



**ORIGINAL RESEARCH PAPER**

**Medical Science**

**DENTOMAXILAR DISCREPANCY AND CROWDING. LITERATURE REVIEW**

**KEY WORDS:**

<b>Javiera Rojas Donaire</b>	Universidad Finis Terrae
<b>Montserrat Valenzuela Yáñez*</b>	Universidad Finis Terrae *Corresponding Author
<b>María Jesús Zárate Piffardi</b>	Universidad Finis Terrae

**ABSTRACT** Dentomaxillary anomalies are alterations in the spatial relationships between teeth teeth and their maxillary bone bases that in most cases “result from a relative discrepancy between the size of the teeth and the bones, regarding the analysis of the discrepancies, we can find that the teeth could be associated with the appearance of diastemas (in case the discrepancy is positive), crowding (when the discrepancy has a negative value) or a discrepancy in tooth size, called a discrepancy of Bolton. This review emphasizes the importance of including these measurements in the diagnosis in order to avoid a result with a poor predictable future.

**INTRODUCTION**

Dentomaxillary Anomalies (DMA) correspond to a group of alterations of the spatial relationships between the teeth, and of these with the maxillae; these ones manifest clinically as malocclusions. These, “are usually significant clinically variations between the differences in the normal fluctuation of growth and morphology ”(1) and that, in the majority of the cases, “result from a relative discrepancy between the size of the teeth and the bones; or of a disharmony in the development of the maxillary bone bases ”, there are predisposing systemic, hereditary and congenital nature, its etiology is multifactorial, affecting the form, function and aesthetics of the stomatognathic system (2).

The dentomaxillary discrepancy refers to the relationship that exists between the thickness that holds your teeth and their mesiodistal width. When the discrepancy is negative, the sum of the width of all teeth is larger than the available bone size, in these cases it is when produces dental crowding, that is, there is not enough space for its correct location in the bow. On the other hand, when the discrepancy is positive, the width of the teeth is less than the size of the alveolar bone available, so there is plenty of space and diastemas appear. (3)

**THEORETICAL FRAMEWORK**

The dentomaxillary discrepancy is defined as the difference between the available space and the space necessary in the dental arch (4) and will give the degree of crowding of each patient (5). Various authors have argued that individual or group tooth discrepancies could be associated with the appearance of diastemas if the discrepancy is positive. When the discrepancy has a negative value we will know that there is a lack of space to accommodate the teeth (crowding) (5), or a discrepancy in the size of the teeth, called Bolton discrepancy (4). If the value is less than four millimeters, it could wear out interproximal and expansion of the bone bases. If the space is greater than minus five millimeters it must be consider a treatment of dental extractions or surgical orthodontic treatments (5). These conditions determine the absence of intercuspation, modifications in the projection, overbite and curve of Spee (6).

When this calculation results in zero, it is considered that the teeth will have the necessary and sufficient space to erupt, correctly occupying the space in the dental arch. Regarding negative values, Little in 1975 classified dental crowding according to its degree of severity, these are (7):

- Ideal alignment: 0 to -0.9 millimeters (mm)
- Minimum irregularity: -1 to -3 mm
- Moderate irregularity: -4 to -6 mm
- Severe irregularity: -7 to -9 mm
- Very severe irregularity: -10 mm or more

Dental crowding can be related to the width, shape and length of the arch, with teeth disproportionately large or a combination of factors. (8). Sometimes discrepancies can be seen in combination with other complications, such as agenesis, supernumeraries, teeth with fusion, gemination, etc.

Inadequate arch length with resulting crowding is a common occurrence with several negative sequelae. This should be considered in the context of aesthetic relationships between dental, skeletal and soft tissues. On the other hand, the lower incisors have a high rate of recurrence in rotations and crowding. (9)

The result of the dental discrepancy corresponds to the difference between the available space and the necessary space, being measured in mixed and permanent dentition.

These measurements are carried out in each study model individually, determining the need for space and space available, both for the anterior and posterior area (10).

The measurement of the available space can be done in two ways: measuring the dental arch by segments with the use of a dry point compass, and the other way measured with a wire on the occlusal surface at the contact points (11).

Detailed procedure below:

Mixed dentition:

Anterior available space	From mesial of a canine to the point of contact between both central incisors and then from here to the contralateral canine.
Anterior space required	If the teeth were erupted, they should be measured directly and separately. If they were only all four lower permanent incisors present we use the Tonn formula: Sum Upper Incisor = Lower Incisor Sum x 4/3 + 0.5.

Lateral available space	From mesial of the temporal canine to mesial of the first permanent molar. If the temporal canine is not present, it will be measured from distal of the permanent lateral incisor to mesial of the first permanent molar.
Side space required	Sum of the mesiodistal diameters that the canine and both premolars should have. The Tanaka Index was used, which predicts the space required for both upper and lower canine and definitive premolars. It is based on the lower incisor sum. Upper jaw = Sum lower incisor / 2 + 11 mm. Lower Maxilla = Lower Incisor Sum / 2 + 10.5mm.

**Permanent dentition**

Total Available Space	From mesial of the first molar to mesial of the contralateral first molar, following the line of contact points above the ridge using a flexible ruler.
Total Necessary Space	Sum of the mesio-distal diameters of the final teeth located from one first molar to another. They were measured individually

**DISCUSSION**

Treatment considerations may include: (9)

- 1.- Gain space for the permanent incisors to erupt and be positioned in a natural way through the extraction of temporary canines. The extraction of either temporary or permanent pieces in order to alleviate crowding should be done prior to a complete analysis.
- 2.- Orthodontic alignment of crowded teeth, expansion and correction of the arch length as soon as possible.
- 3.- Use support arches in mixed dentition until all the premolars and permanent canines have erupted.
- 4.- Maintain the original shape of the arch.
- 5.- Proximal stripping in enamel of the lower temporal canines to allow alignment of crowded lower permanent lateral incisors.

It is important to include the analysis of discrepancies in our diagnosis in a timely manner. The measurement of discrepancies must be included in our diagnosis, we must know what is our available space and the space necessary to be able to align the pieces in the arch and thus avoid complications in the future. (9)

**CONCLUSIONS**

In the orthodontic diagnosis, it is of great importance to verify the size of the teeth and the degree of dental crowding, since the treatment could vary due to the magnitude of it.

Crowding can be the result of a lack of space, which is why it is necessary to compare the available space and the space required to be able to align the teeth correctly (12,13).

If one aligns the teeth without previous analysis, in an arch that does not fit, protrusions, recessions and a result with a poor predictability future will occur. This is why our objective must be oriented towards making a correct diagnosis, in order to make the correct decisions in our treatment plan and avoid complications in our results.

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