CORRELATION BETWEEN UPPER LIP MORPHOLOGY AND PROCLINATION OF ANTERIOR TEETH IN PATIENTS REPORTING FOR ORTHODONTIC TREATMENT

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Abstract

Introduction: Orthodontic treatment is performed to enhance one's aesthetics and morphological harmony and also to improve the function of the oral and maxillofacial region. Soft tissue analysis has always been an integral important part of diagnosis and treatment planning. Lip position has become one among the foremost important soft tissue analysis because it influences the occlusion, tooth stability and facial aesthetics. The aim of this study is to find out the relationship between upper lip morphology and proclination of anterior teeth

Materials and methods: It is a single centered retrospective study conducted in a private dental institution in Chennai. The samples were taken from the patients who reported to the dental outpatient department from June 2019 to February 2021. The patient records were reviewed and analyzed. Inclusion criteria included age, gender, lip competency and lip length and proclination of anterior teeth. Proclination of teeth and lip competency were all done through photographic evaluation. Patients in the age group of 18-25 years, with proclination of teeth in the upper arch and class I malocclusion were selected. A total of 513 patients were included in the study.

Results and discussion: A total of 513 patients' data were collected according to the criteria. Out of 513 patients 45%(238) were males and (54.2%) 278 were females. Patients in the age group of 18-25 years were selected. However, most of the patients concentrated within a small range with the highest percentage being 24 years(15.6%) and 22 years(15.6%) followed by 23 years(14.8%). 57.7% patients had competent lips, 30.8% had incompetent lips and 11.5% had potentially competent lips. 64.3% of patients had short lip and 35.7% had normal lip length. Class I malocclusion and proclination in the maxilla were seen in all 513 patients. Chi square test was done to assess the relationship between lip competency and Lip length (p<0.05 was considered statistically significant).

Conclusion: According to our study it was suggestive that there is a relationship between the upper lip morphology and proclination of anterior teeth

Keywords: Smile, lip, competency, proclination, malocclusion, innovative technique

INTRODUCTION:
The most common reason for orthodontic treatment is to enhance one's aesthetics and morphological harmony and also to improve the function of the oral and maxillofacial region(1). Although ideal occlusion should remain the first functional goal of orthodontics, the esthetic outcome is additionally critical for patient satisfaction and thus is important to the general treatment.(2)

Smile is one among the foremost effective means by which individuals convey their emotions(3).The appearance of the smile is of considerable clinical importance and among one of the key criteria by which patients judge the success of their own orthodontic treatment. This is often why the smile is an integral part of the diagnosis and planning and a key point within the treatment objectives in orthodontic care(2,4–6). Clinical assessment should include an evaluation
of the soft tissue at rest and during function because the morphology of the soft tissues themselves may be a major factor in determining the general facial profile(7). Majority of orthodontic literature and diagnosis is predicated on patient’s profile and lips at rest while analyzing photographs and or X-rays(8–10).

Soft tissue analysis has always been an integral important part of diagnosis and treatment planning. The nose, lip and chin are the main components of the soft tissue profile. Various soft tissue analyses are developed to assist clinicians to quantitatively evaluate the facial morphology. Among this, the position of lips profoundly alters the selection of treatment. Orthodontic treatment plan can alter the lip position. Lip position has become one of the foremost important soft tissue analyses because it influences the occlusion, tooth stability and facial aesthetic(11). Lip could be competent, incompetent or potentially incompetent. Lips are competent if a lip seal can be maintained with the muscles of facial expression in relaxed position and mandible in resting (endogenous) posture. With competent lip morphology, the lips are habitually in touch with one another at rest. Potentially competent lips are competent but protruding incisors prevent the lips from coming together . In this case, when the upper incisors are retracted and the overjet is reduced, an anterior seal is achieved in the rest position. When the lips remain parted during the relaxed position of muscle of facial expression and mandible is in rest position it is called incompetent lip. Lip incompetence is often caused because Lips may be abnormally short and thus inadequate to maintain lip seal. Lips may be normal size but there may increase vertical distance between their attachment. The identification of the etiology is kind of important for the success of the orthodontic treatment(12). Previous studies have shown that the lips and cheeks, instead of the tongue, are the foremost important environmental factors that determine teeth position(13,14). Soft tissue morphology and behavior have a genetic component and they have a big influence on the dentoalveolar morphology(15).

Our team has extensive knowledge and research experience that has translate into high quality publications(16-35). The aim of this study is to find out the relationship between upper lip morphology and proclination of anterior teeth.

MATERIALS AND METHODS:
The present study is a single centered retrospective study in a private dental institution, Chennai. The samples were taken from the patients who checked in From June 2019 to February 2021. Ethical clearance for this study was obtained from the institutional review board. The disadvantage of this study was it was not a multi centered study, trends and geographic location.

Two reviewers were involved in this study. The samples were taken from patients who checked in from June’19 to February’ 21. The patient records were reviewed and analyzed between this time frame. The data was collected according to the age group of 18-25 years, with proclination seen only in the upper arch and with class 1 malocclusion. A total of 513 patients have matched the criteria. Internal validity includes samples with proclination in upper arch, class 1 malocclusion and age group of 18-25 years. External validity is replication of results in different time periods. The data was collected, verified, tabulated and analyzed. The data was imposed on SPSS and the technique used to quantify the data was Chi square. The statistical significance value is set at 0.05.

RESULTS AND DISCUSSION:
A total of 513 patients’ data were collected according to the criteria. Out of 513 patients 45%(238) were males and (54.2%) 278 were females(Figure-1). The age group selected was 18-25 years in which the highest percentage was 24 years(15.6%) and 22 years(15.6%) followed by 23 years(14.8%)(Figure-2). 57.7% patients had competent lips, 30.8% had incompetent lips and 11.5% had potentially competent lips(Figure-3). 64.3% of patients had short lips and 35.7% had normal lip length(Figure-4). Class 1 malocclusion and proclination in the maxilla were seen in all 513 patients. Chi square test was done between lip competency and size of lip which showed p<0.05 which was statistically significant(Figure-5). The percentage of patients with potentially competent was greater in the patients with short upper lip than the normal group. Few studies showed that upper lips were protrusive or less protrusive when compared to other samples. This is due to the fact that soft tissue features are specific for each given race and ethnicity(11,36–38). Our study showed that
proclination of upper teeth caused changes in the lip such as the competency was affected, and lips were also short. Studies also suggest that inclination of upper and lower anterior relative to the palatal and mandibular plane, respectively, affects the lip positions (39). teeth are balanced by the tongue from the inside and by the lips and cheeks from the outside (40).

Fig-1: This graph shows the number of patients with proclination among different genders. X axis represents the gender, Male (Red-45.81%), Female (Blue-54.19%) and Y axis represents the Percentage of the study population.
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Figure 2: This graph shows the number of patients with proclination among different Age Groups. X axis represents the Age groups, and the Y axis represents the percentage of study population.

Fig-3: This graph shows the number of patients with different Lip competency. X axis represents the Lip competency, Competent(Blue-57.7%), Incompetent(Red-30.8%), Potentially competent(orange-11.5%) and Y axis represents the Percentage of the study population.
Fig-4: This graph shows the number of patients with different lip lengths. X axis represents the lip length, Normal(Blue-35.7%), short (Red-64.3%) and Y axis represents the Percentage of the study population.

Figure 5: This error graph represents the correlation between lip length and lip competency. X-axis represents the lip competency, and the Y axis represents the count. The blue color indicates Normal lips where 33.7% of the population have competent lips with normal lip length, green represents short lips where 23% of the study population have competent lips with short lips, 30.8% have incompetent lips and 9.5% have potentially competent lips. Chi-square analysis was done between lip competency and lip length, P value<0.05(p=0.00) which is statistically significant.
Table-1: This table shows correlation of Lip competency with lip length where chi-square analysis was done which shows P value<0.05 which is statistically significant.

Many studies have also recorded lip length which might be associated with proclination and malocclusion(1,41). Many studies compared the upper lip morphology with class 2 malocclusion and compared them with different malocclusion(1,12,42).

Limitations of the study include, single centered, no various ethnic groups involved, comparison done only with one type of malocclusion and only upper lip was involved

CONCLUSION:

According to our study it was suggestive that there is a correlation between the upper lip morphology and proclination of anterior teeth, but still Further studies can be done to assess the upper lip morphology with different type of malocclusion and different parameter can be added such as the length of the lip and can also be compared with different age groups.

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