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Facial Changes in Patients with Class II Malocclusions Treated with The Carriere Motion Appliance

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ABSTRACT

Introduction: There are no published studies on the facial changes that the Motion Appliance can produce in Class II growing patients and this report provides results of this procedure.

Patient concern: The patient's main concern is "proclined upper teeth.

Clinical findings: The patient presents with Class II division I malocclusion with excessive overjet, convex profile and short neck-chin distance.

Primary diagnoses: Class II division I malocclusion.

Interventions: Bilateral Motion Appliances for the first phase of treatment and upper and lower fixed appliances (non-extraction) for the second phase of treatment.

Conclusion: This case report shows the facial and cephalometric changes in a Class II malocclusion treated with the Motion Appliance in the first phase of treatment and reports on 49 patients 5-12 years-old, treated with the Carriere Motion Appliance in the first phase of treatment.

INTRODUCTION

Class II malocclusions represent about 35% among all malocclusions treated by orthodontists around the world, varying from region to region [1].

Many times this condition generates facial disharmony that can be linked to significant skeletal and dental discrepancies and results in facial imbalance in the patient [5].

The early diagnosis and treatment of these patients often helps to correct these discrepancies in the active stage of growth, causing facial changes that restore facial harmony and stable occlusal results.

DIAGNOSIS AND TREATMENT PLAN

An 11-year-old female presented with a Class II, division I malocclusion; 8 mm of overjet, deep bite, lower midline deviation of 2 mm to the right side, mild lower crowding and upper incisor flaring (Figure 1). Profile evaluation found a normal nasio-labial angle, short neck-chin length and a prominence of the upper lip over the lower (Figure 2).

Cephalometric analysis indicated that the Class II malocclusion was predominantly skeletal and related to anteroposterior mandibular postural retrognathia (Figure 3).

The panoramic x ray showed all permanent teeth erupted.

The treatment plan was designed using bilateral Carriere Motion Appliances in Phase I and fixed appliances for the second phase of treatment.

Figure 1

Figure 2:

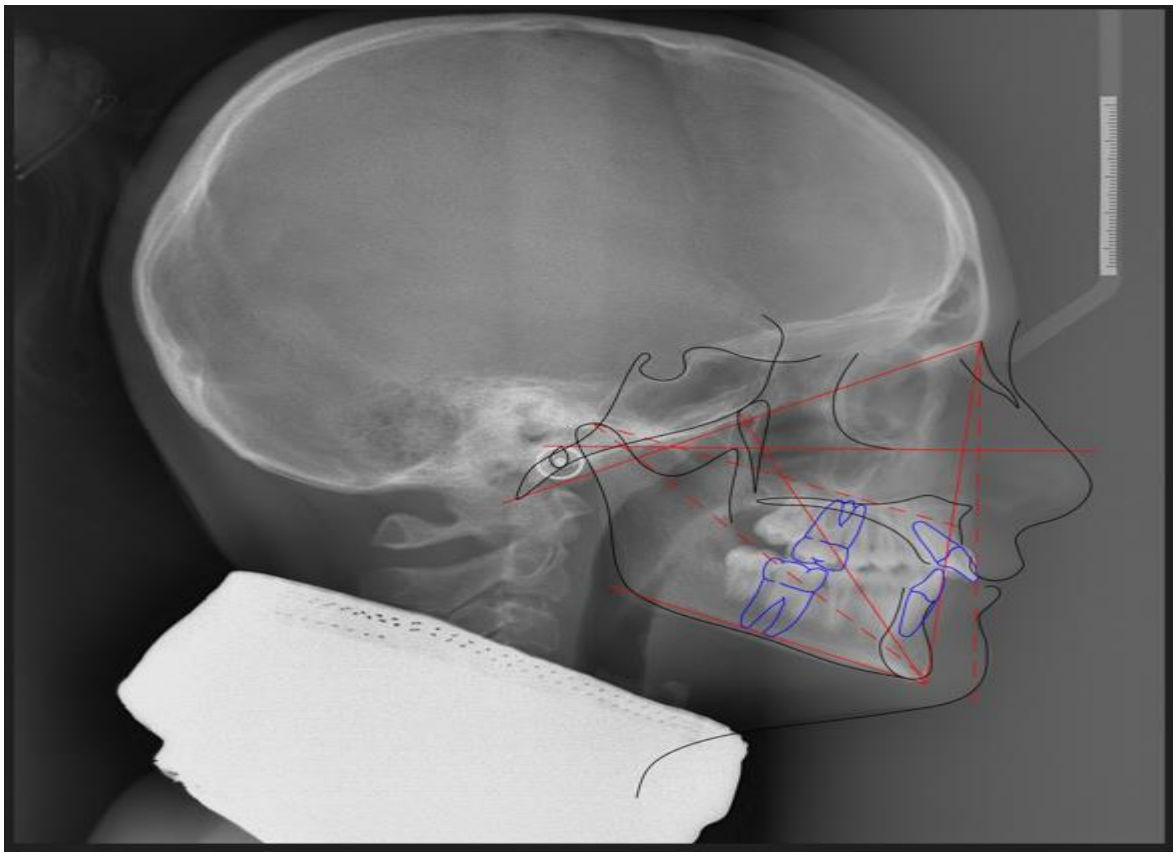

Figure 3

Treatment Progress

Bilateral Motion appliances were bonded from upper first molars to upper permanent canines, a lower lingual arch was cemented as lower anchorage and 6 ounce elastics were prescribed to be worn 24 hours a day (except for eating and brushing) from upper canines to lower first molars, for six weeks (Figure 4).

Figure 4

At the first follow up appointment after six weeks, the elastics were changed to 8 ounces and the treatment continued with 8 ounces of force for five months with the 24 hours of wear prescription.

After six months of Motion Appliance treatment, multiple changes were observed in the patient such as the establishment of a bilateral Class I platform, opening of the bite, overjet reduction, but mainly a change in the mandibular position that is evident in the patient's profile (Figure 5).

Figure 5

New records were taken at that time to develop the second phase of treatment which consisted of upper and lower fixed appliances with a non-extraction approach.

The Motion Appliances and lower lingual arch were removed. Upper and lower fixed appliances Carriere SLX 3D Self Ligating brackets were bonded using a traditional archwire sequence for non-extraction approach which included .014 Niti, .020X.020 Niti, .019X.025 TMA (Figure 6).

Figure 6

TREATMENT RESULTS

After 14 months of the Phase II treatment, all objectives were achieved including maintaining the Class I relationship, obtaining a solid interdigitation between both arches and no less important, achieving a balanced profile with a pleasant and harmonious smile (Figure 7).

Figure 7

An upper Essix** retainer was delivered and a lower fixed 3x3 was bonded.

The total treatment time for both phases was 20 months.

DISCUSSION

Early treatment of Class II malocclusions is important because it improves the patient's quality of life, among others.

Several treatment options have been described in the literature for the correction of dental and skeletal Class II malocclusion in growing patients, such as: 1) a two-stage treatment using a functional appliance in the first stage and a fixed appliance in the second; 2) a one-stage treatment using an extraoral appliance combined with a fixed appliance; and 3) the use of a mandibular fixed protraction appliance, such as Herbst and Forsus, before or at the same time as a fixed appliance [6].

In a study published in 1956, it was demonstrated that more than 85% of Class II malocclusions involve a mesio-palatal rotation component of the upper first molar, a situation that exacerbates the Class II relationship by locking the mandible in a retrusive position, which is an important component in the Class II condition [3].

The Motion Appliance is a good treatment option because within the biomechanics described, it generates a derotation movement of the first molar at the expense of its palatal root, thus releasing the mechanical block that occurs and allowing mandibular postural repositioning; which in part becomes a good percentage of the correction of class II [4].

This effect described above becomes evident in the comparison of the pre- and post-treatment cephalometric tracings; as well as in the superimposition of the same (Figure 8).

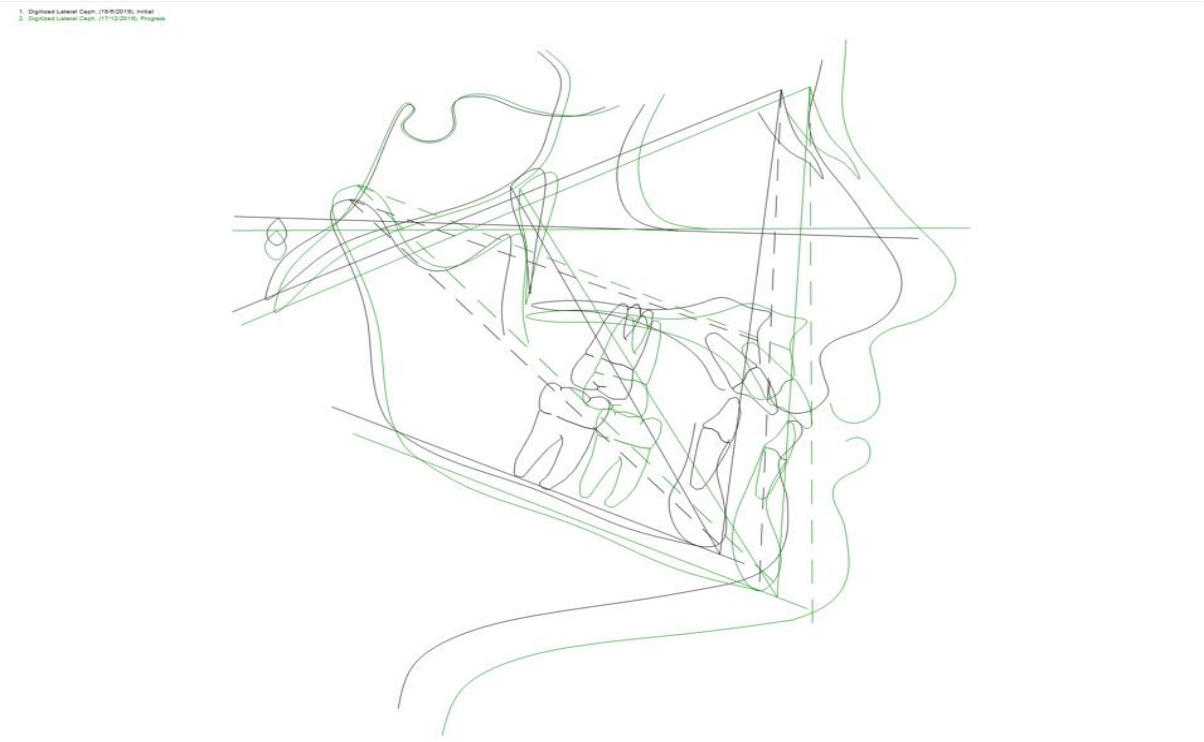

Figure 8

A similar derotation occurs in the upper 1st molars when using Rapid Palatal Expanders (RPE), wich is evidenced in some studies [2].

Changes in the molar relationship have also been reported in Class II patients treated with RPE in which 92% of the treated group spontaneously improved their Class II molar relationship by 1 mm or more, and almost 50% of the treated patients had improvements in molar relationship of 2 mm or greater, without definitive Class II mechanics incorporated into the protocol.

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