



Original Article

Evaluation of Buccal Corridors in Patients Seeking Orthodontic Treatment in Different Types of Malocclusion at Tertiary Care Hospital

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ABSTRACT

There are many factors that make an appealing smile, and the buccal corridor is one of the most crucial smiling characteristics. **Objective:** To evaluate the width of buccal corridors in patients with different types of malocclusions seeking orthodontic treatment at tertiary care hospital LUMHS Jamshoro/Hyderabad. **Methods:** 93 subjects were studied. Patients were asked to smile fully to measure buccal corridor width with a vernier caliper. The buccal corridor was estimated by multiplying the maxillary interproximal width by the inner lip corner distance by 100. They were divided into 5 modes by buccal corridor percentage. i-e: Buccal corridor 2% (wide smile), Buccal corridor 10% (nearly a wide smile), Buccal corridor 15% (mediocre smile), Buccal corridor 22% (nearly a narrow smile), Buccal corridor above 22% (narrow smile). Angle's malocclusion classification classified all patients. **Results:** The mean age was 19.18. Males were 34.4% and females were 65.6%. With various types of buccal corridors among them, 37 participants were in a class I malocclusion, 43 were in the class II and 13 were in the class III malocclusion. 14 participants belongs to medium narrow buccal corridors (15.1%), 18 belongs to the medium buccal corridors (19.4%), 47 belongs to the medium broad buccal corridors (50.5%), and 14 belongs to broad buccal corridors (15.1%). The results showed that there was no significant association between these two variables having p-value 0.207. **Conclusion:** Medium broad buccal corridors were seen more frequently in various types of malocclusion.

INTRODUCTION

The most fundamental means of human interaction is the smiling. It enhances face beauty and contributes to the definition of a person's personality's skills and traits. The relevance of the smile on the facial look has been emphasized in contemporary orthodontics. By boosting self-confidence, it influences how socially acceptable we are and leads to more comfortable communication. Children pay greater attention to the anterior teeth's look than to occlusion [1]. The key to starting a successful orthodontic office is to think about your perfect smile and

incorporate that information into your practice [2]. A number of elements contribute to an appealing smile, including the phonemic curvature of the upper dental arch with the lower lip, the width of buccal corridors, the portion of dental and gingival display, the colour of the teeth and gingiva, the nonattendance of cant in the occlusal plane, and the number of teeth that are visible when smiling [3]. One of the inescapable elements that has recently attracted clinicians' concern is the buccal corridor [4]. The bright space that appears between the labial surface of the

maxillary posterior teeth and the inner mucosa of the soft tissues that form the corners of the mouth and the cheeks when someone smiles is produced by this aspect of smile appearance, also known as lateral dark space, lateral negative space, or "shadow tunnel." [5]. The buccal corridor width is the most problematic aspect of smile beauty among the aforementioned elements since there is no disagreement in the studies on the appropriate size. This might be attributed to a variety of etiologic variables that impact the buccal corridor's size, such as a maxillary shortage in either the transverse or sagittal dimensions, and extractions in the upper arch as a consequence of prior tooth loss or the orthodontic treatment strategy [6]. Various malocclusions may have buccal corridor widths that seem to be different sizes. The buccal corridor becomes smaller as the visible maxillary teeth gets wider, creating narrow buccal corridors. The goal of the current research is to evaluate, from a dentist's perspective, the beauty of smiles in relation to various buccal corridor widths in various malocclusions [7]. When there is a significant buccal corridor and transverse maxillary deficit, orthopaedic or surgical maxilla enlargement may be an option. However, in a maxilla that is essentially normal, the diminution of the buccal corridor should not be thought of as the justification for maxillary growth [8]. Buccal pathways reveal both the sagittal and transverse relationships of the maxilla in addition to their transverse relationships. The buccal corridor becomes bigger if the maxilla is positioned posteriorly, and conversely [9]. While there is some knowledge on the appropriate size of buccal corridor in the previous literature, much of it is based on clinical judgments, and the scientific research that have looked into this topic have produced conflicting results [10]. Numerous studies have shown that wider grins and buccal corridors are found as additional appealing. However, some scientists pointed out that buccal corridor width has little impact on how the smile is seen aesthetically. Thus, this study aim to assess the evaluation of buccal corridors width in patients with different malocclusions and their smile esthetics.

METHODS

From September 2020 to April 2021, this comparative cross-sectional research using non-probability consecutive sampling was carried out at the orthodontic department of LUMHS Jamshoro/Hyderabad. Total sample size was 93 (constituted of 3 groups of malocclusion), which was calculated by open Epi calculator. Participants with both genders and having age range of 12 to 30 years were included in the study. While participants with previous history of orthodontic treatment or having any facial deformity such as cleft lip & palate or history of trauma and supernumerary or congenitally missing teeth

were excluded from study. All subjects were with normal morphology of dentition with the possible exception of 3rd molars. Those participants who meet the inclusion criteria were asked to sign a written consent and were asked to give a full smile to record the buccal corridor width with the help of vernier caliper. Full face frontal smiling view photographs were taken with Samsung digital camera at standard setting of 10 mega pixels at auto mode, at a distance of 2 feet. The cropping and editing of all the photographs were made by using Adobe Photoshop Version 7.0. The buccal corridor will be determined by multiplying the ratio of the width of the maxillary interproximal to the distance between the inner lip corners by 100. They were divided into five categories based on the amount of buccal corridor, including buccal corridors of 2% (wide smiles), 10% (almost broad smiles), 15% (mediocre smiles), 22% (nearly narrow smiles), and over 22% (modes with more buccal corridor) (narrow smile). According to Angle's classification of malocclusion, all the cases were categorized. Data were transferred to EPI data 3.1, EPI association for analysis after being saved in Microsoft office excel 2007 (Microsoft company WA, USA). Frequency and percentage has been completed for qualitative variable like gender, educational status, ethnicity and socioeconomic status. Affect modify like age, gender, educational status, ethnicity and socioeconomic status was controlled through stratification. Post stratification chi-square test, analysis of variants was applied to the data at p-value-0.05.

RESULTS

In this study 93 patients were enrolled. Of 93 patients 32(34.4%) were male and 61(65.6%) were female, as shown in figure 1.

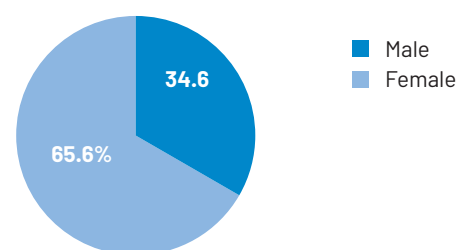


Figure 1: Gender distribution of the participant

Table 1 shows descriptive statistics of age of participants, in which mean age was 19.1828, minimum 14.00, maximum 28.00 and standard deviation was 3.54458.

N (Total No: of Patients)	93
Mean	19.1828
Minimum	14.00
Maximum	28.00
Standard deviation	3.54458

Figure 1: Gender distribution of the participant

Table 2 shows different types of malocclusions according to angle's classification, 37 participants belongs to class I (39.8%), 43 participants belongs to class II (46.2%), whereas 13 participants belongs to class III (14.0%).

Category	n (%)	Cumulative Percent
Class-I	37(39.8%)	39.88
Class-II	43(46.2%)	6.0
Class-III	13(14%)	100.0
Total	93(100%)	

Table 2: Different malocclusions according to the angle's classification

Table 3 shows various types of buccal corridors in which narrow buccal corridor was 0%, medium narrow buccal corridor was 15.1%, medium narrow buccal corridor was 19.4%, medium broad buccal corridor was 50.5%, and broad buccal corridor was 15.1%.

Types of buccal corridor	n (%)
Narrow buccal corridor	0(0%)
Medium narrow buccal corridor	14(15.1%)
Medium buccal corridor	18(19.4%)
Medium broad buccal corridor	47(50.5%)
Broad buccal corridor	14(15.1%)
Total	93(100%)

Table 3: Various types of buccal corridors in the participants

According to the distribution of angle's classification with various types of buccal corridors there wasn't any finding of narrow buccal corridor in any class of malocclusion but in medium narrow buccal corridor there were 10 participants of class I, 3 in class II and 1 in class III, in medium buccal corridor there were 6 participants in class I, 9 in class II and 3 in class III, in medium broad buccal corridor there were 18 participants in class I, 23 in class II and 6 in class III, in broad buccal corridor there were 3 participants in class I, 8 in class II and 3 in class III. All these findings are shown in table 4.

Type of buccal corridor	Angle's Classification			Total
	Class-I	Class-II	Class-III	
Narrow buccal corridor	0	0	0	0
Medium narrow buccal Corridor	10	3	1	14
Medium buccal corridor	6	9	3	18
Medium broad buccal corridor	18	23	6	47
Broad buccal corridor	3	8	3	14
Total	37	43	13	93

Table 4: Distribution of malocclusion with different types of buccal corridor

DISCUSSION

As smile aesthetics has grown in popularity in the literature on orthodontics. As more and more adults seek orthodontic treatment, it is crucial for orthodontists to take adult patients' smile aesthetics into account [11]. As people age advances, their perioral soft tissues shift,

which has an impact on their smile. In a number of articles, researchers evaluated photographs of smiles with varying buccal corridor widths [12-14]. Researches carried out by Gul e Erum and Ritter DE, altered the same smile by teeth removing or adding, changing the breadth of the teeth beginning with the first maxillary premolars, or altering the quantity and transverse width of the posterior teeth [1, 15, 16]. On the other hand studies performed by Yang IH, Afsari E and Aksu M contrasted the smiles of several people whose lateral dark spaces had nothing in common, either by removing premolars or in another way [17-19]. Jabbar A et al in his study concluded that there is no significant difference when judging the effects of buccal corridors on the smile attractiveness between the male and female raters, for both the consultants and residents [20]. Both preferred narrow buccal corridor to medium and broader buccal corridors. In this study we found that the narrow buccal corridor was 0%, medium narrow buccal corridor were found in 15.1%, medium narrow buccal corridor were found 19.4%, medium broad buccal corridor were found 50.5%, and broad buccal corridor were found 15.1%. In contrast to our study, Jabbar A found medium broad buccal corridors as most frequent entity [20]. In this study there were different types of malocclusions according to angle's classification, among them 37 participants belongs to class I (39.8%), 43 participants belongs to class II (46.2%), whereas 13 participants belongs to class III (14.0%). According to the distribution of angle's classification with various types of buccal corridors there wasn't any finding of narrow buccal corridor were present in any class of malocclusion but in medium narrow buccal corridor there were 10 participants of class I, 3 in class II and 1 in class III, in medium buccal corridor there were 6 participants in class I, 9 in class II and 3 in class III, in medium broad buccal corridor there were 18 participants in class I, 23 in class II and 6 in class III, in broad buccal corridor there were 3 participants in class I, 8 in class II and 3 in class III. Similar to our findings, the research done by Bhat R and Ackerman et al, Class II individuals had significantly more buccal corridor space than the Class I group [21, 22]. This might be because Class II Division 1 people have a narrower maxillary arch than Class I subjects. This research used mouth view to assess how buccal corridors affected the aesthetics of smiles. Clinicians should be aware that even a little modification to buccal corridor spaces may have a big impact on how people perceive the aesthetics of a smile.

CONCLUSIONS

The buccal corridor exercised a remarkable influence on smile esthetics, Smile characteristics differ between different types of malocclusion. It was concluded that medium broad buccal corridors were seen more frequently

in various types of malocclusion. With various types of buccal corridors among them, class II malocclusion was most frequently encountered.

Conflicts of Interest

The authors declare no conflict of interest

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