



Relationship between facial golden ratio and malocclusion in Mexican patients who attended the Orthodontics Clinic at Facultad de Odontología de la Universidad Tecnológica de México during 2009 with facial aesthetics criteria evaluated with Marquardt mask

Relación entre la proporción áurea facial y la maloclusión en pacientes mexicanos con criterios faciales estéticos evaluados con la máscara de Marquardt que acudieron a la clínica de Ortodoncia de la Facultad de Odontología de la Universidad Tecnológica de México durante el 2009

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ABSTRACT

Objective: To establish the frequency of patients selected as attractive showing the golden ratio on their faces according to the Marquardt mask and a class I molar relationship. **Methodology:** Observational research, transversal, retrospective and comparative study. Were collected 65 pictures (19 male and 46 female) from pre-orthodontic treatment patients at UNITEC Orthodontics Clinic with attractive faces according to beauty criteria established by the authors. Molar class was also evaluated among patients. **Sample size:** discretionary. **Sample type:** non-probabilistic. The pictures were shown to UNITEC Orthodontics graduate students who were given an evaluation sheet on which they graded patients from the least to the most attractive on a 1 to 5 scale. A study group was made from the results. Paint Shop Pro sc09960 version 7 was used to analyze the images by placing a Marquardt Mask on top of the patient's picture. **Results:** Out of the 65 pictures, 64.6% were described as attractive (42 patients) while 35.4% were found not attractive (23 patients). Out of the attractive patients, 57.1% were well proportioned according to the Marquardt Mask and 42.9% were not proportioned. **Conclusions:** The authors concluded that attractive patients are not always well proportioned. They also don't present an Angle class I molar relationship.

RESUMEN

Objetivo: Establecer la frecuencia con que los pacientes atractivos seleccionados muestran una proporción áurea (según la máscara de Marquardt) en sus rostros y clase molar I. **Metodología:** Investigación observacional, estudio transversal, retrospectivo y comparativo. Se reunieron 65 fotografías (19 hombres y 46 mujeres) pretratamiento ortodóncico de los pacientes de la Clínica de Ortodoncia de la UNITEC con rostros atractivos, de acuerdo a los criterios de belleza de los autores de esta investigación. De estos se evaluó también su clase molar. **Tamaño de la muestra:** por conveniencia. **Tipo de muestra:** no probabilístico. Las imágenes fueron mostradas a estudiantes del postgrado de Ortodoncia de la UNITEC, a quienes se les dio un formato con escala del 1-5 en donde calificaron desde el paciente menos atractivo hasta el más atractivo. A partir de estos resultados formamos nuestro grupo de estudio. El programa Paint Shop Pro Dsc09960 Versión 7 se utilizó para analizar las imágenes; en él colocamos la imagen del paciente y encima de ésta, la máscara de Marquardt. **Resultados:** De las 65 fotografías, 64.6% fueron consideradas atractivas (42 pacientes), y el 35.4% no fueron atractivas (23 pacientes). De los pacientes atractivos, el 57.1%, estaba proporcionado según la máscara de Marquardt y el 42.9% no se encontraba proporcionado. **Conclusiones:** Se concluyó que los pacientes atractivos no siempre estarán proporcionados, ni tampoco presentarán una clase molar I de Angle.

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Key words: Golden ratio, Marquardt mask, Angle molar relationship.

Palabras clave: Proporción áurea, máscara de Marquardt, clasificación molar de Angle.

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INTRODUCTION

One of the main objectives in current orthodontics is aimed to correct every alteration that implies a deviation of what are considered aesthetic dentofacial normal values. Obviously, this implies the establishment of such normal values which in turn, may present variations due to different kinds of diverse conditions. Among the most preferred are the social and cultural conditions, closely linked to the susceptible population for receiving orthodontic treatment in a given area.

In spite of criteria differences amongst different populations as well as orthodontic professionals, in recent years there seem to be a certain tendency to follow a series of aesthetic ideals established mainly in the western developed countries. These are facts that affect not only the orthodontic treatment objectives but those of many other medical disciplines related to aesthetics and whose professions are being taken to levels of complexity never imagined before.

Dentofacial aesthetics has been the primary center of attention among the most prominent orthodontists for the past 50 years, although the way to approach it has been adapted to the characteristics of each epoch.¹

Thus, orthodontic treatment which initially pursued a correct alignment of the teeth varied and widened its objectives to other neighboring structures both skeletal and soft tissues.

Currently, the great influence of the media as transmitters of aesthetic fashions and trends is decisive in the behavior of the consumer society, which makes people become more careful with its aesthetic appearance since, conscious or unconscious, they know that the image they offer to the rest of society has a direct proportional impact to their own social value.²

Physical beauty has been one of the major concerns of the mankind and it really is a difficult concept to define due to the subjectivity of the observer as well as to the fact that this is a concept in constant evolution or change in function of the different eras and cultures, fashions, etc.³

The so-called golden ratio or divine proportion are terms that express a set of theories, based on the mathematical, geometrical and physical laws, closely related to concepts of harmony and beauty for mankind, both in terms of their visual perception as to its psychological acceptance.

This proportion –denominated by the Greek with the symbol phi (ϕ)– has a value of 1:1 and seems to have very significant biological implications.

In fact, there are many natural phenomena that follow the principles of proportionality of the golden proportion, the golden triangle or the golden rectangle. At the same time, it seems to be linked to the guidelines for growth and optimal function. Because of all this, it can be used as a guide or support with regard to objectives of harmony and balance to perform treatment plans. Probably, these proportions represent what we would like to achieve once orthodontic treatment of the corresponding malocclusion is completed.

It is, therefore, a kind of philosophy about aesthetics that presents a few guidelines, but does not impose rigid rules that can be used as a panacea of the problem.

There seems to be an agreement between the general population's concept about acceptable facial aesthetics and that of orthodontists based on normal occlusion. While there are notable differences between subjects considered having harmonious and balanced dentofacial aesthetics, the analysis of many of their features shows the presence of the abovementioned golden proportion, both dental and facial from the frontal and anteroposterior plane.⁴

As to the teeth, it can be observed that the mesiodistal size of the lower central incisors keeps the same proportion with the upper central incisors. Similarly, such relationship is maintained between the distance from the distal right lateral incisor to the distal left lateral incisor in relation to the central incisors in the upper arch; the same is true between the width of the first premolars and the lateral incisor. This relationship can often be altered in any of the three types of malocclusion. An adequate maxillary arch form will also exhibit the same relationship between the intercanine width and the intermolar width, measured from mesial of the upper right first molar to mesial of the left molar. The same thing happens in the mandible between the distance that connects the canine's distal surface in relation to the one that connects the buccal grooves of the first mandibular molars. Finally, the same relationship is observed between the maxillary intercanine width and that of the lower incisors. All this refers to dental arches considered normal, harmonious and balanced.

Regarding the soft tissue aesthetics, both on the frontal view as well as the profile, the presence of the golden proportion may be observed among the most representative parts of what usually is the center of attention of any interlocutor, that is, eyes, nose and mouth. While analyzing the frontal projection of the face, it can be observed in relation to the transverse dimensions of the

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