Analysis of Smile Characteristics among the Egyptian Population.

A
Thesis

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بسم الله الرحمن الرحيم

ربنا آتنا من لدنك رحمة و

هيئ لنا من أمرنا رشدا

صدق الله العظيم

الآية (10) من

سورة الكهف.

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To my little angles; Malak &Omar for making my life meaningful.

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INTRODUCTION.

Optimal facial esthetics is one of the principal objectives in orthodontic treatment; an individual dentofacial appearance influences facial attraction and relationships[1-3]. In this context orthodontic treatment enables individuals with dental abnormalities to improve their dentofacial esthetic pattern.

Although orthodontic treatment is based primarily on occlusal relationships; greater attention is now paid to enhancing dentofacial characteristics to produce optimal facial esthetics. Recently, orthodontics has experienced a "paradigm shift" to focus more on esthetics, with specific emphasis on the soft tissue.

Smile, defined as a facial expression characterized by upward curving of the corners of the mouth, is often used to indicate pleasure, amusement, or derision. The smile also influences a person's perceived attractiveness and is the cornerstone of social interaction. The reemergence of the soft-tissue paradigm in clinical orthodontics[4] has made smile analysis and designing key elements in diagnosis and treatment planning. Much attention is given in clinical examination to the display zone of smile, which is determined by lip thickness, inter-commissural width, inter-labial gap, and smile index[5].

The perception of esthetics varies from person to person and is influenced by personal experiences and social environments[6]. There can be differences of opinion regarding beauty between

laypersons and professionals[7]. Recent studies also confirmed that there is a difference in esthetic perceptions between orthodontists, general dentists, and laypersons[8-10].

It was suggested that to meet demands of treating all dimensions in orthodontics, our records must provide the information and documentation required in the new soft tissue-dominated treatment planning regimen. Facial and smile photographs are important diagnostic tools for smile assessment. Many clinicians tried to standardize the technique of photography to optimize the reproducibility and comparability of the facial and smile photographs, to be used in the analyses of smile characteristics.

Despite the large number of studies that analyzed smile from different aspects; and defined various norms in that issue; none was applied to the Egyptian population. From here came the idea of this study to explore the smile features among the Egyptian population, in an attempt to help considering smile design while planning treatment as well as other dental and soft tissue objectives.

REVIEW OF LITERATURE.

The subject of smile as it relates to communication and expression of emotion should greatly interest orthodontists. Incorporating morphometric data for smile characteristics helps quantifying the treatment plan and reducing the subjectivity in orthodontists' assessment of smile.

For sake of clarification light will be shed upon the following topics in this review of literature.

A. Smile classification
B. Smile characteristics.
C. Photography.

A. Smile classification.

The smile can be classified into unposed, and posed smile. The unposed smile is involuntary (i.e. not obligatory) and is induced by joy or mirth. It is dynamic in the sense that it bursts forth but is not sustained. All the muscles of facial expressions are recruited in the process, causing a pronounced deepening of the naso-labial folds, and squinting of the eyes.

A posed smile is voluntary and need not be elicited or accompanied by emotion. It is static in the sense that it can be sustained, natural, and it is agreed that the reproducibility of the posed smile is good[11]. The posed smile can be either strained "forced" where there is maximal upper lip elevation or unstrained which is voluntary, static, yet natural smile[12].

B. Smile characteristics.

In 1992, Sheldon Peck, Leena Peck, and Matti Kataja [12] performed a study to elucidate quantitatively upper lip-tooth-jaw relativity in the vertical dimension. Values for five linear dentolabial measurements were generated from male (n = 42) and female (n = 46) reference samples. In addition, three vertical skeletofacial dimensions and two vertical dental dimensions were recorded. A significant sexual dimorphism was found in the vertical lip-tooth-jaw relationship: the upper lip of the female subjects was positioned on average 1.5 mm more superiorly at maximum smile than the upper lip of the male subjects ($p < 0.01$). High smile lines appeared to be a female lineament, and low smile lines appeared to be a male lineament.

There was a significant sex difference in upper lip length: the male subjects exhibited a longer upper lip than the female subjects ($p < 0.001$). The mean difference was 2.2 mm. A similarly significant male-female difference was seen in the skeletal maxillary height measurement: the male sample showed a 2.2 mm mean vertical maxillary increase over the female sample ($p < 0.001$). Furthermore, a significant difference was found between the clinical crown height of the maxillary central incisors in the male and female subjects of comparable ages: the male group had longer central incisor crowns ($p < 0.01$).

G. William Arnett and Robert T. Bergman, in 1993[13], stated that when examining the smile posture, different lip elevations are observed in normal and abnormal skeletal patterns. Ideal exposure