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Original Research

Assessment of effect of different malocclusions on lip – tooth relationships during smiling and speech

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***ABSTRACT*:**
Background: The present study was conducted to assess effect of different malocclusions on lip – tooth relationships during smiling and speech. **Materials & Methods:** The present study was conducted on 85 subjects and were made to pronounce few words starting from 'che', 'fa', 'se', 'chee', 'tee' and 'mee'. The height and width of an upper central incisor and the height-to width ratio was calculated. Gingival display of the upper central incisor, interlabial gap, philtrum height, left and right commissure heights, smile width or outer commissure width and the smile index was recorded. Smile arc and most posterior maxillary tooth visible were recorded too. **Results:** Out of 85 patients, males were 30 and females were 55. Class I comprised of 10 males and 15 females, class II had 18 males and 34 females and class III had 2 males and 6 females. The mean buccal corridor ratios in posed smile arc in class I patients was 0.12, in class II was 0.15 and in class III was 0.16. In unposed smile arc, in class I patients was 0.11, in class II was 0.14 and in class III was 0.12. There was no- difference in poised and unposed smile arch patient, in class I and II whereas class III showed significant difference ($P< 0.05$). A significant contingency in the smile arc type between the posed and unposed smiles (Contingency coefficient: .702, $p < 0.001$). This means that the smile arc was the same among the posed and unposed smiles in about 75 per cent of the subjects. **Conclusion:** Authors found that the buccal corridor ratio during the posed smile was more than that during the unposed smile. The smile arc did not differ in different malocclusions.
Key words: Smile, Lips, Malocclusion

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INTRODUCTION

The revolution in the field of Orthodontics has significantly increased the number of patients desiring treatment for malocclusion.[1] The demand increases depending upon the skill of the orthodontist, need of the patient and self awareness. Effect of soft tissues on teeth and subsequently on the alignment is well understood. Thus assessing the exact soft tissue tooth relationship in important evaluate the outcome of orthodontic treatment.[2] It is mentioned in the books that it is very difficult to assess the forces acting on teeth from tongue inside and from lips and cheeks outside. The balance between both sides is of paramount importance to achieve better results. Tongue is highly muscular organ is capable of inducing excessive forces than cheeks.[3]

Recent researches have shown that facial charisma affects the way a human being is recognized by others. Mothers of attractive infants tend to feel good when others consider their kids smart and lovely. Thus there is need of being liked by all.[4] Children like to be called attractive. This halo extends from home to school. It can influence both teacher – student and student – peer relations and academic attainment. Similarly, physical attractiveness greatly affect the confidence of the individual where all admire the beauty resulting in boosting confidence of people. In workplace also physical beauty plays an important role. Attractive individuals tend to perform better than unattractive individuals with regard to perceived job qualifications, hiring decisions and future career success.[5]

There is great impact on the Oral health related quality of life (OHRQoL). Both adolescent patients and their parents expect orthodontic treatment to improve oral and dental function, health and aesthetics and to enhance self-confidence and the quality of their social life.[6] The present study was conducted to assess effect of different malocclusions on lip – tooth relationships during smiling and speech.

MATERIALS & METHODS

The present study was conducted in the department of Orthodontics on 85 subjects of malocclusion of both genders. All participants were informed regarding the purpose of the study and after obtaining their written consent the study was proposed to the ethical committee. Once their approval by taken, the study commenced.

Data related to participants such as name, age, gender etc. was recorded. All subjects were made to sit comfortably on chair with head straight and the camera was focused at the eye level positioned at the distance of 2 metres. All subjects were made to pronounce few words starting from ‘che’, ‘fa’, ‘se’, ‘chee’, ‘tee’ and ‘mee’.

They were also made to smile and then unsmile voluntarily and the movements of the lips were recorded. The width of an upper central incisor was measured after calculating the magnification of the recorded images with vernier caliper. All the data was shifted from camera to computer where with the help of movie maker software 9 frames were extracted from each video clip: the subject at rest, during the posed smile, during the unposed smile and during pronunciation of the sounds.

The height and width of an upper central incisor and the height-to width ratio was calculated. Gingival display of the upper central incisor, interlabial gap, philtrum height, left and right commissure heights, smile width or outer commissure width and the smile index was recorded. Smile arc and most posterior maxillary tooth visible were recorded too. Results were statistically analyzed. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Malocclusion	Males	Females	Total
Class I	10	15	25
Class II	18	34	52
Class III	2	6	8
Total	30	55	85

Table I shows that out of 85 patients, males were 30 and females were 55. Class I comprised of 10 males and 15 females, class II had 18 males and 34 females and class III had 2 males and 6 females.

Table II Assessment of buccal corridor ratios

Smile arc	Class I	Class II	Class III	P value
Posed	0.12	0.15	0.16	0.91
Unposed	0.11	0.14	0.12	0.57
P value	0.25	0.78	0.02	

Table II, graph I shows that mean buccal corridor ratios in posed smile arc in class I patients was 0.12, in class II was 0.15 and in class III was 0.16. In unposed smile arc, in class I patients was 0.11, in class II was 0.14 and in class III was 0.12. There was no- difference in poised and unposed smile arch patient, in class I and II whereas class III showed significant difference (P< 0.05).

Graph I Assessment of buccal corridor ratios

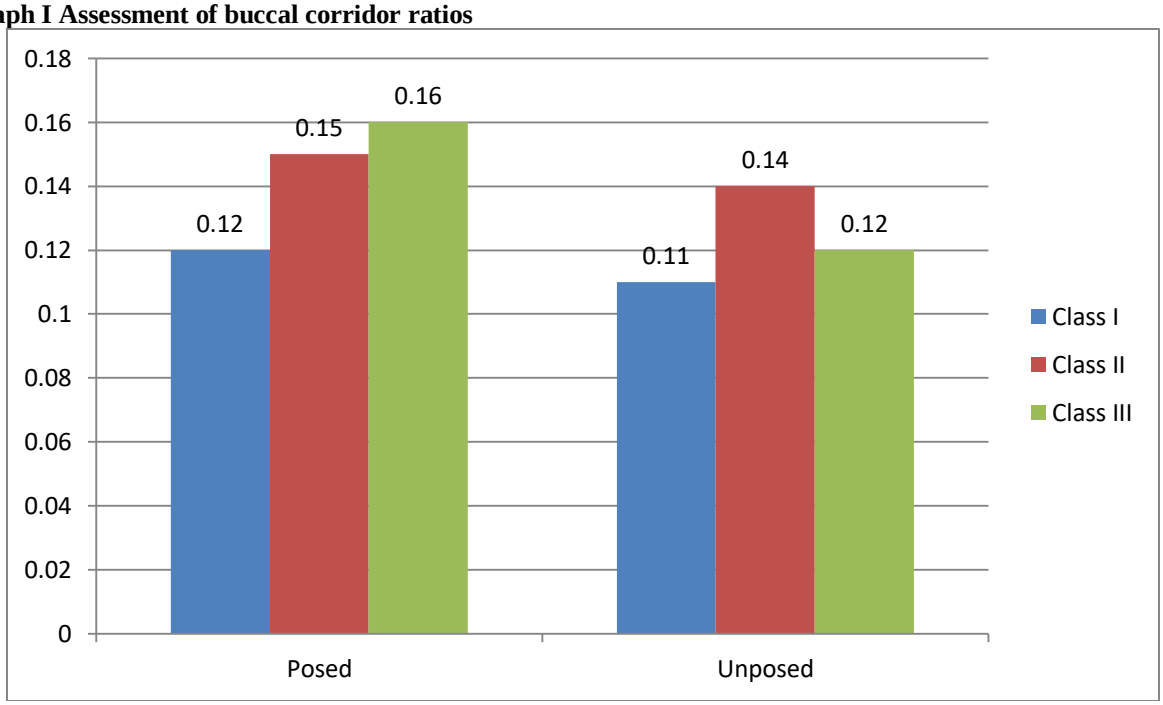

Table III Distributions of the smile arc during posed and unposed smiles

Posed smile arc	Unposed smile arc				Total
	Non definable	Consonant	Flat	Reverse	
Non definable	4	6	3	2	15
Consonant	0	22	8	0	30
Flat	0	2	20	3	25
Reverse	0	0	3	12	15
Total	4	30	34	17	85

P< 0.001

Table III shows a significant contingency in the smile arc type between the posed and unposed smiles (Contingency coefficient: .702, p < 0.001). This means that the smile arc was the same among the posed and unposed smiles in about 75 per cent of the subjects.

DISCUSSION

The motive of modern orthodontics is to improve the quality of life thorough the augmentation of the patients' smile and facial appearance. Patients demand is an attractive and pleasing appearance following orthodontic treatment. An attractive smile and appropriate lip – tooth relation during speech is highly demanded.[7] This has got social importance. Of the forces from the soft tissues, those from the tissues in the passive resting state are supposed to be more important than forces exerted upon the teeth during various functions such as speech and swallowing.[8] The present study was conducted to assess effect of different malocclusions on lip – tooth relationships during smiling and speech.

In present study, out of 85 patients, males were 30 and females were 55. Class I comprised of 10 males and 15 females, class II had 18 males and 34 females and class III had 2 males and 6 females. Rashed et al[9] in their study found non- statistically significant differences in

the upper central incisor display ratios among the malocclusion groups. The buccal corridor ratio in the posed and unposed smiles did not differ significantly among the malocclusions. First premolar in the posed smile and the second premolar in the unposed smile was most frequently visible last maxillary tooth. In each malocclusion group, the upper central incisor display ratio varied significantly among the nine frames and the buccal corridor ratio during the unposed smile was less than the ratio during the posed smile; although this was only significant in the Class II division 2 subjects. The smile arc was similar in all malocclusions.

We observed that mean buccal corridor ratios in posed smile arc in class I patients was 0.12, in class II was 0.15 and in class III was 0.16. In unposed smile arc, in class I patients was 0.11, in class II was 0.14 and in class III was 0.12. There was no- difference in poised and unposed smile arch patient, in class I and II whereas class III showed significant difference ($P< 0.05$).

Ackerman and Ackerman[10] stated that the buccal corridor should be measured from the inner rather than the outer commissures. In an unposed smile, despite the greater smile width, because the lips are stretched more, a larger part of the modiolus becomes visible and the inner commissures become more distinct and closer to each other. Nanda[11] attributed the variability of this space among different types of smiles to the buccinator muscle.

Thuer et al[12] conducted a study on 84 children with varying types of malocclusion where the relationship between lip strength and lip pressure was measured. There was no correlation between lip strength and lip pressure. Lip strength was lower in children with Angle Class II, Division 1 malocclusion than in children with Class I malocclusion. The lip pressure on the upper incisors, on the other hand, was higher in Class II, Division 1 than in Class I malocclusion, and was lowest in children with Class II, Division 2 malocclusion. The findings suggest that the pressure from the lips on the teeth is a result of the incisor position.

The shortcoming of present study is small sample size.

CONCLUSION

Authors found that the buccal corridor ratio during the posed smile was more than that during the unposed smile. The smile arc did not differ in different malocclusions.

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