

New parameter for the evaluation of disgnathic patient's surgical planning: a preliminary report

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Abstract. – BACKGROUND: Indications for treatment of patients with maxillo-mandibular malformations have to be researched both in the severity of anatomical alteration affecting the face and psychological outcomes. Indeed, it has been underlined that patients decide to undergo orthodontic and orthognathic procedure mainly for aesthetical issues. Moreover the early combined functional and surgical treatment improves relationship skills in young adults.

Dealing with these “aesthetic” features pre surgical planning presents some additional challenges. Even if orthognathic surgery aims to the correct repositioning of skeletal bases but we must achieve complete patient satisfaction.

AIM: The Authors present a new parameter to be considered in the planning of patients who undergo orthognathic procedure being the restitution of the face the patient would have had without any pathologic mechanism with respect of the aesthetic features of the family.

MATERIALS AND METHODS: Authors identified a series of parameters discussed by Arnett et al and performed a clinical and photographic evaluation of these parameters, in latero-lateral view, directly on the relatives of the patients. A cephalometric analysis, was performed and a series of parameters has been taken into account.

CONCLUSIONS: It is very difficult to standardize universal parameters acceptable and applicable for every single case, considering that patient's awareness of the anatomical defect and post-surgical satisfaction don't relate to the correct cephalometric evaluation and the real aesthetic outcomes.

Key Words:

Clinical evaluation, Familiarity, Maxillo-mandibular malformation, Cephalometry.

Introduction

The correlation between face morphology and the ability of having social relationship has been widely investigated and studied by different Authors all over the years^{1,2}.

In particular it has been highlighted how the early orthodontic and surgical correction of the facial region improve relational skill in young adult patients³. The evidence that patients are moved to undergo surgery mainly for aesthetical issues testifies these considerations^{4,5}.

The restoration of stomatognathic apparatus functionality represents a secondary motivation.

Dealing with these “aesthetic” features pre surgical planning presents some additional challenges. Even if orthognathic surgery aims to the correct repositioning of skeletal bases but we must achieve complete patient satisfaction.

However, the awareness the patient has about beauty is influenced by many factors such as expressivity, cultural inheritance, historical period or hypothetical dominant models.

What really determinates beauty perception is above all the relation between facial proportions⁶. Our considerations are based on the following question: if orthognathic surgery shouldn't be performed for aesthetical reasons, being related to functional issues, what kind of parameter should we adopt?

With such a purpose the Authors present a new parameter to be considered in the planning of patients who undergo orthognathic procedure being the restitution of the face the patient would have had without any pathologic mechanism with respect of the aesthetic features of the family.

Materials and Methods

With the aim of quantify and objectify aesthetic features in common with the family the Authors identified a series of parameters discussed by Arnett et al⁷ in 1999. We performed a clinical and photographic evaluation of these parameters, in latero-lateral view, directly on the relatives of the patients.

We selected and evaluated the following values: upper lip angle [described by a line passing through

the most advanced point of the upper lip – ULA] and subnasale (Sn) and perpendicular to the natural horizontal head position (TVL); nasolabial angle [described by the lines passing through columella and ULA together with SN]; vertical maxillary dimension (Mx Height) [included between subnasale and upper incisor edge (UIE)]; vertical mandibular dimension (Md Height) [between soft tissue menton and lower incisor edge – LIE]; upper lip vertical dimension (ULL) [between Sn and Upper Lip Inferior – ULI]; vertical dimension of the lower lip (LLL) [between lower incisor edge LIE and soft tissue menton]; esposition of upper incisor [distance between ULI and UIE]; facial height [distance between soft tissue nasion and menton]. Some of these parameters are reported in Figures 1 A and B.

The comparative evaluation of these parameters between the patient and his relatives, can supply a model for a comparison with the face the patients would have had without pathologic growth mechanisms.

Discussion

The prevalence of dentofacial malformations is worldwide estimated about 20% of the population⁸. Indications for treatment of patients with maxillo-mandibular malformations have to be researched both in the severity of anatomical alteration affecting the face and psychological out-

comes. The evidence that patients are moved to undergo surgery mainly for aesthetical issues testifies these considerations⁴. In particular, it has been highlighted how the early orthodontic and surgical correction of the facial region improve relational skill in young adult patients³.

Is it possible to distinguish these motivations in “external”, given from the conviction that physical aspect might affect individual realization and “internal” meaning the personal experience of the physical defect⁹.

The necessity of pursuing beauty is given by the society itself which highly consider appearance and gives advantages to those individuals who improve their aspect¹⁰. Children their selves better interact with people with rounded features¹¹. However beauty, or what our mind perceives as nice looking, is strictly related to historical period, cultural inheritance and patient's perception of facial appearance¹².

The classic roman and Greek culture were based on proportions of the face and body¹³. It is very difficult to standardize universal parameters acceptable and applicable for every single case, considering that patient's awareness of the anatomical defect and post-surgical satisfaction don't relate to the correct cephalometric evaluation and the real aesthetic outcomes.

Many Authors assessed how patient's own profile perception is not always strictly related with the real three-dimensional position of the skeletal

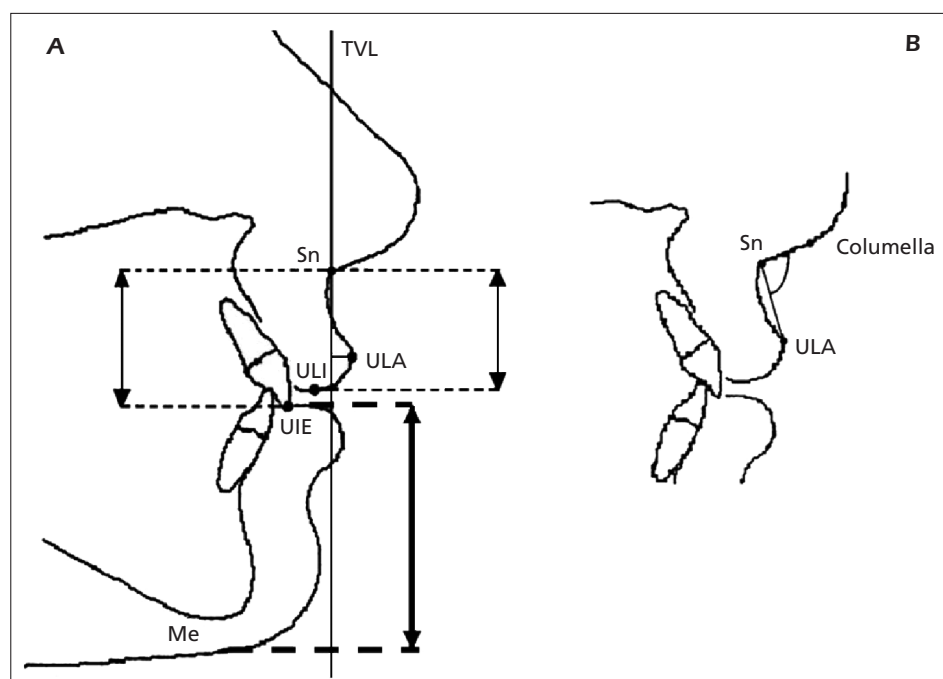


Figure 1. Graphic representation of cephalometric parameters evaluated in the study.

bases¹⁴, being more sensible for spatial alteration of position of the mandible¹⁵. At the same time the satisfaction of the patient is related to the severity of the treated malformation¹⁶, the more severe is the initial condition the higher will be the satisfaction.

An objective evaluation of beauty with mathematical parameters has been described too. In 1986, Cunningham¹⁷ evaluated 50 females half of which were finalists in international beauty contest and observed that wide eyes, a small chin and nose, high and prominent zygomas are common characteristics in the face of a beautiful woman. Moreover, he assessed that disharmony of these elements makes the subject perceived as different from normality.

Goldstein¹⁰, in 1998, considered some issues dealing with a nice smiling throughout the evaluation of face and dental arches features. Several papers underline the characteristics of pleasant nose and eyes⁶.

Regardless of the parameters we cited, an accurate surgical planning with the aim of morpho-functional recovery leads to a physiognomic rebalance with a viable aesthetic outcome. The viability of the result will be subjected to surgeon's aesthetic taste, the existence of supposed dominant models.

The evaluation of patient's somatic features and, moreover, of the family might be helpful for the surgical planning to give back to the patients the face they would have had without pathologic growth mechanisms, with respect of the peculiarities of family morphology.

Whenever the patient claims for a "beauty" oriented treatment it is possible to give the opportunity of undergoing aesthetic procedures with a modified orthognathic treatment in order to achieve the best aesthetic outcome.

It is out thought that this eventuality should be deeply and clearly explained in an accurate and detailed Informed consent.

Conclusions

We believe that to obtain a satisfying aesthetic and functional outcome for the correction of maxillo-mandibular malformations we must consider family features.

The final goal of the surgical treatment will deal with the restoration of a good occlusion and articular function, an appropriate neuromuscular asset, a harmonic skeletal bases position but also to the restitution of the faces the patients would have had if no pathologic growth mechanism occurred.

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