ORIGINAL RESEARCH PAPER

Dental Science

KEY WORDS:

CONDYLE OF THE TEMPOROMANDIBULAR JOINT VERSUS DENTAL MIDLINE IN PATIENTS WITH HEMIFACIAL MICROSOMIA TYPE I

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Introducción

Hemifacial microsomia (MFH) is a group of craniofacial malformations that affects different structures derived from the first and second brachial arch. This syndrome affects in the spectrum, which means that the phenotype depends on the severity of each patient. While Hemifacial Microsomia affects mainly mandible, bucal, ear and eye growth; Goldenhar Syndrome (GS) presents vertebral alterations and epiderbulbar dermoids. MFH is the second most frequent craniofacial malformation, after cleft lip palate.(1,2,3)

Hemifacial Microsomia's etiology is still unknown in the present; Poswillo in 1973, made an animal phenocopy in which he found bleeding from the estapedial artery, that produces an hematoma in the area near the two first braquial archs. The size of the hematoma and the injury in the resulting tissue would explain the morphology and the variations of MFH in the experimental models. This condition applies to humans too. (3)

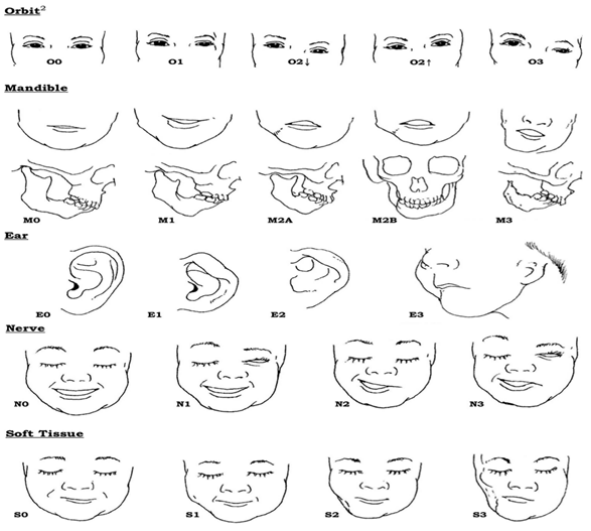
Mckenzie y Cryg (1955) also described that the effects of the estapedial artery can also produce alterations on the first and second braquial arch, since this artery also irrígates these arches. (3)

The isolated microtia is considered, in some series, as a partial expression or microform of Hemifacial Microsomía. MFH can present a phenotipic variety from mild cases with unilateral microtia to severe cases with microtia, hipoplasy of the mandible and compromises the facial nerve.(2, 4, 5, 6)

There are multiple classifications of this syndrome, where the O.M.E.N.S and O.M.E.N.S-Plus classification gather important investigation data, which facilitate the diagnosis. This classification is a radiographic evaluation of the Pruzansky classification, modified by Kaban. (7,8)

T 1: O.M.E.N.S Clasification (published in 1991) is an acronym of the abreviation for 5 principal characteristics of the Microsomia Hemifacial: (1)

Orbit	**O0:** Orbit in normal position and size	
	O1: Orbit with abnormal size	
	O2: Orbit with abnormal position	
	O3: Orbit with abnormal position and size.	
Mandible	**M0**: Normal mandible.	
	M1: The mandible and the glenoid fossa are small with a short mandibular ramus.	
	M2: The mandibular ramus is short and with an abnormal shape. Subdivsions A and B are based on a relative condyle position and temporomandibular joint. (TMJ)	**2a:** The glenoid fossa has an aceptable anatomic position in reference to the opposite temporomandibular joint. **2b:** The temporomandibular joint is displaced, in a lower, medial and frontal position, with a severly hypoplasic condyle.
Ear	**E0:** Normal ear.	
	E1: Slight hipoplasia, but all the structures are present.	
	E2: Absence of external auditory meautus with variable hypoplasia of the concha.	
	E3: Malpositioned ear lobe with absence of ear. The residual ear lobe is displaced into a lower and frontal position.	
Facia Nerve	**N VII0:** Facial nerve is not compromised.	
	N VII1: Upper compromise of the facial nerve. (temporal and cigomatic bracnh).	
	N VII2: Lower compromise of the facial nerve (buccal, mandible and cervical branch).	
	N VII3: All of the facial nerve's braches are affected. Other nerves can be affected, such as trigeminal, hipogloso and other craneal nerves, which are names by its own roman number.	
Soft Tissue	**S0:** There is no muscular or soft tissue deficiency.	
	S1: Minimum deficiency of soft and muscular tissue.	
	S2: Moderate deficiency – between the two ends, S1 and S2.	
	S3: Severe deficiency of soft tissue due to hypoplasic subcutaneous celular tissue and muscle.	



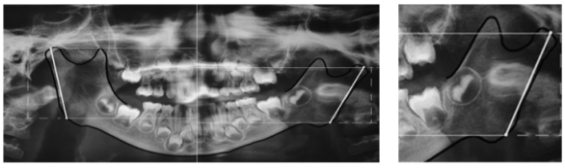
Methodology

An observational and descriptive study was carried out, in which 26 patients belonging to the Orthodontic Service with high complexity type I Hemifacial Microsomia diagnosis, from the Malformations Unit of the University of Chile. the size of the condyle was evaluated, classifying it in type 1A, 1B and 1C as per the proportions of their diameters.

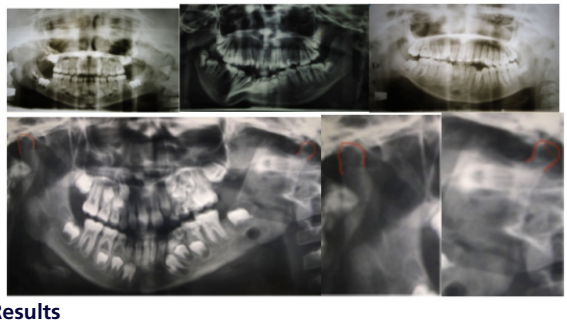
Patient's medical charts were analyzed, x rays, pictures and dental models, classifying them by OMENS-PLUS, evaluating the orbit (O), mandible (M), ear (E), cranial nerves (N), soft tissue (S) and extracranial alterations. Due to the fact that the actual Hemifacial Microsomia Clasification only divides this syndrome into 3 types, it was noticed that there was discrepancy between the size of the condyles that were classified in type I, so it was decided to measure the condyle of both temporomandibular joints and compare them, through the ortopantomography, to determine the transversal discrepancy in the normal side and the abnormal side and its relation with the dental midline. (9,10) According to this, the normal side of the mandible was divided into three measurements, and was compared to the opposite side. (11) Upon the results obtained in the transversal measurements, the patients were classified in type I: A, B and C:

- IA: Discrepancy lesser than 3/3 of the condyle's sagittal measurement.
- IB: Discrepancy between 2/3 and 1/3 of the condyle's sagittal measurement.
- IC: Discrepancy bigger than 1/3 of the condyle's sagittal measurement.

Picture n°1: Patient with MFH, which is classified as an OMENS 8: O1, M2B, E2, N1 and S2.



Picture n°2: Patient with MFH, in which you can observe the difference in the size of the condyles and mandible ramus.



Results

From a total of 126 individuals on the unit, 20,63% of them were diagnosed with Hemifacial Microsomia. From the ones diagnosed, 69,23% of them are female and 30,77% are male. 26,93% of the total of individuals belongs to capital city Santiago, Chile; while 79,92% belong to other regions of the country.

From the 26 individuals diagnosed wih Hemifacial Microsomia, 53,84% has Unilateral Hemifacial Microsomia type IA, while 23,08% has Hemifacial Microsomia type B and 23,08% has type C.

Evaluation of the ATM on Hemifacial Microsomia	Number of patients
Type IA	10
Type IB	4
Type IC	12
TOTAL	26

100% of the patients diagnosed with Hemifacial Microsomia present mandible alterations (26 patients), in order of frequency, it is as follows; the ear alterations (89,7%), soft tissue alterations (84,61%), orbit alterations (10,25%) and cranial nerves (10,25%).

Conclusions

Unilateral Hemifacial Microsomia type I is the most frequent of this anomaly. Nevertheless, from this classification there exists a number of variations from one individual to another, that's why classification type IA, IB and IC was created

In most of the cases that were presented, alterations on the mandible were more common, followed by soft tissue, ear, orbit and cranial nerves alterations. This affirmation agrees with international literature. The bone alterations were the most frequent extracranial alterations.

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