



ORIGINAL RESEARCH PAPER

Dentistry

Dental Midline in Hemifacial Microsomia patients. Evaluation of the deviation.

KEY WORDS:Hemifacial Microsomy, midline.

Noemi Leiva V	Orthodontist from Universidad de Chile, Coordinator of Craniofacial Malformations Unit, Dentistry School, Universidad de Chile
M. Ignacia Sat	Dentist, Universidad de Los Andes. Intern in The Craniofacial Malformations Unit, Dentistry School, Universidad de Chile. 2015-2017
Francisca Carranza	Dentist, Universidad de Chile. Intern in The Craniofacial Malformations Unit, Dentistry School, Universidad de Chile. 2015-2017
Loreto Saavedra	Dentist, Universidad de Chile. Intern in The Craniofacial Malformations Unit, Dentistry School, Universidad de Chile. 2015-2017

ABSTRACT

Patients diagnosed with Hemifacial Microsomy type I present a series of dentomaxilar anomalies, like: deviation of the dental midline; that's why centering it, is a prior and complex objective of the multidisciplinary orthodontic treatment. The objective of this article is to present an evaluation of the dental midline's deviation in patients with Hemifacial Microsomy Type I, accompanied by a review of this condition, focusing principally on the results.

Introduction:

Dental midline is an imaginary vertical line located between the contact area of the two central incisors. There is an upper dental midline and a lower dental midline on each respective dental arch. The ideal goal is that both dental midlines coincide between them, and also with the facial midline, which confers symmetry, harmony and esthetics.

When the integrity of the maxilar or mandibular dental arch is preserved, there is a similar dissipation of the front component of occlusal forces on both sides; but when this continuity is interrupted due to a lack of dental alignment, by, for example, an infrapositioned canine or a palatine displacement of the lateral incisor(1), the transmission of the force is not the same on both sides, with the following effect inside the dental arch: mesialization of teeth, deviation of the dental midline, tooth rotation and aggravation of crowded teeth (2). In a lot of cases, patients with anterior crowded teeth can also present maxillary compression, accompanied by a loss of dental arch form, where besides correcting a lack of development of the transversal growth, it is necessary to center the dental midlines through orthodontic treatment. Patients with Hemifacial Microsomy type I frequently present the characteristics before mentioned, so it is necessary to correct the form of the dental arch and center the dental midlines to reduce the factors that affect occlusal stability and facial harmony(1)

The esthetics ideal according to related articles is the coincidence between the maxillary midline with the facial midline. However, there is an acceptable average of the deviation between dental and facial midline. In the study performed by Jayalakshmi NS (2013), the difference between dental and facial midline was measured and compared through scanner images in 200 young men and women between the ages of 18 and 30, with a complete front alignment. The results indicated that 44,4% of men and 55% of women showed a dental midline deviation between 0-1 mm, while 54% of men and 33% of women showed a deviation between dental and facial midline between 1-2 mm. The results also showed that 37% of men and 8% of women showed a deviation between dental and facial midline between 2-3 mm. Of the studied population 80% didn't show coincidence between maxillary and mandibular midlines, where most of the studied population showed a deviation between dental and facial midline in a range of 0-1 mm (3).

The Hemifacial Microsomy corresponds to a group of malformations that affects structures derivative to first and second branquial arch. It affects in spectrum, so its phenotype changes

according to the severity of each patient. Both terms describe different degrees of the same spectrum. The Hemifacial Microsomy affects primarily mandibular, buccal, orbital and auditive growth and it is the second most frequent craniofacial malformation, after cleft lip palate.

As for clinical characteristics, isolated microtia can be considered as a partial expression or microform Hemifacial Microsomy. It can present a variety of phenotypical variations from mild cases of unilateral microtia to severe cases with mandibular hypoplasia and affecting facial nerve and ear. (4)

Regarding facial asymmetry observed in patients diagnosed with Hemifacial Microsomy type I, Solem et al determined that this type of patients didn't present a significant difference between the growth of the left and right side of the mandible. Nevertheless, on the dysplastic side, we observed a decrease on the bone apposition of 1 mm per year and the direction of the condylar growth presented a more lateral and posterior direction than the control group. (5)

Nouri et al determined that in those mild cases of Hemifacial Microsomy, only the affected side could show less growth in the 3 dimensions. Nevertheless, on those severe cases, most times both condyles require a surgical intervention with costochondral graft. (6)

Birgfield et al determined that it is possible to use a method that combines photography analysis and a graphic tool of the OMENS classification to analyze the phenotypic characteristics of the patients with Hemifacial Microsomy. This method would be equivalent to a clinical analysis made by professional. However, the professionals that participated on the study indicated that it is more precise to evaluate mandibular hypoplasia throughout clinical analysis because the light and shadow of the pictures can affect the grade of facial asymmetry perceived. (7)

Method and materials:

The objective of this study was to measure the quantity of deviation of lower dental midline in patients diagnosed with Hemifacial Microsomy type I, attending the Craneofacial Malformations Unit of the Dentistry School of Universidad de Chile. 32 patients diagnosed with Hemifacial Microsomy type I, from a total of 145 patients attending the Craneofacial Malformations Unit, participated in the study. The coincidence of the dental midlines was determined through the study of models. The quantity of deviation on millimeters between the dental midlines was measured.

Results:

From a total of 32 patients with Hemifacial Microsomy type I, 7 patients (corresponding to a 21,8%) presented a coincidence between dental midlines. On 25 patients (corresponding to a 78,2%) there was no coincidence between dental midlines, obtaining different millimeters of deviation. (Table 1)

Concerning these results, it can be established that the mean of deviation corresponds to 2,0 – 2,5 mm. and the average was 1,95 mm. On the other hand, 20 patients, equivalent to 62,5% from the total, presented a deviation minor or equal to 2 mm.

On the study performed by Cardash et al (2004), regarding the abilities from the dentist to recognize the midline deviation, it was detected that in patients that presented less than 1 mm. of deviation, the observers could recognize the midline deviation in 14% of the pictures. In patients with deviation between 1-2 mm., the observers could recognize it in 37% of the pictures and in patients with deviation higher than 2 mm., they could recognize it on 83% of the pictures. It can be concluded that near half of the observers were incapable of detecting deviations lower than 2mm. (14) This affirmation is very positive regarding the results of this study though the average of the deviation was of 1,95 mm. and 62,5% of the patients presented a deviation higher than 2mm, equivalent to 20 patients.

Table 1: Quantity of dental midline deviation in patients with Hemifacial Microsomy type I.

Milimeters of deviaton	Number of patients
0	4
0,5	3
1	3
1,5	3
2	2
2,5	1
3	1
3,5	4
4	2
4,5	1
5	1
Total	32

Image 1: Pictures of dental midline deviation in patients participating the study



- A. Deviation of dental midline to the right.
- B. Deviation of dental midline to the left.
- C. Deviation of dental midline to the left.
- D. Coincidence between dental midlines.
- E. Desviación of dental midline to the right.
- F. Deviation of dental midline to the left.

Discussion:

The importance of esthetics and the continuity of maintaining stability and coordination between dental arches in a patient with Hemifacial Microsomy type I is transcendental in obtaining facial symmetry and enhancing the occlusal plane, which is a frequent diagnosis in this type of patients.

When the dental midline is severely deviated, it is necessary to make a note of this at the beginning of the diagnosis, in such a way that you can keep in mind this consideration during the entire treatment.

Conclusions:

In spite of the severity of the dental midline deviation that may appear on patients with Hemifacial Microsomy type I, it is of real importance to incorporate orthodontic treatment as soon as possible, due to the high percentage of severe malocclusions that may appear; like: facial and occlusal asymmetry, molar mesiocclusion, cross bite, diastemas on the dental midline, transversal, horizontal and sagittal deficiencies, which should be corrected to achieve a functional stability and proper esthetics to return facial symmetry. In this way, the principal objectives that must be accomplished are: occlusal stability, coordination between dental arches, esthetics and improvement of the lifestyle of this kind of patient.

The role of the orthodontist is of great importance in the treatment of these patients because an appropriate orthopedic-orthodontic management can reduce the chances of receiving future surgeries.

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