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CASE REPORT

Orthodontic-surgical treatment of a class II division 1 patient. Case report

Tratamiento ortodóncico-quirúrgico de paciente clase II división 1. Presentación de un caso clínico

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ABSTRACT

The objective of this case report was to show the correction of a class II division 1 malocclusion in an adult patient. A female patient of 20 years of age attended the Orthodontics Clinic of the Division of Postgraduate Studies and Research of the Odontology Faculty at the National Autonomous University of Mexico. Her main reason for consultation was: «When I removed the wisdom teeth I was told that I could have orthognathic surgery but first I needed braces»; this in order to correct the dentofacial disharmony. Upon facial clinical examination, the patient presented a mesofacial biotype with competent lips; vertically she presented an increased lower third. Her profile was convex with deficient chin projection. Intraorally, the patient exhibited upper and lower crowding, molar and canine class II, considerably increased overbite and overjet as well as non-coincident dental midlines. The cephalometric diagnosis showed a skeletal class II due to maxillary protrusion. It was suggested an orthodontic-surgical treatment in three phases: presurgical, surgical and postsurgical. In the presurgical phase the patient was decompensated in order to prepare her for surgery. During the surgical phase, mandibular sagittal osteotomies were performed to advance the mandible in combination with an advancement genioplasty. During the post-surgical phase, ideal occlusal relationships were achieved in terms of canine classes, overbite, overjet, dental midlines and final detailing of the case. Through the treatment, the occlusion and facial harmony of the patient were improved.

RESUMEN

El objetivo de este caso clínico es demostrar la corrección de una clase II división 1 en un paciente adulto. Paciente femenino de 20 años de edad que acude a la Clínica de Ortodoncia de la División de Estudios de Posgrado e Investigación de la Universidad Nacional Autónoma de México. Su motivo principal de consulta es: «Cuando me quitaron las muelas del juicio me dijeron que me podían operar pero primero tenían que ponerme brackets»; esto para poder corregir la disarmonía dentofacial que presentaba. A la exploración clínica extraoral, se observa una cara mesoprosopa con labios competentes; verticalmente presenta el tercio inferior aumentado. Su perfil es convexo con una proyección deficiente del mentón. Intraoralmente, presenta apiñamiento dental superior e inferior, relación clase II molar y canina, la sobremordida vertical y horizontal considerablemente aumentadas y líneas medias no coincidentes. Su diagnóstico cefalométrico mostró clase II esquelética por protusión maxilar. El tratamiento propuesto ortodóncico-quirúrgico, en tres fases: ortodóncica prequirúrgica, quirúrgica y ortodóncica posquirúrgica. En la fase prequirúrgica se descompensó a la paciente para prepararla para la cirugía. En la fase quirúrgica se realizó una osteotomía sagital mandibular para realizar un movimiento de avance en combinación con una mentoplastia de avance. Durante la fase posquirúrgica se lograron relaciones oclusales ideales en cuanto a las clases caninas, sobremordida, resalte, coincidencia de líneas medias y el detallado final del caso. Con el tratamiento mejoró la oclusión y la armonía facial de la paciente.

Key words: Class II division 1, orthognathic surgery, sagittal osteotomies of the mandible, genioplasty.
Palabras clave: Clase II división 1, cirugía ortognática, osteotomía sagital mandibular, mentoplastia.

INTRODUCTION

Class II division 1 is one of the most difficult to correct malocclusions. It causes an important facial disharmony characterized by a deficient projection of the mandible, which leads to a convex profile, non-aesthetic facial proportions and occlusal disharmonies creating in the patient a negative psychological impact and a functional problem.[1,2]

The pathogenesis is of multifactorial origin but there are two fundamental components: genetics and extrinsic factors such as habits: digital suction,

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lip suction, abnormal deglutition, among others.[1,3] Treatment alternatives are different depending on the age of the patient and the severity of the case.

Orthognathic surgery is a good treatment approach for patients with severe skeletal discrepancies beyond the reach of conventional orthodontic treatment. Combined surgical-orthodontic treatment aims to obtain a more harmonious facial, skeletal and soft tissue relationship as well as to improve occlusal function. It has been demonstrated that facial and dental abnormalities that affect facial appearance may result in social disadvantage. Hence patients undergoing orthognathic surgery may experience psychosocial benefits and improve their self-confidence, facial image and social adaptation.[4]

A very important factor to be considered for surgical-orthodontic treatment is the paradigm of the soft tissues. It establishes that both the objectives and limitations of modern orthodontic and orthognathic treatment and are determined by the facial soft tissues, not by teeth or bones.[5]

As a result, the main objective of treatment happens to be the relationship and adaptations of the soft tissues, and not the ideal occlusion. It is admitted that for the patient to be able to benefit fully from treatment, ideal occlusion not always represents the fundamental aspect of a treatment plan. Functional occlusion, becomes the secondary objective of the treatment.[5]

CASE REPORT

A female patient, 20 years of age, attended the Orthodontics Clinic of the Division of Postgraduate Studies and Research of the Odontology Faculty of the National Autonomous University of Mexico. The main reason for consultation is «When I had my wisdom teeth removed, I was told that they could perform orthognathic surgery on me but first I had to have orthodontic treatment». This, in order to correct the facial anomaly that may be observed in the profile.

Clinical characteristics: at the facial clinical examination, in the front view the following characteristics were observed: a mesoprosope, round face, competent and thick lips and the facial midline coincides with the upper dental midline. The smile is neutral and shows nearly 100% of the clinical crowns of the upper teeth *(Figure 1)*. The vertical analysis shows the lower third increased in relation to the middle third. The lateral view of the patient shows a convex profile, with an obtuse (open) nasolabial angle and a decreased occipital-cervical distance *(Figure 2)*. Intraorally, the patient presented dental crowding, mismatched midlines, canine and molar relationship class II, an overjet of 6 and a 5 mm overbite *(Figure 3)*.

Radiographic records were taken prior to treatment, including panoramic and lateral headfilm radiographs and a CBCT *(Figures 4 and 5)*. In them, it was observed: 28 permanent teeth, good crown-root ratio (2:1), appropriate level of bony ridges, slight asymmetry of the mandibular ramus and no signs of TMJ disease.

The cephalometric analysis revealed a skeletal class II due to maxillary protrusion and retrognathia, transversal micrognathism, vertical excess of the maxilla, upper and lower proclination and a neutral growth pattern *(Table I)*.

Treatment plan: once the objectives of treatment were established, a consultation was held with the Department of Maxillofacial Surgery of the Hospital Juarez in Mexico. It was suggested a sagittal surgery for mandibular advancement and an advancement genioplasty. Presurgical orthodontic treatment was planned for the surgical preparation of the patient.

Presurgical orthodontic phase: extraction of lower first premolars. 0.022" x 0.028" Roth appliances were placed. Alignment and leveling is done with light archwires.

Presurgical decompensation was seen in the dental and facial features *(Figures 6 and 7)*. Second and third order movements were carried out with the following archwire sequence: 0.016" x 0.016" NiTi up to 0.019" NiTi x 0.025" stainless steel *(Figure 8)*. Prior to surgery radiographic records were taken *(Figures 9 and 10)* for cephalometric tracings and surgical prediction *(Figure 11)*. Measurements and analysis were performed with the Dolphin Imaging 9.0 program. Surgery of models and the fabrication of the necessary occlusal splints

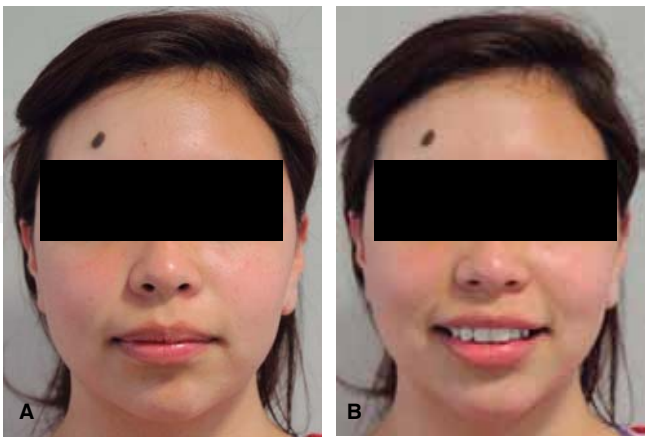

Figure 1. Pretreatment extraoral photographs: **A.** Front view. **B.** Smile.