

Buccally Displaced Canine.**A comparison of Morphologies of Lateral Incisors and 1st Premolar**

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ABSTRACT

Objective: To explore differences in mesio-distal and bucco-lingual crown width of naturally fully erupted permanent maxillary lateral incisors and 1st premolars among patients with and without buccal canine displacement.

Study Design: Cross-sectional study

Place and Duration of Study: This study was conducted at the Orthodontic department at Islam Dental College, Sialkot for a period of 09 months from Jan to September 2020.

Materials and Methods: Pre-treatment casts were studied for the pervasiveness of maxillary anomalous lateral incisors, mesio-distal (MD) and bucco-lingual (BL) widths of Maxillary permanent teeth, i.e., Buccally displaced Canines, Maxillary Lateral Incisor and Maxillary 1st Pre-Molar were recorded using digital caliper on right and left side.

Results: Larger than normal Mesio-Distal and Bucco-Lingual dimensions were observed for the Lateral Incisors and the 1st Pre-Molar while smaller than average Mesio-Distal dimensions were observed for the Canines on the affected sides. Females were more affected

Conclusion: The results of our study concluded a highly significant result for Mesio-Distal and Bucco-Lingual dimensions of Lateral Incisors and 1st Premolar in patients with Buccally Displaced Canines on the affected side.

Key Words: Buccally displaced Canine (BDC), Maxillary Lateral Incisors (MLI) morphology, Maxillary 1st Premolar (M1stPM) morphology.

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INTRODUCTION

Ectopically erupting Canines can cause impactions, and some potentially harmful sequelae such as Arch Length Discrepancy, Root resorptions – internal as well as External of the Impacted Canines and adjacent teeth, Dentigerous cyst formation and referred pain, requiring intervention¹. As a consequence, deviation from the normal path of tooth eruption of maxillary canine i.e ectopia results². The canine either erupt or stay impacted in buccal or palatal location in the dental arch. Palatal canine impaction exceeds Buccal canine impaction by a ratio of 2:1 or 3:1.

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Lateral Incisor and the 2nd Pre-Molar erupt directly in the line of the arch followed by the eruption of permanent canine which erupts slightly Buccal to the line of dental arch. Consequently, reduction in space present between the roots of adjacent teeth hinders the movement of canines into the arch resulting in their displaced buccal location³. Average tooth dimensions (including all tooth groups) in patients with palatally-displaced canines was significantly less than that in the control group. Significantly smaller tooth size was observed in patients with palatally displaced Canines⁴. PDC (palatally displaced Canines) occurs frequently in subject with Class I Malocclusion. In 16% of the PDC subjects, either lateral Incisor is congenitally absent or Peg-shaped, demonstrating a clear association between palatally impacted Maxillary Canine and anomalous or congenitally missing tooth⁵. In PDC sample, up to 10-fold increased prevalence of the peg-shaped maxillary lateral incisor is observed⁶.

Despite adequate space within the dental arch, buccal ectopic eruption of the canines usually occurs. This condition has been defined as primary tooth germ displacement – the tooth develops in a deviant site or with an unusual direction due to an abnormal genetic pattern. No other dental features have been found with

these canines⁷. No dental age discrepancy is observed in 2/3rd of the patients having buccally ectopic canines⁸. A number of studies have been carried out to investigate palatally impacted canines. Lateral Incisors and 1st pre-molars have also been investigated a lot for their role in cases of palatally impacted and displaced canines on the basis of their crown dimensions and root morphology.

However, lateral incisors and 1st premolars have not been investigated for their role in buccally displaced canines. Whether or not their crown morphologies have any effect on the buccal displacement of canines still remains a question at large.

Accordingly, current study was done to measure size of maxillary teeth in buccally displaced canines and to evaluate, whether dentitions with BDC have common features which may be explicit for the condition when compared with normally erupting canines. In particular, the study was carried out, if there exist a significant relationship between...

1. Lateral incisor dimension and buccal displacement of adjacent canines.
2. 1st Premolar dimension and buccal displacement of adjacent canines.
3. Buccal displacement of Canine with Gender.

MATERIALS AND METHODS

Out of 30 subjects, the pre-treatment records of 12 males and 18 females with BDC were selected from a 600 consecutively treated cases in the orthodontic department at Islam dental college, Sialkot. Pre-treatment dental casts of patients aged at least 11 years were included in the sample. Patients included in the sample had one buccally displaced canine. None of the patients has undergone any restorative or orthodontic treatment in the past. Partially impacted, carious and teeth with restorations were excluded and no measurements were noted where the true tooth contour was concealed by calculus or plaque.

According to the established standardized techniques, the BDC was diagnosed on the basis of clinical examination and dental casts. If even part of the canine was visible in the oral cavity, it was considered as erupted.

Following measurements were recorded for both the affected and unaffected sides;

1. The MD dimension of Maxillary Canine, Lateral incisor and 1st Premolar.

Measurements of maximum MD dimension of BDC, erupted maxillary lateral incisors and maxillary 1st premolar were recorded. With the help of a digital caliper and straight tips, the measurements were carried out on the plaster casts to precision of 0.01mm.

2. Independent T-test was used to compare the MD dimensions of the teeth of the affected side with the unaffected side.

3. Skeletal classification.

The skeletal classification was made on the basis of cephalometric analysis.

RESULTS

In our study, the mean mesio-distal dimensions of the lateral incisors on the affected side (7.20 ± 0.56 mm) were larger than the mesio-distal dimensions of the lateral incisors on the non-affected side (6.97 ± 0.63 mm). The mean mesio-distal width of the canines on the affected side (8.29 ± 0.44 mm) were smaller than the mesio-distal width of the canines on the non-affected side (8.32 ± 0.46 mm). However, this difference was not significant (see table 2). The mean mesio-distal dimension of the 1st premolars on the affected side (7.44 ± 0.44 mm) was larger than the mean mesio-distal dimension of the 1st premolars on the non-affected side (7.30 ± 0.39 mm). It was also observed that it was the females who were more affected than males.

Table No.1: Descriptive statistics for skeletal classes

	Frequency	Percent
Class I	6	20
Class II	18	60
Class III	6	20
Total	30	100

Table No.2

Groups	P Value
Lateral incisors	< 0.001 *
Canines	0.433
Premolars	< 0.001*

* P value < 0.01 Is highly significant

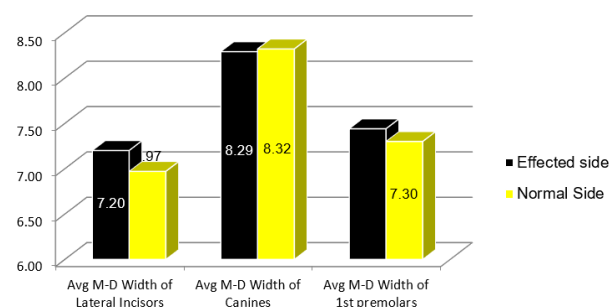


Figure No.1: Comparison of Average Mesio - Distal Widths of teeth on Affected and Normal side

DISCUSSION

The results of our study concluded that larger than normal mesiodistal and buccolingual dimension were observed for the lateral incisor, the 1st premolar and canine on the affected side.

Our findings were consistent with the results of Stella Cchaushu, et al, who reported in a study that patients with bilaterally displaced canines, the mesiodistal width was greater than the mesiodistal dimension with unilateral BDC, statistical significance for lateral incisors only ($P < 0.01$)⁷.

In another study by Sharabi S and Becker A, the results showed noticeable sexual dimorphism. Wider than average teeth were existing in BDC females, however teeth in BDC males were normally sized. As compared to the bilaterally affected females, smaller sized teeth were measured for females affected unilaterally⁷. These findings are in agreement with our results which also demonstrated that it was majority of the females who had BDC's.

However, our study showed remarkably contrasting results to a study by Stella Cchaushu, who's results demonstrated that the valuation of bilateral with the unilateral BDC had smaller teeth than normal in the bilateral subjects of both genders, although this difference was small and statistically insignificant⁸.

Our results are in striking disagreement with the results of Paschos E et.al, which reported that when the tooth dimensions of central incisors, lateral incisors and canines were noted in patients with unilateral canine displacement, a significant difference was noted for the effected sides compared to those of the non-affected sides in the same patient.⁹

Sune Ericson & Krister Bjerklín documented that the dental follicle of canine varied in its width and shape according to its location in the jaw. Follicles of the canines which were displaced buccally and apically were significantly wider than the follicles of normally positioned canines. They also observed that the mesiodistal dimension of the dental follicle of an ectopically erupting cuspid was measured to be 2.7-3.2 mm in width compared to 2.3-2.7 mm width of a normally erupting canine. The dental follicle of an ectopically erupting maxillary canine was on average wider than the dental follicle of normally erupting canine.¹⁰ Our findings were inconclusive in this regard as in some cases we observed larger than normal mesiodistal dimension of the canines that were buccally displaced which could have larger than normal mesiodistal dimension in the follicular stage, however a smaller than average crown size was documented for the displaced canines as a group.

The results of our study concluded a highly significant difference for the mesiodistal dimension for lateral incisor and 1st premolar with buccally displaced canine on the affected side.

CONCLUSION

The results of our study concluded a highly significant result for Mesio-Distal and Bucco-Lingual dimensions of Lateral Incisors and 1st Premolar in patients with Buccally Displaced Canines on the affected side.

Author's Contribution:

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Conflict of Interest: The study has no conflict of interest to declare by any author.

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