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Treatment of Class II division 1 Angle malocclusion with Extrabucal apparatus: a case report

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Abstract

Angle's class II division 1 malocclusion is a condition where the maxillary first molar occludes in a mesial position in relation to the buccal groove of the mandibular first molar, altering the sagittal relationship between the jaws. The objective of the present study is to report a clinical case of treatment of Angle's class II division 1 malocclusion in a 10-year-old female patient who was in the second transitional period of mixed dentition. The patient had mild to moderate crowding, due to lack of space to accommodate the lateral incisors and permanent canines in the maxillary arch. The proposed treatment was the use of the AEB for the distalization of the maxillary first molars, aiming at the correction of the class II molar relationship and, consequently, favoring the gain of space in the arch for the alignment of the crowded elements. According to the results presented at the end of the treatment, it was possible to observe the effectiveness of the headgear in the correction of class II molars and in the gain of arch space for the permanent incisors and canines.

Keywords: Orthodontics; Class II of Division 1 Angle; Malocclusion; Orthopedics.

Introduction

Poor positioning of dental elements is a triggering factor for malocclusions [1]. Correct occlusion in the deciduous phase can be observed from the intraoral examination at three angles: anteroposterior, vertical, and transverse. The anteroposterior aspect of normality can be considered to be the

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class I relationship of canines, where the cusp of this tooth occludes in the embrasure between the mandibular canine and the first molar, with the terminal plane of the deciduous second molars straight, presence of primate space, with Baume type I arch with slight overbite in the vertical direction and absence of posterior crossbite [2-3].

In the mixed dentition phase, primary teeth are replaced by permanent teeth. This phase is characterized by the eruption of the first permanent molars, which have great relevance for classifying the malocclusion that the patient presents, allowing the professional to assess whether or not there is a need for orthodontic and/or orthopedic intervention [4-5]. When the molars are already in occlusion, we can classify them according to the principle of malocclusions proposed by Angle, which are defined as Class I, Class II and Class III and their subdivisions 1 and 2 [6].

Class II is one of the most common cases in dental offices, and it is extremely important for the professional to carefully analyze the clinical case to reach an effective diagnosis, having a wide knowledge of the existing resources in order to ensure their efficiency [7]. The present study aims to present a clinical case of a patient with mixed dentition, Angle class II division 1, with extraoral appliance.

Case report

A 10-year and 8-month-old white female patient attended the Integrated Child Care Clinic at Fametro Faculty accompanied by her mother, complaining that her teeth were crooked and the patient did not like her smile. In the anamnesis, a good general health status was verified, no harmful habits were reported, however the patient presented as a mouth breather. In the facial analysis, it was observed that the patient has a dolichofacial biotype, convex profile, with vertical facial growth (Figure 1).

Upon clinical intraoral examination and photos of the initial documentation, it was noted that the patient was at the end of the intertransitory period of mixed dentition, normal overbite and overjet, terminal plane of the deciduous second molars with distal step and absence of caries.

A pulp polyp was observed in element 65, which was extracted, primary dental crowding due to lack of space for the lateral incisors and permanent canines, with Angle class II division 1 malocclusion, characterized by the mesiobuccal cusp of the occluding maxillary first molar mesial to the central sulcus of the mandibular molar (Figure 2).

Figure 1: Initial photographs of the face in front and profile position (Source: CIMO).

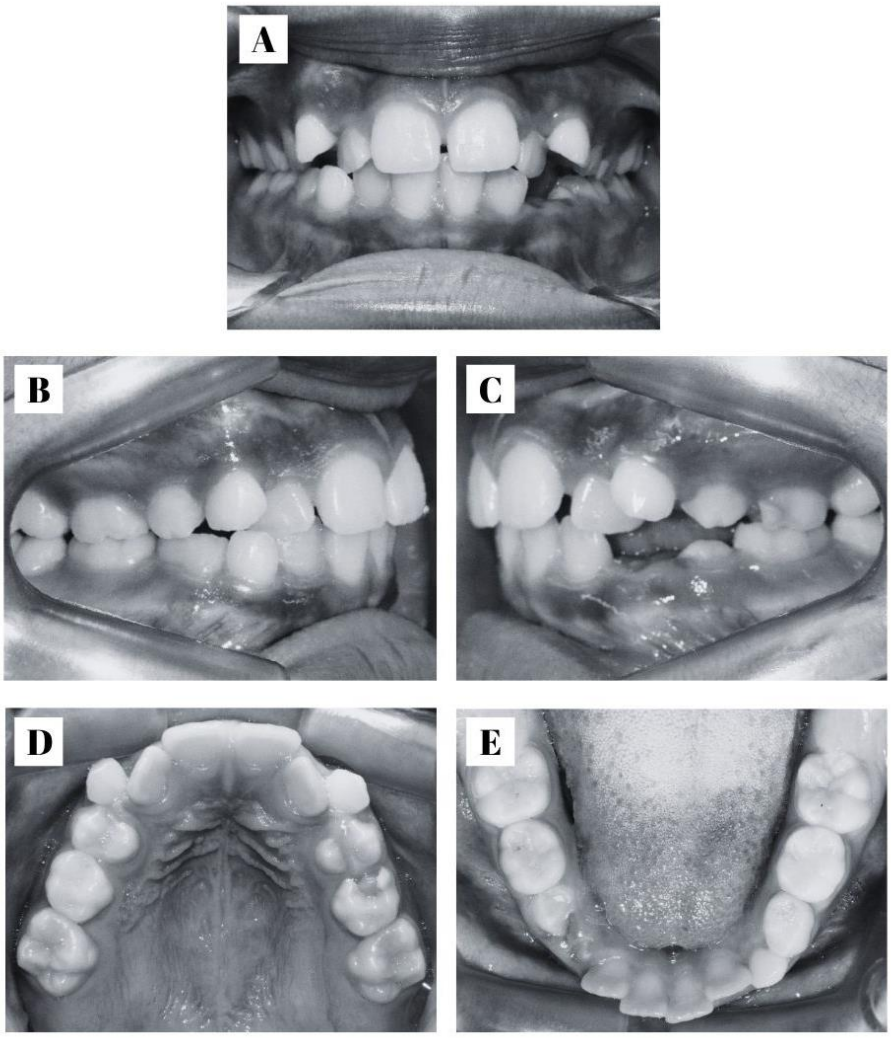

Figure 2: Initial intraoral photographs: frontal (A), right lateral (B), left lateral (C), superior occlusal (D) and inferior (E), (Source: CIMO).

Regarding the imaging exams, the panoramic radiograph showed a normal sequence of teeth eruption with no abnormalities. The proposed treatment for class II, division 1 was the use of low-traction headgear (extra buccal device) for the distalization of the maxillary first molars, aiming at correcting the class II molar relationship and consequently favoring the gain of space in the arch for alignment of elements 12, 22, 13 and 23.

For the preparation of the appliance, it was necessary to select orthodontic bands with triple tubes, in elements 16 and 26 cemented with glass ionomer (maxxion C), where the tube position was positioned in the middle of the mesiobuccal cusp of the molars.

After installation, ½ heavy elastic was used with a force of 225 grams bilateral, finishing the installation of the extra buccal device. The device was used for 6 months by the patient, after which the correction of the class II molar relationship was observed (Figures 3 and 4).

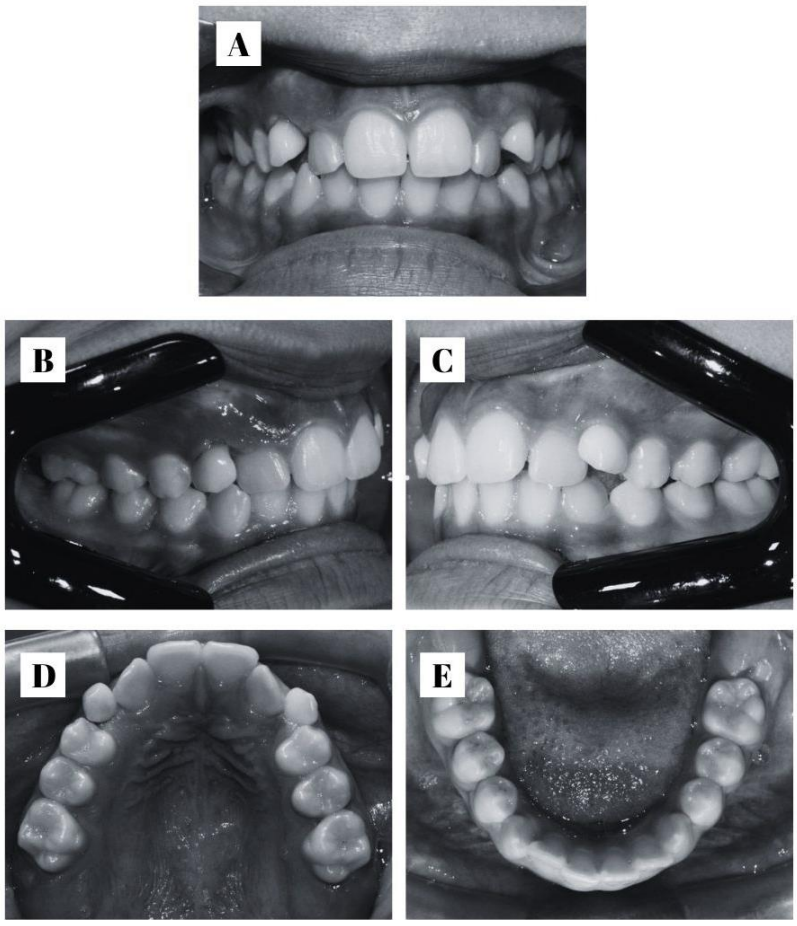

Figure 3: Final intraoral photographs after 6 months of headgear use: frontal (A), right lateral (B), left lateral (C), superior occlusal (D) and inferior (E).

Discussion and Conclusion

The planning of orthodontic treatment changes according to the malocclusion that the patient presents. This condition results from an imbalance between muscle, dental and skeletal structures, which should be based on clinical and cephalometric findings [8]. Class II division 1 is a condition where the maxillary incisors are inclined towards the buccal and the maxillary molar in a mesial position in relation to the mandibular first molar. Patients sometimes exhibit atresic upper arch, increased overjet, deep palate and parted and dry lips, which ends up causing disharmony of the facial muscles [9].

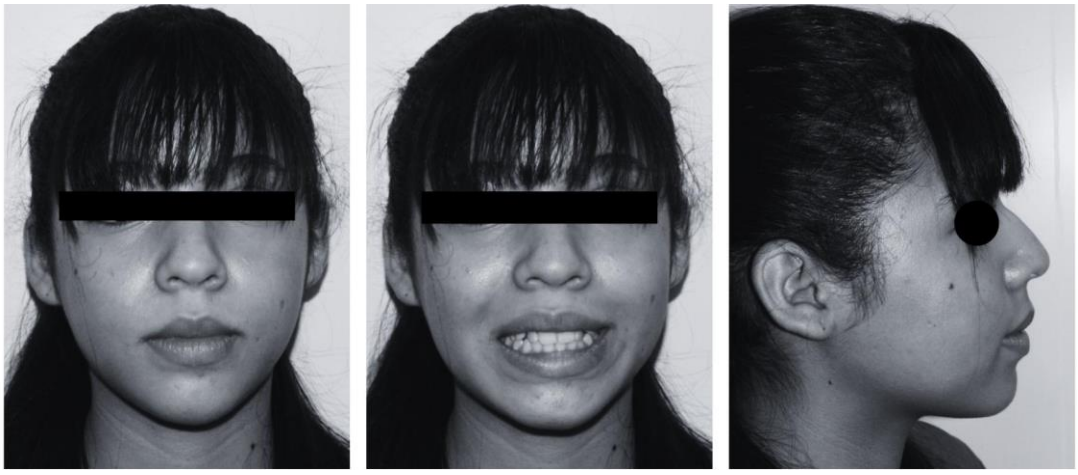

Figure 8: Face photographs in frontal and profile position (Source: CIMO).

In the present case, the patient was in the second transitional period of mixed dentition, presented primary dental crowding as a result of the lack of space for the accommodation of the lateral incisors and permanent canines in the dental arch and buccal protruded lower incisors due to malocclusion class II division 1.

For patients who have malo-cclusions and are in the growth phase, the use of orthodontic and/or orthopedic mechanisms is recommended as a viable alternative for an early approach, but it is necessary that the Dental Surgeon has biomechanical knowledge so that there is a correct indication and monitoring during treatment with the aim of achieving success [10]. In addition, studies show that adolescents are concerned about the appearance and poor positioning of teeth, which leads to the shame of smiling and often interacting with other people,

compromising their social relationships [11-12].

In the present case, for the installation of the extra buccal device, elements 16 and 26 were banded with triple tubes using glass ionomer cement, the position of the tube was in the middle of the mesiobuccal cusp of the molars and the external arm of the extra buccal device passing through the center of resistance of the molars. There are two factors that must be considered, the center of resistance of the maxilla (CResM) and the center of resistance of the dentition (CResD), in the maxillary first molars the centers of resistance (CRes) are found near the trifurcation of the roots [13].

According to Teuscher (1986) patients who are in the growth phase and have Class II malocclusion, the best time to exert force is where the line of action passes between the CResD and the CResM. The pulling force action line is that line connecting the point of origin of the force to the hooks of the outer bow. The relationship between this line and the center of resistance of the molar determines the results of the force that will act on the tooth If the line of action passes occlusally to the center of resistance, the tooth crown will tilt distally [14].

Dental malposition has greater impacts on the quality of life of patients in early adolescence. The extraoral appliance was the interceptive treatment capable of correcting the patient's class II malocclusion and decreasing the anterior crowding, thus obtaining an improvement in the facial profile.

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