

## Average Buccal Corridor Space in Indian Population with Class I Occlusion.



### Orthodontics

**KEYWORDS :** Negative space, buccal corridor, aesthetic smile.

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### ABSTRACT

*Aim of the study - The purpose of this study was to evaluate the average buccal corridor width for a sample of Indian adults with Class I normal occlusion.*

*Materials and Methods -The sample consisted of 60 Indian adults aged between 18-25 years with Class I incisor, canine and molar relationship. Clinical examination and digital frontal photograph with posed smile were performed for each individual and measurement of buccal corridor was done. Descriptive statistics and independent sample t-test were performed for the sample.*

*Results and Conclusion - Average buccal corridor space in Indian population with Class I occlusion was found to be 9.58% (medium broad smile). In males, it was found to be narrower (8.49%) than in females (10.67%).*

### INTRODUCTION-

Buccal corridors also known as negative or black spaces were defined by Frush and Fisher<sup>1</sup> as the spaces between the facial surfaces of posterior teeth and the corners of lips when a person is smiling.

The perceived dimensions and depth of the shadows in this space depend on several factors, such as the width of the dental arches, the sagittal position of the dental arches, the range of horizontal movements produced at the lip commissure and the type of lighting utilized during the assessment and photographic session. Both the absence and the enlargement of the buccal corridors negatively affect the aesthetics of the face. The smile with lack of buccal corridors is called a "denture smile."

Krishnan et al.<sup>2</sup> noticed that there is a difference of opinion among investigators about the esthetic value of buccal corridors. Roden Johnson et al.<sup>3</sup> explained that some investigators did not recognize any esthetic value for buccal corridor; while others believed that visible buccal corridors are unattractive.

The Buccal corridor width also differs between male and female. Men showed a statistically larger buccal corridor than the women, yet the percentage difference was not significant.<sup>4</sup>

The purpose of this study was to evaluate the average buccal corridor width for sample of Indian adults with Class I normal occlusion.

### MATERIALS AND METHODS-

40 dental students (18 male, 22 female), age ranges between 19-23 years with Class I occlusion were selected. Posed smile photos were taken with the digital camera (14.1 megapixel, SONY cybershot).

For standardization of the image, cephalostat was used for head stabilization and Frankfort horizontal plane was kept parallel with the floor. Photos were taken from 4 ft. distance and transferred to laptop. With the help of Onde rulers software; measurements of distance between buccal surface of posterior teeth and distance between inner commissure were taken.

### Criteria for selection of samples-

- Full permanent dentition excluding third molars.
- Bilateral Class I molar and canine relationship.

- Class I incisor relationship.
- No or mild crowding and spacing (<1mm).
- No crown and bridge prosthesis.
- No anterior or posterior crossbite.
- Absence of gross asymmetry of the face and the jaws with acceptable facial esthetics.
- No previous orthodontic, orthopedic or facial surgical treatments.
- Overjet and overbite of 2-4 mm.
- No history of bad oral habits like thumb sucking, tongue thrust or mouth breathing.



Inner Commissure Width = 14.85



Buccal Surface Of Posterior Teeth Width = 13.48

The following method was used to measure Buccal corridor space<sup>5</sup>:

Buccal corridor space in % =

$$100 - \frac{\text{Distance between buccal surface of posterior teeth} \times 100}{\text{Distance between inner commissure}}$$

$$\text{e.g. } 100 - \frac{13.48 \times 100}{14.85} = 100 - 90.77\% = 9.23\%$$

STATISTICAL ANALYSIS AND RESULTS -

[Table-1 Distribution of gender]

Sex	Frequency	Percent
Male	18	45.0
Female	22	55.0
Total	40	100.0

18 males and 22 females were included in this study, with total number of 40. Distributions of gender were 45% male and 55% female (Table-1).

Descriptive Statistics

Statistics		Male	Female
Mean		8.49074	10.673
95% Confidence Interval for Mean	Lower Bound	6.66255	9.13143
	Upper Bound	10.319	12.215
Variance		13.515	12.090
Std. Deviation		3.6763	3.4771
Minimum		2.831	5.782
Maximum		14.595	17.720

[Table-2]

Descriptive analysis showed mean value of buccal corridor in male to be 8.49074% and in female it was 10.673% with standard deviation of 3.6763% and 3.4771% respectively. Minimum buccal corridor in male was 2.831% and maximum was 14.595%. For females, minimum buccal corridor was 5.782% and maximum was 17.720%.(Table-2).

Independent t-test					
Group Statistics					
	Sex	N	Mean	Std. Deviation	Std. Error Mean
BC (%)	Male	18	8.49074	3.676314	0.866510
	Female	22	10.6731	3.477128	0.741328

Test for Equality of Means						
t-value	df	p-value	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
					Lower	Upper
-1.925	38	0.062	-2.182	1.134	-4.477	0.113

According to t-test, difference between male and female buccal corridor space was not statistically significant.

DISCUSSION-

An attractive, well-balanced smile is a paramount treatment objective of modern orthodontic therapy. Along with cephalometrics and study models, smile analysis plays an equal and integral part of contemporary orthodontic diagnosis and treatment planning.

In the study done by Moore et al<sup>6</sup>, buccal corridor was represented as a percentage of total smile width. By trial and error, the authors had developed and defined a range of buccal corridors and described them by the corresponding smile fullness. They defined buccal corridors of 28% as medium-narrow, 15% as medium, 10% as medium broad, and 2% as broad smile fullness.

The purpose of our study was to evaluate the average buccal corridor space width in Indian adults with Class I normal occlusion. Buccal corridor has its esthetic importance. Our study evaluated mean buccal corridor space in Indian population with Class I orthognathic population. We used cephalostat to stabilize the head and we standardized the image for minimal errors. Measuring the buccal corridor in millimeters could lead to error, so, we used the percentage value.

According to Moore et al<sup>6</sup> there was no difference between male and female buccal corridor space. They also concluded that having minimal buccal corridors is a preferred esthetic feature for both male and female, and large buccal corridors should be included in the problem list during orthodontic diagnosis and treatment planning.

Ritter et al<sup>7</sup> did a study and concluded that the males showed a statistically larger buccal corridor than females, yet the percentage difference was not significant.

We found an average of 9.58% buccal corridor for the entire sample. In which male average was 8.49% and female average was 10.67%. According to our study males possess narrower buccal corridor than females. According to Vishnu et al<sup>8</sup> females showed greater tendency for narrow arch form while males showed greater tendency for wider archform. This can be a reason for narrower buccal corridor space in males. Although the difference between both was statistically not significant.

CONCLUSION-

- Average Buccal corridor space in Indian population with Class I occlusion is 9.58% (medium broad smile).
- In males it is narrower (8.49%) than in females (10.67%).
- Difference between both is statistically not significant.

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