

Case Report

CLASS II DIVISION 1 MALOCCLUSION MANAGED WITH KLOEHN HEADGEAR- A CASE REPORT

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ABSTRACT:

Class II Division 1 malocclusions are described as having labially inclined maxillary incisors, an increased overjet with or without a relatively narrow maxillary arch. The vertical incisor overlap may vary from a deep overbite to an open bite. We reported a case of class II div I managed with fixed appliances and Kloehn headgear appliance in a 12 years old male patient.

Key words: Class II Division, Fixed appliances, Kloehn headgear

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INTRODUCTION

Class II malocclusion is a very frequent orthodontic problem, affecting about 33% of the population, with a mandibular retrusion in almost 80% of patients.¹ Due to the difficulty in assessing this aspect using cephalometry, aesthetic evaluation is commonly used to diagnose retrusion of the mandible.²

Class II Division 1 malocclusions are described as having labially inclined maxillary incisors, an increased overjet with or without a relatively narrow maxillary arch. The vertical incisor overlap may vary from a deep overbite to an open bite.³ This is consistent with the attention paid to the correlation between an orthodontic treatment and an aesthetic result, intended not only to obtain a good occlusion but also and above all to achieve an optimal final aesthetic. Facial aesthetic improvement is the main reason why patients look for orthodontic treatments.⁴ In addition, young patients' parents want an enhancement of the facial, dental and dento-facial aesthetic of their kids. It is an important goal for clinicians too, which is why they keep it in

great consideration while planning treatments. With Class II Division 1 or 2 malocclusions, the molar relationship may be unilateral or bilateral. Unilateral cases are classified as a "subdivision" of the affected side. For the interested reader.^{5,6} The present study reported a case of class II div I in 12 years old male patients.

CASE REPORT

A 12 years old male patient visited the department of Orthodontics with chief complaint of sticking out upper front teeth. Patient presented with good general health upon initial examination. Past medical and dental history was non-contributory. Patients' parents revealed that patient had the nocturnal habit of teeth grinding and naso-oral breathing pattern. Clinical examination showed no dental wear, nor changes in tongue posture at rest or in function. The opening and closing movements of the jaw showed normal range, with no deviation and no noise, and the permanent dentition was complete, with the maxillary

right canine almost fully erupted. Molar relation found to be class II bilaterally. Presence of deep bite with mandibular incisors touching the palatal mucosa, severe overjet of 10.5 mm, accentuated curve of Spee and coinciding upper and lower midlines.

Panoramic radiograph showed the appropriate process of root formation of permanent teeth, and the presence of third molars, in the early stages of formation. Cephalometric analysis showed a skeletal Class I pattern ($ANB = 2^\circ$ and $Wits = 0$ mm) and a slightly decreased lower third of the face ($SN-GoGn = 30^\circ$ and $FMA = 22^\circ$). Mandibular incisors were well positioned ($1-NB = 25^\circ$ and 4 mm), while maxillary incisors were severely proclined and protruded ($1-NA = 52^\circ$ and 15 mm), being responsible for the decrease in the interincisal angle ($1/1 = 102^\circ$). A Kloehn headgear appliance (KHGA) along with orthodontic fixed appliance was used to distalize maxillary premolars and canines, and retract maxillary incisors. Following the treatment, class II relationship was corrected, and molar and canine Class I relationships were achieved, with appropriate overbite and overjet obtained.

DISCUSSION

Class II malocclusions are generally described as having either a dental, skeletal, and/or functional components or characteristics. Although these components will be discussed separately, it needs to be emphasized that they are often expressed at the same time and to various degrees.⁷ Patel⁸ evaluated the dental arch form during the transitional dentition of children with Class II malocclusions who did not undergo orthodontic treatment. The Class II sample was divided into four subgroups: Class II Division 2; Class II borderline between Division 1 and 2; Class II Division 1 with a “V” shaped maxillary arch; and Class II Division 1 with flaring and spacing of the maxillary incisors. No appreciable differences were present between normal and Class II individuals in absolute arch length and width. Anterior arch length was found to increase markedly during the transition period for all Class II types, except the Division 2 group. Overbite and overjet increased in the untreated Class II Division 1 cases and only excessive overbite increased in the Division 2 cases. Chhibber⁹ found the shape of the mandibular dental arch to be very similar in all four categories of Class II malocclusion, but the maxillary dental arch was wider in the Division 2 cases. We reported a case of class II div I managed with fixed appliances and Kloehn headgear appliance in a 12 years old male patient.

There are several studies that have described appliances able to determine increases in mandibular growth, thanks to a mandibular propulsion. In subjects with mandibular retrusion near their growth peak, functional bite-jumping devices are advisable. In subjects with

Class II division 2 malocclusion, before using functional equipment, a preliminary phase to advance the upper retroclined incisors is required.¹⁰ One possible treatment for Class II patients with mandibular retrusion is the Herbst appliance. Based on the “Bite Jumping” principle, this device acts by stimulating the condylar growth and remodeling of the glenoid cavity into a lower and forward position. In this way, a correction of the dental relationships and an improvement of skeletal harmony are possible. Although aesthetic improvement is the patient’s primary goal, few studies have investigated the perception of profile and soft tissue improvements resulting from functional therapy.¹¹ Filho et al¹² evaluated the posttreatment and long-term anteroposterior and vertical mandibular changes in skeletal Class II Division 1 patients (ANB angle $\geq 5^\circ$) treated with Kloehn cervical headgear. The sample consisted of 40 patients (18 males, 22 females, average age 10.5 years at pre-treatment [T1], 13.5 years at posttreatment [T2], and 23.5 years at post-treatment [T3]) treated with cervical traction with an expanded inner bow (4-8 mm) and a long outer bow bent upwards off the horizontal 10° to 20° in relation to the inner bow. The force applied averaged 450 g, and the recommended use of the appliance was 12 to 14 hours per day, with monthly adjustments. The Student *t* test was used for comparison between stages. Results showed that during treatment no significant change was found in the mandibular plane angle, but a significant decrease was detected at T3. Kloehn cervical headgear was efficient in the skeletal Class II correction. The superimposition of tracings suggests that much of the treatment effect occurs when the mandible is displaced forward. Skeletal Class II correction with Kloehn cervical headgear was found to be stable over the long term.

CONCLUSION

Authors found significant improvement in profile of the patients, hence concluded that Kloehn cervical headgear is an useful option in class II div I patients.

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