

EFFECT OF BUCCAL CORRIDORS WIDTH ON SMILE ESTHETICS

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Abstract:

Introduction: Soft tissue aesthetics are gaining an ever increasing importance in Contemporary orthodontic practice. The Esthetics of smile plays a major role in successful outcome of an orthodontic treatment. It is influenced by a number of factors, of which the extent of visible buccal corridor has a key role. The aim of this study was to compare buccal corridor widths in randomly selected subjects and evaluate the attractiveness of their smile.

Materials and Methods: Non probability purposive sampling technique was used. 60 subjects (30 male, 30 female) were selected with age ranging from 18 to 25. For each patient, a standardized picture was photographically analyzed and then presented to a panel of judges.

Results: The study showed that subjects with minimal buccal corridor width as determined by photographic analysis were rated more esthetically pleasing by both General Dentists & Orthodontists.

Conclusion: General Dental Practitioners and the Orthodontists both prefer smiles with minimum visible buccal corridors however the GDP were less discriminative on smile aesthetics related to BCWs than Orthodontists.

Key words: Soft Tissue, Smile, Buccal Corridors, Photographic Analysis.

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INTRODUCTION:

As is said, all the statistics in the world can't measure the warmth of a smile. Smile is one of the most distinguishing features defining the personality. Among humans, it is customarily an expression denoting pleasure, happiness, and amusement. A beautiful smile improves confidence, self esteem, makes the appearance younger, and improves social interactions.

Smile is a facial expression formed by flexing the muscles near both ends of the mouth. Because faces have only a limited range of movement, expressions rely upon fairly minuscule differences in the proportion and relative position of facial features, thus further stressing the importance of the esthetics of smile¹.

Esthetics of smile is influenced by many features such as the amount of gingival display, length of the incisors, shape of teeth, presence of a smile arc, shade of the teeth & buccal corridors.

Presence or absence of buccal corridors (BC) is potentially an important smile feature². Buccal Corridors can be best assessed on the Frontal Smile Photograph which is now an essential component for Orthodontic Diagnosis & Treatment Planning. Presence or absence of Buccal Corridors has been best evaluated by analyzing Buccal Corridor width. Buccal Corridor Width is defined as the space between the buccal surfaces of the maxillary teeth and the corners of the mouth during a smile. Frush and Fisher however

defined the buccal corridors as the space between the facial surface of posterior teeth and the corners of lips, when the patient is smiling³.

It is a general consensus that smaller Buccal Corridors make a smile more attractive while large Buccal Corridors are displeasing & unaesthetic⁴. Studies by Moore *et al* have shown that broader smiles with no Buccal Corridors are more attractive than smiles with Buccal Corridors⁵. However few previous studies have indicated that Buccal Corridors have no impact on smile attractiveness⁶. Dunn et al concluded otherwise that a greater number of teeth displayed during smiling is significantly more attractive than having fewer teeth displayed, thus reducing visible buccal corridor⁷.

Aim of this study is thus to assess the influence of Buccal Corridors on the smile esthetics in view of Orthodontists & General Dentists and to compare difference in their assessment if any.

MATERIALS AND METHODS

This cross sectional descriptive study was conducted in the orthodontic department of the de'Montmorency College of Dentistry / Punjab Dental Hospital Lahore. The sample consisted of 60 subjects of age range 18-25 years. Out of this sample size, 30 subjects were males and 30 were females. The sampling comprised random purposive selection of subjects.

INCLUSION CRITERIA:

This study will include subjects having:

- ❖ Full compliment of teeth.
- ❖ Normal morphology of teeth.
- ❖ No visible facial asymmetry.

EXLUSION CRITERIA:

Subjects with

- ❖ Extraction of any tooth visible during smile
- ❖ Scarring of lips or cheeks
- ❖ Syndromes e.g. cleft lip and palate

DATA COLLECTION PROCEDURE

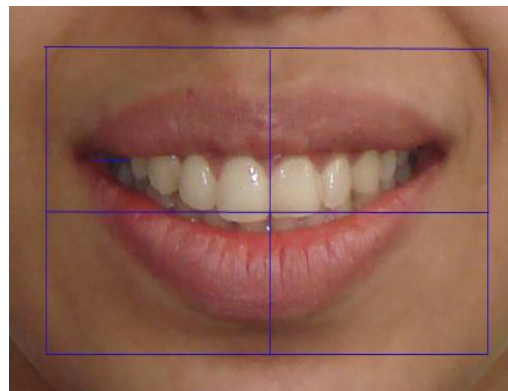
60 subjects of both sexes were collected from orthodontic dept of de'Montmorency college of dentistry. The subjects were selected according to the selection criteria.

Full face frontal smiling view photographs of selected subjects were taken with a Nikon P5100 digital camera. All photographs were taken at standard settings of 5 mega pixels, at auto mode, with flash, at a distance of 4 feet, in a well lit room, with even distribution of light. A pure white back ground was used for all the pictures.

All photographs were cropped and edited in Adobe Photoshop Version 7.0, and smile fullness was calculated as the visible maxillary dentition width divided by the inner commissural width. The extent of buccal corridor was calculated as the difference between visible maxillary dentition width and inner commissural width.

All photographs were presented to a panel of 30 judges, comprising of 15 specialist orthodontists and 15 general dental practitioners, for independent evaluation of photographs rating them from poor to Excellent.

Each photograph was assigned an average of the ratings by orthodontists, and a separate average rating by GDPs. The results were compiled and tabulated and compared with the buccal corridor width of each subject using Statistical Package for Social Sciences (SPSS Inc., Chicago, Illinois, USA)



RESULTS:

Overall calculated Buccal Corridor Width is 3.69 ± 1.08 . For males it is slightly higher than for females as shown in Table I

Among the orthodontists, the results showed that there was a higher rating for subjects with minimum visible buccal corridors irrespective of gender as shown in Table II. There was a slightly higher rating for males with lesser buccal corridors than in females as shown in Table III. There was no significant difference in rating between the orthodontists individual assessment.

Among the general practitioners, the results were similar. There was a higher attractiveness rating for subjects with lesser buccal corridors than those with wider buccal corridors as shown in Table II. Again, the results were corresponding to the evaluation by orthodontists with respect to gender. However, the general practitioners rated the females with slightly more wide buccal corridors as more attractive than the rating by orthodontists as shown in Table III.

Table I
Descriptive Statistics Total Data (N=60)

	Min	Max	Mean	SD
Age	18 yrs	25 yrs	21.50	2.04
BCW	1.10	5.60	3.69	1.08

Descriptive Statistics Male (N=30)

	Min	Max	Mean	SD
Age	18.00	25.00	20.80	2.12
BCW	1.10	5.60	3.96	1.12

Descriptive Statistics Female (N=30)

	Min	Max	Mean	SD
Age	18.00	25.00	21.43	1.95
BCW	1.17	5.50	3.41	1.03

Table II Overall Data

	Frequency	Percent
Poor	2	3.34
Mediocre	3	5.00
Average	9	15
Acceptable	10	16.7
Good	11	18.3
Very Good	14	23.3
Attractive	5	8.30
Excellent	6	10.0
Total	60	100.0

BCW Judges Orthodontists

	Frequency	Percent
Poor	4	6.67
Mediocre	6	10.00
Average	4	6.67
Acceptable	13	21.67
Good	11	18.3
Very Good	13	21.67
Attractive	5	8.30
Excellent	4	6.67
Total	60	100.0

Table III
MALES:
BCW: Judges General Dentists

	Frequency	Percent
Poor	2	6.7
Mediocre	3	10.0
Average	4	13.3
Acceptable	5	16.7
Good	5	16.7
Very Good	6	20.0
Attractive	3	10.0
Excellent	2	6.7
Total	30	100.0

BCW: Judges Orthodontists

	Frequency	Percent
Poor	3	10.0
Mediocre	4	13.3
Average	2	6.7
Acceptable	6	20.0
Good	5	16.7
Very Good	7	23.3
Attractive	2	6.7
Excellent	1	3.3
Total	30	100.0

FEMALES:

Judges General Dentists

	Frequency	Percent
Average	5	16.7
Acceptable	5	16.7
Good	6	20.0
Very Good	8	26.7
Attractive	2	6.7
Excellent	4	13.3
Total	30	100.0

Judge Orthodontists (Females)

	Frequency	Percent
Poor	1	3.3
Mediocre	2	6.7
Average	2	6.7
Acceptable	7	23.3
Good	6	20.0
Very Good	6	20.0
Attractive	3	10.0
Excellent	3	10.0
Total	30	100.0

Discussion:

The study is based on a one factor relationship of buccal corridor width to the smile and aesthetics of the smile, and relates the opinions of the general dental practitioner to an orthodontist. The results were compiled independently, as no single judge was shown the ratings of any other included in this survey. Each photograph was evaluated by 15 orthodontists, and 15 GDP. An average was taken separately for the ratings of orthodontists and a separate average rating for the GDPs. The results of both these ratings were compared. The conclusion of the survey conducted from all the GDP and the Orthodontists was that almost all of them gave higher ratings to the smiles with lesser or minimum visible buccal corridors, as has been the opinion of many other authors before⁸. The pictures with a higher visible buccal corridor width were rated generally lower. There was a slight comparative variation in the results as some GDPs rated photographs of some females with slightly wider buccal corridors a bit higher as compared to the orthodontists. GDP were not as discriminating of the aesthetics as compared to the orthodontists.

The results indicate that the age had no impact on the perception of the buccal corridor, although there was a limitation in sample size, as most subjects were young adults. Gender however had a slight more impact on the judgment of the observer, as females received a slightly higher rating than males for the same calculated buccal corridor width corresponding to males. However, the difference was very minute, and not of much significance.

This study takes into account the measurement of the buccal corridor width from the 1st premolar, as compared to previous studies done by Hulsey⁵, who took measurements using as the point of reference of measurement of BCW. This was significant as the inter-canines width is usually not indicative of the maximum percentage of the visible dental compliment during a smile.

Emphasis must be made on the limitation of this study as it does not encompass the wide range of other factors that contribute to the aesthetics of the smile such as angulations and inclinations of the anterior teeth, the height of the clinical crowns, the gingival display during smile and others etc⁹⁻¹⁴. Also, as the photographic study is 2-dimensional, and is only representative of the smile of the subject at that particular moment, it may or may not be reproducible, and it may not be indicative of the spontaneous smile, which has a wider range of expression and thus the resulting visibility of the buccal corridor may be variable. It is hoped that in future studies regarding the

evaluation of smile aesthetics, 3D assessment of the dynamic nature of smile videos would be done to overcome these limitations.

Conclusion :

1. General Dental Practitioners and the Orthodontists both prefer smiles with minimum visible buccal corridors.
2. The GDP were less discriminative on smile esthetics related to BCWs than Orthodontists.
3. GDPs rated a few BCWs higher than orthodontists.
4. Age had no correlation to the ratings.
5. Females were assigned a slightly higher rating by the GDPs.
6. Buccal corridors had a strong impact on the smile aesthetics of all subjects.

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