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Incidence of Buccal Corridor Area Show during posed smile in patients reporting to Altamash Institute of Dental Medicine

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Abstract

Introduction: Smile aesthetics have become integral to diagnosis of an orthodontic patient. Many factors influence smile esthetics. Buccal Corridor Area Show (BCAS) during posed smile is considered to be an important factor effecting smile aesthetics.

Material and Methods: Sixty photographs were obtained from 60 subjects fulfilling the inclusion criteria. In each picture, right and left BCAS were measured in millimeters. Mean Buccal Corridor Area Show during posed smile was measured and compared with established mean values.

Results: Mean buccal corridor area show of the patients reporting to AIDM was 6.191 mm with a standard deviation of 1.634 mm. Mean buccal corridor area show of the patients with skeletal class I was 5.704± 0.880. No significant differences were observed between the contra lateral sides.

Conclusions: The Buccal Corridor Area Show during posed smile was compared with the mean established values. This can give a fair idea about its incidence in our population. BCAS during posed smile can be made a part of the problem list during diagnosis and treatment planning and means devised for its reduction.

Keywords: Esthetics, negative space; smile

Introduction

Numerous soft tissue analyses of the face[1-8] deal with the soft tissue profile in the sagittal plane of space. However, Arnett et al,[7,8] and Proffit[9] emphasized the importance of the esthetics in the frontal view. Therefore, it is necessary for orthodontists to move the focus from the sagittal plane to the frontal plane during evaluation of their patients when planning and assessing orthodontic treatment.[10] In addition, orthodontic patients are concerned with not only their static appearance but also with their dynamic appearances during conversation and smile.[11–15]

Smile is of two types one being the enjoyment or Duchenne smile and the other posed or social smile.[18,19] Humans have learned posed smile by the process of evolution.[20]The ''smile designing'' in orthodontic treatment is the social posed smile, which is known to be repeatable and reproducible.[12,21–24]

The buccal corridor area show is evaluated when considering a person's smile.[25-27] It is the space between the maxillary buccal teeth and the corner of the mouth, which appears as a black or dark negative space.[21,28] The narrow maxillary arch[13,14,29,30] and extraction in the maxillary arch[26] were thought to be causes of the buccal corridor area show. Still others suggested that the sagittal position of the maxilla and the palatal position of the upper molar crowns could be influencing factors on the buccal corridor area show. The width of the smile, upper arch, tone of facial muscles, position of the labial surfaces of the upper premolars, prominence of the canines and cant of an occlusal plane are all believed to influence BCAS during posed smile.

Different hard and soft tissue factors relate with the amount of buccal corridor space during mile.[31] Different variable were

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considered in the lateral cephalograms and posed smile photographs for the measurement of buccal corridor area show and correlation was ascertained. Hence proved that buccal corridor area show is a multi-factorial phenomenon and vertical pattern of a patient must b e considered for controlling the amount of BCAS during posed smile.

Daltro Eneas Ritter[26] established mean values of buccal corridor area show on both sides to be 6.68 ±1.99 mm. The purpose of this study was to quantify the mean BCAS during posed smile and the influence its magnitude had on the esthetics of one's smile. No such study is available in Pakistan, hence being the rationale behind this study.

Hence, the purpose of this study was to measure the mean value of buccal corridor area show during posed smile, in millimeters. This was ascertained in normal vertical pattern patients and its importance highlighted in terms of diagnosis and treatment planning.

Material and Methods

Sixty photographs of patients between the ages of 18 to 25 years were obtained. These were taken from the records of subjects reporting to outpatient department of Altamash Institute of Dental Medicine. Patients having complete permanent dentition, with the exception of third molars with good dental alignment in both arches, balance between the facial thirds and competent lip seal were included. Frontal photographs of the lower facial third were taken, including the nose tip and chin. The individuals were photographed with posed smile, seated in natural head positioned at a distance of 90 cm from the camera.[35-38] Pictures were taken in standardized environment under the same light conditions with Canon IXUS 200 IS (Japan) at 12.1 Mega pixels of resolution. After the photographs were taken, right and left negative spaces (RNS and LNS respectively) were measured following the method of Hulsey[39], Johnson and Smith.[40] A line was projected between the lip commissures (right and left cheillion points) and the maximum width of the mouth during smile was measured in millimeters.

An album was assembled with 60 black and white smile photograph prints showing only the mouth area including the lips, teeth and intraoral visible structures to avoid interference from other intra oral structures.

To verify the accuracy of measurements and the calibration of the investigations, NS measurements were achieved in millimeters on 10 photographs of the sample at two different time periods with a 15 day interval between them. Two series of photographs of 10 different individuals from the sample were taken at different time intervals (30 day interval) and were used in order to verify the reproducibility of the smile photographs. The bilateral NS were measured in millimeters and it was concluded that the individuals included in the sample repeated the same posed smile on the two time intervals.

Two weeks after the first evaluation of the album, examiners received a second album with the same photographs in a different arrangement. The mean of the two evaluations was used as a final esthetic grade for each photograph. This method of smile capturing has two major drawbacks. First, it is exceedingly difficult to standardize photographs due to differences in camera angles, distances to the patient, head positions and discrepancies between intra-oral and extra-oral photographic techniques. When cheek retractors are used for photographing the teeth in frontal occlusal view, the lens of the camera is positioned perpendicular to the occlusal plane. When the smile is photographed, the lens of the camera is positioned perpendicular to the face in natural head position, effectively shooting from above the occlusal plane.

Only normal angled, skeletal class I patients were included in the sample on the basis of lateral cephalometric radiograph tracings hence fulfilling the inclusion criteria.

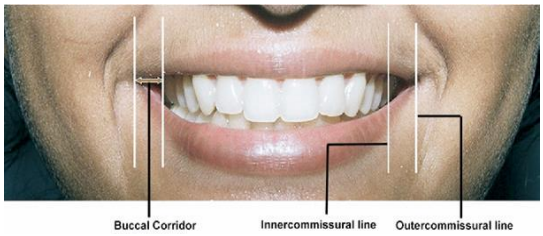

Figure 1: Buccal corridor area show measurement

Results

Mean ages of patients included in this study were 20.739 ± 2.0337. 45% of the patients were male with mean age of 20.629 ± 1.944 and 55% were females with mean age 20.848± 2.124 (Table 1 and 2). Mean buccal corridor area show of the patients was 6.191± 1.634 (Table 3). The results reveal that mean buccal corridor area show of the patients in this sample was comparable to the established norms (5.704± 0.880, Table 4).

Table I: Mean age of patient's according to the gender

Gender	Mean	Sd
Male	20.629	1.944
Female	20.848	2.123

N=60

Table II: Distribution of patients according to the gender

Gender	Frequency	Percentage
Male	27	45%
Female	33	55%

N=60

Table III: Mean Buccal Corridor Area Show

Mean	Standard deviation
6.6191	1.634

N=60

Table: 4: Mean Buccal Corridor in Skeletal (Class I and Normal angle case)

Mean	Sd
5.704	0.880

Discussion

Most of the information on the buccal corridor area size or dimensions in the literature is based on clinical opinions of experts whereas scientific studies that can address this issue, yield controversial outcomes. Consensus has emerged regarding broader smiles with narrower buccal corridors which are considered to be more attractive. Conversely, others have noted that buccal corridor width does not impact the attractiveness of a smile.[26] Isiksal et al[41] reported transverse characteristics to be of little significance in smile attractiveness whereas argument exists that negative space influences smile esthetics only when they becomes excessively wide.[26]

Another factor that can influence the results of available evidence is the light conditions under which the photographs are taken. Teeth are positioned posteriorly where buccal corridors become evident and here the light becomes reduced. This can cause gradual darkening and consequently less visibility of these posterior teeth. The less-illuminated the photograph, the larger will be the buccal corridors. This is one of the confounders in such non-standardized studies.

Smile esthetics are fundamental to diagnosis and treatment planning in the present era. There has been a shift away from complete denture prosthetics, since dentistry has become conservative and people keep their teeth longer. Consequently, a full smile might no longer be perceived as a "denture smile." Additionally, the ethnic mix in the United States has changed dramatically. These trends could be redefining the influence of buccal corridor area show on esthetics.

Differences in the results of available evidence can also be attributed to sampling techniques. Digitally altered smiles used as a sample generally suggested that the size of the buccal corridor has an influence on smile esthetics, whereas original smiling photographs when judged for attractiveness rendered different results and no correlations were found between buccal corridor sizes and smile attractiveness.[14,18,21]

There is a threshold level for a digital alteration to become detectable, because both

dentists and laypeople notice mainly the extremes.[42] The size differences of the buccal corridors in patients may be more subtle, whereas the changes performed in the computer are more dramatic. That might be the reason for opposite results between such studies.

The mean buccal corridor area show during posed smile for the total sample was 6.6191 ± 1.634 mm for each side which is comparable to that of other studies. Different variables [31] might affect the buccal corridor area show during posed smile since it is a multi factorial phenomenon. To control its extent, it is necessary to observe the vertical pattern of the face, since long faces have a tendency for lesser buccal corridor area show. Conclusively meso-cephalic faces were selected in the present study to exclude this proven confounder (Table 5).

Conclusions

The mean buccal corridor area show of skeletal class I patients was found to be comparable to the available norms. Many factors influence the buccal corridor area show during posed smile with esthetic implications and must be planned accordingly while offering treatment to orthodontic patients.

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