



AN ANALYSIS OF FACIAL FORM AS A GUIDE FOR THE SELECTION OF MAXILLARY CENTRAL INCISORS

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Article Received on 23/11/2024

Article Revised on 13/12/2024

Article Accepted on 02/01/2025

ABSTRACT

Smile is the main component in presentation of a human being favouring social acceptance. The position, shape and colour of the permanent upper central incisors are important factors in determining a person's aesthetics when smiling. The aim of this study was to re-examine Leon Williams geometric theory for anterior teeth selection. 200 study subjects were randomly selected between age group 18 to 30 years with 100 males and 100 females were measured for 3 horizontal distances on the face. The results of the study indicate that William's theory may be helpful for the choice of artificial teeth in complete denture construction and the dental industry.

KEYWORDS: Smile, anterior teeth selection, aesthetics, complete denture.

INTRODUCTION

Aesthetics has a vital role in the success of a Prosthodontic treatment. The shape, shade as well as the arrangement of teeth should be based on individual requirements to achieve satisfactory aesthetics. The size and form of the anterior maxillary teeth are not only an aid to dental aesthetics but also to facial aesthetics since dentofacial morphology is closely related to the aesthetics of the face. So, restoring the anterior maxillary teeth in harmony with the facial appearance becomes an important goal of Prosthetic Rehabilitation. For the restoration of anterior teeth, many factors are to be considered, depending on the patient's expectations and the expertise of the dental practitioner. General dentists and Prosthodontists use some common principles regarding aesthetic features of teeth forms, such as gender characteristics and tooth, arch, and face form correlation.^[1] The aim of this study was to determine whether a correlation between tooth form and facial form exists.

MATERIAL AND METHODS

In the present study, 200 study subjects were randomly selected between age group 18 to 30 years with 100 males and 100 females were measured for 3 horizontal distances on the face: bitemporal width (Ft-Ft), bi zygomatic width (Zyg-Zyg) and bigonial width (Go-Go) and for 3 horizontal distances on the both upper incisors: cervical width (CW), contact point width (CPW) and incisal width (IW).

Inclusion criteria

- ☐ Presence of maxillary anterior teeth in good alignment.
- ☐ Subjects without any fixed, removable, orthodontic or orthognathic surgical treatment.

Exclusion criteria

- ☐ Subjects without caries, tooth fracture, restoration, gingival and periodontal diseases.
- ☐ Signs of tooth wear on their upper incisors.

Samples were collected by taking photos using a digital camera (Sony Alpha ILCE-6100Y 24.2 MP Mirror less Digital SLR Camera with 16-50 mm & 55-210 mm Zoom Lenses) placed at a distance of 1.10 m from the face and 20 cm from the maxillary central incisor. An intra oral photograph of the maxillary central incisors was taken using cheek retractors from a standardized distance parallel to central incisor teeth. The photographs were then transferred to a computer [Windows PC, Microsoft] having image editing software [Photoshop CC Adobe].

The outline forms of the face and the tooth on the photographs were traced using image editing software. Facial forms were determined by an outline tracing made of the temporal bones at the height of the hairline, temporal process of the zygomatic arches and the gonion.. Upper central incisor shapes were determined upon the relation by an outline tracing made around the

buccal surface of the tooth, which corresponded to the mesial and distal contours, the incisal edge and the cervical margin.

Face form classification: The face form was classified as follows.^[3]

- a) Square face – outline of the face form between the reference points showed no deviation from vertical.
- b) Tapering face – that converged from the temporal bone to the gonion.
- c) Ovoid face – that diverged from the temporal bone to the gonion.

Tooth form classification: A diagram of perpendicular lines was placed on the tooth form and the tooth in each quadrant was classified as follows.^[4]

- a) Square incisor tooth – mesial and distal proximal surfaces are parallel for at least half of the cervicoincisal length of the crown.
- b) Tapering incisor tooth – mesial and distal proximal surfaces converge from incisal to cervical.
- c) Ovoid incisor tooth – mesial and distal proximal surfaces are biconvex.

The respective percentages were calculated and the results were tabulated after statistical analysis using Chi-square test for association.

RESULTS

The square face form 65% predominated in males followed by ovoid 19% and tapering 16% face forms when compared with the ovoid face form 56% predominated in females followed by square 31% and tapering 13% face forms. The square tooth form 52% predominated in males followed by ovoid 29% and tapering in 19% tooth forms when compared with the predominant ovoid 49% in females followed by square 23% and tapering 18% tooth forms. The Chi-square test values were found to be highly significant with a p value < 0.001.

DISCUSSION

The concept of tooth selection in Complete Denture Prosthodontics has changed from basic to the philosophy of creating the effects of sex, personality and age. Since, most of the time an edentulous patient reports for complete denture treatment without any definitive information about his lost natural teeth. It has become necessary to look for some craniofacial landmarks and derive the information on the size of the natural teeth through biometry so that the anterior teeth selected are in a pleasing proportion to the face. The shape and the size of the artificial teeth selected should not exhibit extreme characteristics, but harmonize with the face and profile of the patient.^[5]

The tooth shape is strongly influenced by heredity, gender and the function of each tooth. For example, the shape of the incisor teeth in men is square with a square distal angle, while in women the tooth shape is more oval

with rounded distal angles. Ovoid tooth shape is a characteristic of individuals with an ovoid-shaped face, while teeth with a square shape are characteristic of individuals with a square-shaped face.^[6,7] Leon William quoted by Fenn, stated that the shape of the upper central incisors has a close relationship with the facial shape. However, according to some authors, this statement is still unscientific since there are also individuals who have an ovoid-shaped face, but have square-shaped teeth. The comparison of shape of maxillary central incisor only was done for the study since the form of lateral incisors and cuspids harmonize with the central incisors.

Although William's Law of harmony is the most accepted universally, the studies.^[8,9] till date among Indian population for correlation between the tooth form and the face form has not been highly defined. The present study was thus conducted based on William's method of classifying different tooth and face forms predominantly seen among Indian population.

The results of this study, in more than 90% of the examined population, revealed three forms of the face and three forms of the upper central incisor, which is similar to Leon Williams postulation. Although the forms of the upper central incisors and the face could be categorized into same invades forms, as first described by Williams, the matching of the outline of the face, when inverted and the form of upper central incisor has not proved to be good for the choice of artificial teeth upon the results of the present study.

However, there are certain shortcomings of the study. Photographs have been used in the study for determination of facial and tooth shape which have a large possibility of error due since the analysis is 2 dimensional. So it is recommended to use other tools such as using a 3D computerized system to determine the shape of the jaw arch more accurately. Another shortcoming of this study is that the race factor has not been considered. Therefore, it is necessary to do further research by taking into account the race factor. Also, combination tooth forms have also not been taken into consideration.

CONCLUSION

From the collated results of this study, it is apparent that there is a direct relationship of face-form and maxillary central incisor tooth form and that the selection of teeth based on the "law of harmony" has an actual validity. Still further studies with a large sample size with improvements of the shortcomings of present study are called for.

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