

Assessment of Smile Measurements Between Different Types of Anterior Overjet Malocclusion

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ABSTRACT

Background: In orthodontic treatment, esthetics has traditionally been associated with profile enhancement. The present study was conducted to assess smile measurements between different types of anterior overjet malocclusion.

Materials & Methods: The present study was conducted on 60 patients with anterior overjet. The patients were divided into the following 3 groups according to their overjet dimension OJ: Group J1 (0–4 mm), Group J2 (> 4 mm), and Group J3 (< 0 mm).

Results: Out of 60 patients, males were 35 and females were 25. There was significant difference of arc ratio, upper lip height, upper midline, smile index, lower teeth exposure and inter labial gap between J1, J2 and J3 ($P < 0.05$).

Conclusion: Authors found that Smile characteristics differ between different types of malocclusion; the smile may be influenced by skeletal pattern or overjet.

Keywords: Complete Denture Hygiene, Oral health, Oral hygiene practices.

INTRODUCTION

In orthodontic treatment, esthetics has traditionally been associated with profile enhancement. Both the Angle classification of malocclusion and the cephalometric analysis have focused attention on the profile, without considering the frontal view.¹ Even though patients come to us mainly to improve

their smiles, the orthodontic literature contains more studies on skeletal structure than on soft-tissue structure, and the smile still receives relatively little attention.² So, the purpose of this article is to review the major components of the

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smile and discuss their impact on orthodontic diagnosis and treatment planning.³

The 'smiling line', described by Frush and Fisher as the curve that traces along the maxillary incisal edges and onwards to the canine cusp, has been shown to be important in assessing the harmony of the smile. The degree of harmony is assessed by evaluating the relationship between the smiling line and the curvature of the upper border of the lower lip. This relationship is designated as the smile arc.⁴

Ackerman et al⁵ have suggested that not all successfully treated orthodontic patients with excellent occlusal relationships and exemplary plaster models have acceptable esthetics when smiling. In traditional orthodontic treatment, orthodontists focus on teeth alignment, occlusal relationship, and function. Patients, however, are concerned about their facial esthetics, particularly smile esthetics. Most patients seek orthodontic treatment for esthetic purposes. Consequently, it is crucial for an orthodontist to be able to assess smile esthetics in a patient. The present study was conducted to assess smile measurements between different types of anterior overjet malocclusion.

MATERIALS & METHODS

The present study was conducted in the department of Orthodontics. It comprised of 60 patients with anterior overjet. The study was approved from institutional ethical committee. All were informed regarding the study and written consent was obtained.

Data such as name, age, gender etc. was recorded. Pretreatment and post-treatment posed smile photographs had been taken with the patient's eyes open and a natural-looking posed smile. The participants were divided into the following 3 groups according to their overjet dimension OJ: Group J1 (OJ, 0–4 mm), Group J2 (OJ, > 4 mm), and Group J3 (OJ, < 0 mm).

All pretreatment lateral cephalograms were traced using View box software. In all patients, frontal and lateral profile photographs were obtained. Results thus obtained were subjected to statistics. P value less than 0.05 was considered significant.

RESULTS

Table 1: Distribution of patients.

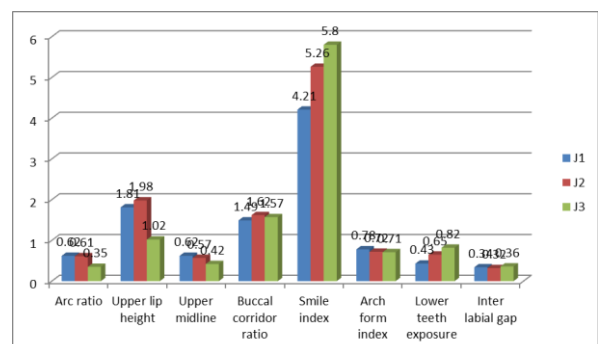
Total- 60		
Gender	Male	Female
Number	35	25

Table 2: Smile measurements between different types of anterior overjet malocclusion

Parameters	J1	J2	J3	P value
Arc ratio	0.62	0.61	0.35	0.01
Upper lip height	1.81	1.98	1.02	0.01
Upper midline	0.62	0.57	0.42	0.01
Buccal corridor ratio	1.49	1.62	1.57	0.07
Smile index	4.21	5.26	5.80	0.01
Arch form index	0.78	0.72	0.71	0.06
Lower teeth exposure	0.43	0.65	0.82	0.02
Inter labial gap	0.34	0.32	0.36	0.05

Table II, graph I shows that there was significant difference of arc ratio, upper lip height, upper midline, smile index, lower teeth exposure and inter labial gap between J1, J2 and J3 ($P < 0.05$).

Graph 1: Smile measurements between different types of anterior overjet malocclusion.



DISCUSSION

Obtaining a beautiful smile is always the main objective of any aesthetic dental treatment. After all, it is the beauty of the smile that will make the difference between an acceptable or pleasing aesthetic result for any given treatment. Nevertheless, in spite of its importance, the intrinsic

characteristics of the smile are little discussed. Much is said of the clinical consequences of dental procedures on the smile, but its intrinsic characteristics are not widely evaluated. These characteristics can sometimes be altered and sometimes not, as they are integral parts of the individual.⁶ As such, the field of dentistry has no reach over these characteristics, and can only make evaluations of them. The smile is one of the most essential human facial expressions that enhances the reward value of an attractive face. Goldstein stated that the smile ranks second only to the eyes as the most fundamental feature affecting facial attractiveness. An attractive smile helps win elections and sell products for companies.⁷ The present study was conducted to assess smile measurements between different types of anterior overjet malocclusion.

In present study, out of 60 patients, males were 35 and females were 25. There was significant difference of arc ratio, upper lip height, upper midline, smile index, lower teeth exposure and inter labial gap between J1, J2 and J3 ($P < 0.05$). Cheng et al⁸ included 106 patients who were treated with retention at the orthodontic department. Hard-tissue variables were measured using lateral cephalographic tracings, and nine smile esthetic variables were measured using facial photographs. The patients were divided into three groups according to their overjet (< 0 , $0-4$, and > 4 mm). Except the upper midline and buccal corridor ratio, all of the smile measurements differed significantly among the three groups before orthodontic treatment. Some of the smile characteristics were correlated with the cephalometric measurements in different types of malocclusion. The overjet was the major factor influencing the smile pattern in all three types of malocclusion.

Mah et al⁹ conducted a study and pre- and post-treatment maxillary dental digital models were virtually aligned via corresponding landmarks to the respective lateral cephalograms. Subsequent two-dimensional superimposition of the aligned cephalograms facilitated the three-dimensional superimposition of the pre- and post-treatment models. This process allowed the quantification of the curvature from a frontal perspective of the models. The change in curvature was then correlated with changes in the cephalometric inclination of the anterior occlusal plane (AOP),

functional occlusal plane (FOP), maxillary central incisor (U1), and the intercanine width. Orthodontic correction in this sample resulted in the clockwise rotation of the anterior occlusal plane (5.84 degrees), reduction in proclination of the incisors (-14.39 degrees), increase in intercanine width (2.48mm), and a corresponding increase in the curvature of the smiling line (6.83 degrees).

Camara et al¹⁰ evaluated six horizontal smile lines and their importance in obtaining the desired results in orthodontic treatments. The analysis of the six horizontal smile lines facilitates the understanding of the intrinsic characteristics that interfere in the aesthetics of the mouth. Moreover, a harmonization of these lines gives each professional a higher possibility of success in their treatments that include aesthetic objectives.

CONCLUSION

Authors found that Smile characteristics differ between different types of malocclusion; the smile may be influenced by skeletal pattern or overjet.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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