction or displacement in anterior segment with a prevalence of 1-3%.[1-3] There is a difference between tooth impaction and displacement i.e. impaction is a infraosseous position of the tooth after the expected time of eruption, whereas displacement is a anomalous infraosseous position before the expected time of eruption.[4] The term "Peg lateral" refers to an morphological disturbance in which lateral incisors appear abnormally small in size compared to their usual more rectangular shape.[5] Anomalies in lateral incisor size may lead to disturbances in upper and lower arch length and occlusion and may also cause aesthetic and psychological issues. Therefore, peg-shaped tooth is a major concern among orthodontists.

Regarding aetiology of maxillary displaced canines, different theories have been proposed, two primary theories are: the guidance theory and the genetic theory.[6] The guidance theory[7] suggests that the eruption of the canine is influenced by presence, size, shape and positioning of the maxillary lateral incisor while genetic theory[8] suggests that the impaction is due to a genetic predisposition. The normal eruption path of the permanent canine is slightly buccal to the line of dental arch, and its eruption is preceded by that of the lateral incisor and the first premolar, which erupt directly in the line of the arch. Thus, any reduction of space i.e. crowding prevents the canine from moving into the arch and exaggerates its buccal position as eruption proceeds. Most BDCs are due to this. Nevertheless, a small but significant number of patients have a BDC, but there is no crowding to account for the displacement.

Peg laterals are one having incisal mesiodistal width of the tooth crown shorter than the cervical width. This can lead to aesthetic, orthodontic and periodontal problems for the patient.[9] Peg-shaped maxillary lateral incisor was reported by Clayton[10] as being present in 0.3% of US population, while Thilander and Myrberg[11] found same in 0.6% of Swedish school children. Salama and Abdel-Megid[12] found that peg shaped maxillary lateral incisors were present in 9% of the Saudi Arabia sample. Peg-shaped maxillary lateral incisor was found in 0.7% of the total sample size in the Icelandic sample.

Although the prevalence of different dental anomalies in different populations has been reported in several studies, but there were no studies involving peg-shaped permanent lateral incisors in relation with BDC in Pakistani population. No reported attempts have so far been made to study the correlation of buccal ecto-

[1] Muhammad Azeem, Assistant Professor Orthodontics, de,Montmorency College of Dentistry, Lahore, Pakistan
Tel: +92-3458409007 Email: dental.concepts@hotmail.com
For Correspondence: 25-E-2, Main Road, WAPDA Town, Lahore Email: dental.concepts@hotmail.com Cell: +92-345-8409007
[2] Saif ur Rehman, Postgraduate Trainee Orthodontics, de,Montmorency College of Dentistry
Tel: +92-3454741578 Email: burhanhayat@hotmail.com
[3] Muhammad Burhan Hayat, Postgraduate Trainee Orthodontics, de,Montmorency College of Dentistry
Tel: +92-3347008008 Email: dr.saifsandhu@gmail.com

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pia of maxillary canine with size of lateral incisors in Pakistani population; therefore objective of this study was to analyze the prevalence and relationship of peg lateral incisors with of BDC.

METHODOLOGY

This study was conducted after institutional approval at the Department of Orthodontics, de,Montmorency College of Dentistry, Lahore in which fifty Panoramic and Periapical radiographs along with plaster models from records of untreated BDC patients, between the chronological ages of 8 and 18 years (23 males, 27 females) were included. Duration of this study was January 2015 to March 2017. No ethical approval was sought because of the retrospective characteristics of the study design.

Peg-shaped maxillary lateral incisors presenting variations tooth size and number were evaluated as conical crown-size reduction or the mesiodistal width of an incisor tooth being shorter than the cervical width of the tooth crown according to criteria defined by Langlais et al.[19]

Inclusion Criteria

All teeth present except permanent 3rd molars

Patients of BDC with no dental crowding

Good quality pre-treatment records

Exclusion Criteria

Craniofacial syndromes

History of trauma

Any systemic or metabolic disease.

Data Collection Procedure

Panoramic radiographs were used to confirm the presence and size of maxillary lateral incisors. The size of maxillary lateral incisors was later on confirmed by measuring its mesiodistal dimension with standardized digital vernier callipers on plaster models. Dental history sheets were used to rule out any systemic disease and history of dental trauma.

Patients between the chronological ages of 8 and 18 years (23 males, 27 females) irrespective of side of involvement were included and analysed.

Statistical Analysis

The data were analyzed in Statistical Package for the Social Sciences software package (SPSS).[19] The significance of association between peg lateral incisors with of BDC was analyzed with the chi-square test. The patterns of peg-shaped maxillary lateral incisors were tested using the Pearson's Chi-square and Fisher exact tests.

RESULTS

Twenty eight percent of subjects were found to be having peg laterals in subjects of BDC. (Table 1 and 2)

DISCUSSION

The prevalence rate of peg shaped maxillary lateral incisors in the general population ranges from 1-3%.[1-3] Restorative or Prosthetic treatment may be considered to treatment of peg-shaped lateral incisors, otherwise aesthetic and psychological problems may occur.

A buccal or palatal canine deviation is associated with different characteristics of the dentition. A palatal displaced canine is usually found in non crowded dentitions. Its etiology has been explained as either a genetically determined abnormal location of the tooth bud or a deviation of the normal path of eruption caused by local environmental factors related to abnormal, late-developing lateral incisors.[6-8] In contrast, a BDC is strongly associated with a crowded dentition. Nevertheless, a small but significant number of patients have a canine that is buccally ectopic, but there is no crowding to account for the displacement. The study conducted here in de,Montmorency College of Dentistry, Lahore has revealed a remarkably high frequency of peg shaped lateral incisor associated with BDC i.e. 28%. The results are in agreement with Chaushu,[13] but in contrast to results of Jacoby,[14] Becker[15] and Chaushu,[16] who concluded that buccal displacement

TABLE 1: PREVALENCE OF PEG LATERALS IN PATIENTS WITH BDC

Lateral Incisor	Total (%)
Normal Laterals	72%
Peg Laterals	28%
Total (N=50)	100%

TABLE 2: CHI-SQUARE TEST FOR PEG LATERALS IN PATIENTS WITH BDC

	Value	Df	Asymp. Sig. (2 sided)	Exact Sig. (2 sided)	Exact Sig. (1 sided)
Pearson Chi-Square	.013	1	.904		
Continuity Correction	.002	1	1.003		
Likelihood Ratio	.011	1	.907		
Fisher's Exact Test				1.002	.599
N of Valid Cases	50				
Significant level < 0.05					

of the maxillary canines has been strongly associated with crowding. The prevalence of peg-shaped maxillary permanent lateral incisors varies by race, population type, and sex. Altug-Atac and Erdem[17] evaluated the prevalence of dental anomalies in 3043 orthodontic patients and reported that 48 patients had peg-shaped maxillary and mandibular lateral incisors. In a study by Kazanci et al.[18] investigated the prevalence of different developmental dental anomalies and reported that prevalence rates of peg-shaped maxillary lateral incisors were 2.12%.

The reason brought up in the literature about association of peg laterals with BDC is that the excessive space in the maxilla could be a contributory factor in the buccal displacement, for it enables sufficient space for the canine to move and deviate from its path of eruption. Also, the absence of guidance from the lateral incisor, allows a new course to a way further down and to the palatal side. Another reason is the possible biological relation between impacted canine and tooth size reduction.[20-21]

We have not excluded the genetic aspect in etiology of BDC, but we presented another etiological theory for the BDC in non crowded dentitions in terms of the lack of guidance from adjacent peg lateral incisor. We intend to use results from the present study to design a future multi-center prospective studies with increase sample size.

CONCLUSION

There is a high prevalence of peg lateral incisors with BDC (28%). Every patient that presents with peg maxillary lateral incisor must be investigated in detail, for they demonstrate tendency to present BDC.

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CONTRIBUTIONS BY AUTHORS

1 Muhammad Azeem:	Corresponding author, Results, conclusions, cross references & final editing.
2 Saif ur Rehman:	Title, abstract, discussion & final editing.
3 Muhammad Burhan Hayat:	Title, abstract, discussion & final editing