

Orthodontic-Surgical Treatment of Pattern II: Case Report

Tratamento Ortodôntico Cirúrgico do Padrão II: Relato de Caso Clínico

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Abstract

Pattern II may require different therapeutic approaches. When the face is at least acceptable, treatment may be restricted to dentoalveolar region. However, when the is unpleasant, correction should involve performing orthognathic surgery, in addition to the orthodontic treatment. And that is exactly the synergic union of all specialties - Implant, prosthesis, surgery and orthodontics - which ensures the construction of a more aesthetic and healthy smile and with significant face improvements. The aim of this study is to describe a case of an adult patient, black, malocclusions class II, severe mandibular deficiency, unpleasant face. The treatment involved descompensatory orthodontics, prosthetic rehabilitation, orthognathic surgery and finally aesthetic reanatomization the upper front teeth, which allowed the patient a normality condition of occlusion and face.

Keywords: Diagnosis. Malocclusion, Angle Class II. Orthognathic Surgery.

Resumo

As más oclusões do Padrão II podem demandar diferentes abordagens terapêuticas. Quando a face é no mínimo aceitável, o tratamento poderá se restringir a região dentoalveolar. No entanto, quando a face é desagradável a correção deve envolver a realização de cirurgia ortognática, além do tratamento ortodôntico. É exatamente à união sinérgica de todas as especialidades - Implante, Prótese, Cirurgia e Ortodontia – que garante a construção de um sorriso mais estético e saudável e com melhorias significativas na face. O objetivo desse trabalho é descrever um caso clínico de um paciente adulto, negro, Padrão II, deficiência mandibular grave, face desagradável. O tratamento envolveu ortodontia descompensatória, reabilitação protética, cirurgia ortognática e por fim, reanatomização estética dos dentes anteriores superiores, o que permitiu ao paciente uma condição de normalidade oclusal e facial.

Palavras chave: Diagnóstico. Má Oclusão de Angle Classe II. Cirurgia Ortognática.

1 Introduction

Individuals with Pattern II malocclusions have increased sagittal degree between maxilla and mandible, caused by mandibular deficiency, maxillary protrusion or association between these two factors. The prevalence of this disease in the Brazilian population represents 33.1% of the individuals in the deciduous dentition and 41% in permanent dentition. From these significant numbers, it seems reasonable to assume that the vast majority of orthodontic treatments involves the compensatory management and/or surgical treatment of this disease¹⁻³.

The subjective facial analysis is the main diagnostic resource to identify this kind of discrepancy. In pattern II individuals, the profile evaluation is more significant than the frontal, where usually the mandibular deficiency is not so apparent. The individuals classified as Pattern I in frontal view and II in profile have a better prognosis than those pattern II, in the frontal and lateral views, in which the imbalance is serious enough to be identified in the assessment of front

position due to its vertical effects³⁻⁵.

The face morphological evaluation reflects what is the primary etiological factor of the disease. When the the determinant is the mandible, the patient usually presents a lowered jaw-neck line and open angle, converging with the Camper's line. In the lateral face x-ray, there is a disproportion between the size of the body and of the branch. When considering how the primary etiologic factor and the maxilla, protrusion, it is noted an oblique insertion of the nose, which causes shortening of the middle third of the face and consequent, disproportion with the lower third. Radiographically, the maxilla protrusion is denounced by the posterior-anterior ascendancy of the palatal plane, divergent of occlusal plan⁴⁻⁶. The lower anterior facial height in Class II division first by mandibular deficiency⁷.

Regarding occlusal registration, the compensation when is present allows function. The dental compensation happens in the opposite direction to the skeletal error - undisputed condition in Pattern II and III malocclusions. In the upper

arch, it is observed a reduction in the arch perimeter with decrease of the angulation of the teeth and loss of vestibular tilt of the incisors. These compensatory characteristics present in the upper arch cause the decrease of the arch perimeter consequent reduction of horizontal overbite and vertical overbite increase. On the contrary, in the lower arch, there is an increase in the arch perimeter at the expense of greater angulation of the posterior teeth and vestibular tilt of the incisors. It is worth mentioning that the dental compensation is three-dimensional. In this context, justified by the sagittal skeletal error, there is a dentoalveolar atresia of the upper posterior teeth and expansion of the lower ones to enable a functional cusp-fossa relationship. The magnitude of these compensatory characteristics is directly related to the amount of skeletal error⁸⁻¹⁰.

The Pattern II malocclusions treatment will depend closely on the disease location, etiology and severity, in addition to the patient's age. Therefore, the treatment may be compensatory or corrective. The patients with facial pleasantness considerably compromised have primary indication for corrective treatment associated with orthognathic surgery. This therapeutic modality has the objective of promoting, in addition to the face balance, correction and stabilization of the occlusion, and normalization of masticatory, respiratory and phonetic pattern¹¹⁻¹³.

The orthodontic decompensation treatment with views to orthognathic surgery usually requires the partial or total elimination of the present dental compensation, in order to position the teeth closer to their ideal positions in their respective bone bases, to justify surgical movements suitable for each case. This interdisciplinary treatment requires a relationship of complicity between surgeon and orthodontist in order to define the amount of required decompensation^{2,3,7,11}.

The present study aims to present, by means of a clinical case, the treatment of an adult patient, Pattern II, severe mandibular deficient, unpleasant face, Class II total bilateral, associated with dentoalveolar upper and lower compensatory upper and lower atresia and strong retrusion with consequent crowding, which was submitted to the decompensatory orthodontic action associated to orthognathic surgery.

2 Case Report

The patient W.S.A., 31 years and 5 months of age, male sex, black race, sought medical care at Clinica de Especialização em Ortodontia da PROFIS (Bauru/SP) with main complaint difficulty breathing and chewing. The patient had atypical swallowing and breathing problems and allergies (bronchitis, rhinitis and allergy) and had already done treatment with an otorhinolaryngologist and Pulmonologist. In addition, he presented onychophagia as deleterious habit.

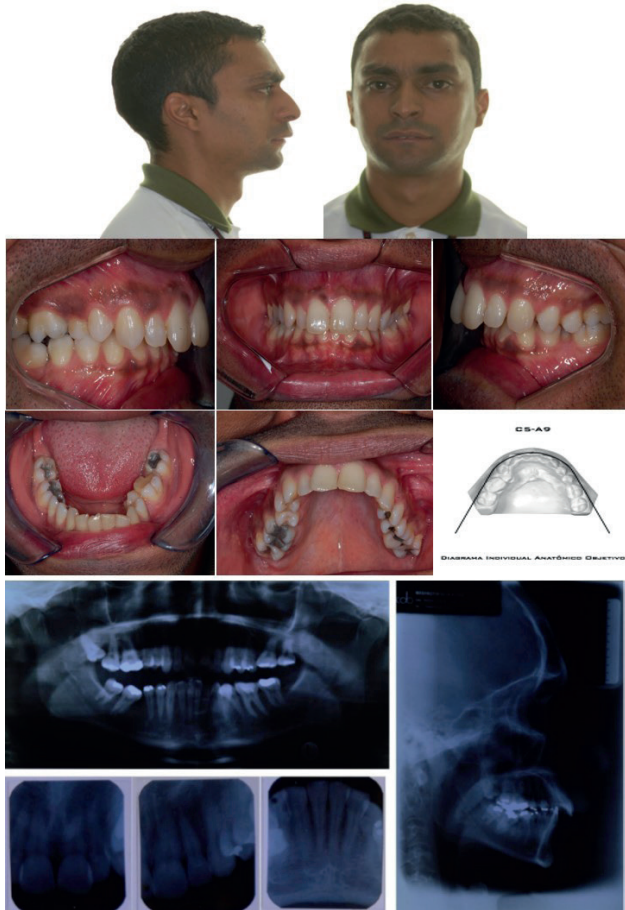
In the face qualitative assessment of the face, in front standard, symmetry and absence of passive lip sealment were observed. In the profile evaluation, the following characteristics were observed: very convex profile, short neck- jaw line, good nasolabial angle and deep mentolabial groove. The perioral musculature was hypotonic for lips (top and bottom) and normal to the mentalis muscle.

In morphological evaluation of the occlusion, the patient presented early absence of tooth 46 and fracture of tooth 36, which justified its extraction. The sagittal inter arches relationship was Class II total of both sides, with large overbite (12mm) and overjet (8mm) and severe lower posterior tooth crowding (tooth 35) by the important lower dentoalveolar retrusion, besides the upper dentoalveolar compensatory atresia. The upper dental midline was shifted to the left and the lower to the right.

The panoramic radiography evaluation confirmed the absence of tooth 46. Tooth 18 was impacted, with indication of extraction prior to the surgical procedure. In the periapical radiographs evaluation of the upper and lower incisors satisfactory periodontal condition was observed. In morphological evaluation of lateral face radiography, it was verified an increased maxillomandibular degree, with large mandibular retrusion and consequent reduction of airspace. The evaluation of the plaster models just confirmed all clinical data already evidenced in the occlusion morphological analysis.

The diagnosis was made after analyzing the morphological examinations of face, occlusion and x-rays: Adult Patient, Pattern II, severe mandibular deficiency and unpleasant face. The occlusal relationship was Class II (total) bilateral, with upper compensatory dentoalveolar atresia and lower dentoalveolar strong retrusion with consequent crowding in the posterior region (tooth 35), in addition to the early loss of tooth 46.

The prognosis for treatment was favorable, considering the achievement of orthognathic surgery of mandibular advancement and segmentation of the maxilla for the correction of transverse deficiency. The therapeutic goals were to give the patient an aesthetical occlusal condition and functionally better and a more balanced face, in addition to normalizing the respiratory pattern. The purpose of the descompensatory surgical orthodontic treatment was basically do an alignment and leveling avoiding protrusion, because the occlusal condition was already consistent with the sagittal facial error that the patient had, allowing the surgeon to change significantly, his facial relationships. For this reason the diagram chosen for the treatment was C5-A9⁴.

Figure 1 - Facial, radiographic and occlusion analysis.

Source: The authors.

To start the orthodontic treatment, extractions of teeth 18 (impacted) and 36 (fractured) were performed, and then bandage of teeth 16, 17, 27 and 28, followed by direct brackets bonding prescription Capelozza II in the upper arch. The following month, banding was performed on the teeth 37, 47 and 48 and the steel brackets direct bonding prescription Capelozza II²⁻⁵ in the lower arch.

For the correction of tooth 26 rotation lingual button on the palate of tooth 24 was bond and use of band of button to the attachment of the tooth 26. And the tooth 47 was verticalized with the use of TMA wire handle supported in a DTA.

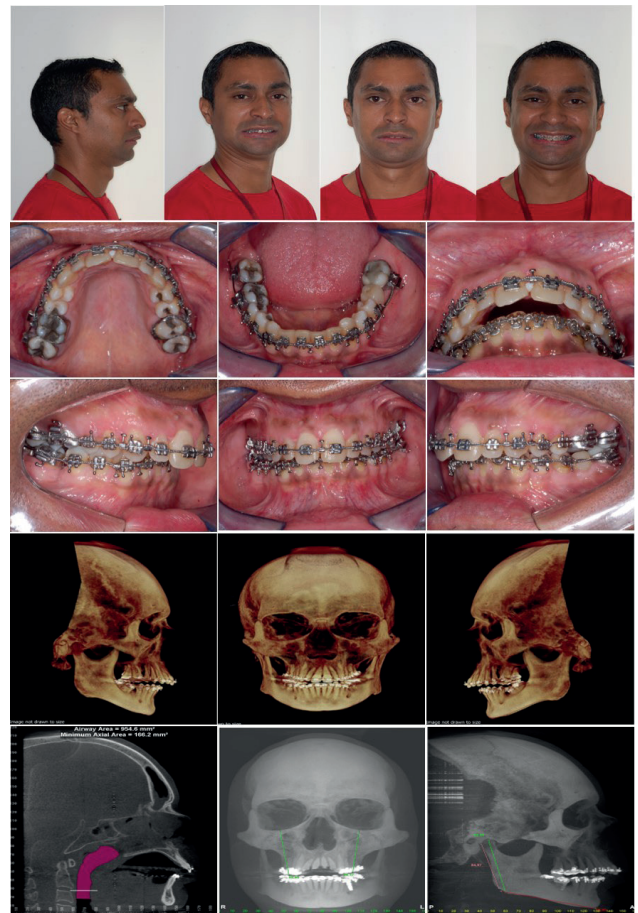
After six months of treatment, periapical radiographs were performed of the upper and lower incisors with purpose to assess the periodontal and root condition of these teeth and the biological cost inherent in the orthodontic treatment⁵.

The alignment and leveling of both dental arches continued with the gradual increase in the size of the steel wires up to .019" x .025". During this phase, folds were performed in both arches with the aim of obtaining the minimum of occlusal interference as possible. At this moment, the patient was referred to the completion of the implant of 36. At this stage, it is essential to each control, perform impression of

dental arches for study. These impressions allow the dynamic manipulation of the models and verification of inter and intra-arches, in addition to possible discrepancies in dental size, occlusal interferences, among others.

Impressions for work were done - for use of the surgeon - and installation of hooks, always adapted in mid lines of the leveling arches, in addition to the mesial and distal regions of the canines. This time, a face tomographic examination was requested (i-Cat, Imaging Sciences International) to assess the dentoalveolar and skeletal relationships after cardiac decompensation and assist in the surgical procedure planning.

The surgical procedure was planned in function of the skeletal and dental discrepancy, which involved mandibular advancement and further maxilla segmentation.

Figure 2 - Pre-operative analysis

Source: The authors.

Facial and occlusal gains verified in the postoperative period indicated the surgical therapy success. Two months after the surgical procedure, the surgical guide was removed - used as contensor of the obtained gain with the posterior maxilla segmentation - and replaced by a plate of posterior cross containment without clamp. The final phase involved folds in the leveling arches, and the need for a better distribution of space among the upper anterior teeth for aesthetics.

Figure 3 - Immediate postoperative and orthodontic finishing.



Source: The authors.

After six months of surgery stabilization, the fixed appliance was removed and referral of the patient to esthetics reanatomization of teeth 12 and 22. The patient has not performed the aesthetic procedure yet for lack of resources. Clear plates were used for containment.

Figure 4 - Facial analysis and final occlusion with containment plates type clear



Source: The authors.

2.1 Discussion

Patients with dento-facial deformities may report difficulties chewing and speech, temporomandibular disorders, preoccupation with body image and low self-esteem. Often, they seek ortho- surgical treatment due to the motivation to obtain remarkable improvement in the aestheti, functional and psychosocial aspects⁹.

The prospect requires that the professional approach of expectations of his or her patient to define the facial esthetics and smile improvement as the main treatment objective, and the direct assessment of the patient's face as his or her main diagnostic resource. It is worthy performing a morphological

face analysis, because the cephalometry is very poor to characterize a face. To the patient, definitely, no matter what the angles and proportions of his or her face are within a "pattern of normality" if this pattern does not suit his or her ethnic and individual characteristics. The main patient's aspiration is to be recognized as beautiful, or at least normal, by himself or herself and by society, which eliminates the unpleasant characteristics of smile and his or her face⁸.

There are three possibilities for treatment of Standard II malocclusions: manipulation of growth, masking the occlusion or combined surgical orthodontic treatment. -The prognosis is directly associated to the location, age, etiology and severity, consistent with the existing disease in each individual. The orthognathic surgery is well indicated when the deformity is severe, significantly compromising the patient's aesthetics with loss of self-image. Some of them accept the surgical option and others do not. This is due to the cost, but also to the fact of how patients see their skeletal discrepancies, especially those individuals pattern II and III, more marked discrepancies in the profile than in front, considering the fact that the individuals assess themselves in the frontal part^{3,6}.

Of the patients with skeletal errors sagittal, certainly those belonging to the pattern II suffers more with the skeletal discrepancy that the standard III. The first ones usually breath badly due to the of airspace reduction caused by mandibular retrusion , often leading to the development of the habit of oral breathing as a way to help the nasal breathing, besides being a development factor of snoring and apnea. However, the pattern III patients are more motivated to perform orthognathic surgery due to the aesthetic factor and not functional. The decreased maxillo-mandibular degree is more impactful aesthetically that the increased one, if we take as reference the Brazilian population. In Japan, for example, this would be otherwise.

It is up to the orthodontist the correct indication of orthognathic surgery to the facial pattern II patients without face complaint, despite the non harmony among the facial thirds, by functional limitation that the discrepancy offers. It is important to clarify this respiratory limitation to the severe pattern II patients, and refer the patient to an otolaryngologist doctor to work together with the ortho-surgical treatment.

The importance of the expertises synergy lies in the fact that, many times, the pattern II mandibular deficiency patients present severe obstruction of the airways, complaint of snoring, difficulty breathing while sleeping, fatigue, irritability and daytime sleepiness. They may develop obstructive sleep apnoa (OSA) that is characterized by repetitive episodes of superiors during sleep. Surgical treatment for mandibular advancement and palatine disjunction, enables large skeletal modification and proper and definitive solution to the OSA problem and other respiratory problems^{12,13}.

3 Conclusion

The orthodontic surgical treatment of an adult patient pattern II, severe dental mandibular deficiency requires a critical diagnosis, focusing on the patient's face, which will refer to a prognosis, meta-therapy and individualized treatment plan, associated to an interdisciplinary approach. It is worth mentioning that in addition to the face, occlusion and the respiratory pattern also suffer a positive impact with this approach.

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