

## Correction of Anterior Open Bite Malocclusion with the Association of Removable Palatal Crib and Chincup

### Correção da Mordida Aberta Anterior com Associação da Grade Palatina Removível e Mentoneira

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#### Abstract

Anterior open bite affects the child population by approximately 20%, with great aesthetic-functional impairment due to dental-skeletal changes, which may involve the presence of posterior crossbite. The objective was to present the anterior open bite correction associated with posterior crossbite with the use of a removable palatal crib. Patient during the mixed dentition phase presented an anterior open bite caused by a pacifier sucking habit and secondary lingual interposition. The treatment protocol consisted of the use of removable expander with palatal crib and nocturnal use of the chincup. The anterior open bite was corrected, and the best transverse relation of the arches was obtained. The precocious treatment using the palatal crib associated to the chincup allows to achieve favorable results in the resolution of the anterior open bite.

**Keywords:** Open Bite. Malocclusion. Orthodontics, Interceptive.

#### Resumo

*A mordida aberta anterior acomete a população infantil em aproximadamente 20%, com grande comprometimento estético-funcional em decorrência das alterações dentoalveolares, podendo envolver a presença de mordida cruzada posterior. O objetivo do estudo foi apresentar a correção da mordida aberta anterior associada à mordida cruzada posterior com a utilização de grade palatina removível. Paciente em fase de dentadura mista, apresentava mordida aberta anterior ocasionada por um hábito de sucção de chupeta e interposição lingual secundária. O protocolo de tratamento consistiu na utilização de expansor removível com grade palatina e uso noturno da mentoneira. A mordida aberta anterior foi corrigida e melhor relação transversal dos arcos foi obtida. O tratamento precoce utilizando grade palatina associada à mentoneira permite alcançar resultados favoráveis na resolução da mordida aberta anterior.*

**Palavras-chave:** Mordida Aberta. Má Oclusão. Ortodontia Interceptora.

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#### 1 Introduction

The Anterior Open Bite (AOB), observed in approximately 17% of children during the stage of mixed dentition<sup>1,2</sup> is characterized by the presence of a negative vertical trespass of the incisal edges of anterior superior and inferior teeth<sup>3,4</sup>. It has great aesthetic-functional impairment, as a result of dental and skeletal changes that may be involved. In addition, it hinders feeding due to reduced power cut and apprehension and causes problems in speech impaired by the absence of seal in the anterior region. These occurrences may cause problems for children, causing some type of psychological problem, being evident the necessity of early treatment<sup>5</sup>.

The prognosis can vary from good to poor, according to the severity and the etiological factors associated to its emergence, which can act in isolation or multifactorial manner<sup>6</sup>, among which the following may be cited: Heredity and environmental causes, such as hypertrophy of the tonsils, oral breathing and, mainly, the deleterious oral habits<sup>7-9</sup>. Among the habits, those who possess greater influence are the digital sucking and pacifiers, function, positioning and typical

lingual pressing and labial interposition between the incisors. In addition, the patients who present vertical pattern of growth have higher tendency of development of this malocclusion<sup>6</sup>.

For a correct diagnosis, it is necessary to differentiate among the types of malocclusion: dental, skeletal, and dentoalveolar<sup>4</sup>. When the skeletal component is involved, the genetic influence is predominant, with the presence of a trend of vertical growth, which may be accompanied by an increase of the gonial angle and the mandibular plane, counterclockwise rotation of the palatal plane, clockwise rotation of the mandible, with consequent increase in the antero-inferior facial height increased and mandibular retrognathism<sup>3,4,6</sup>. On the other hand, the dental abnormalities are caused by modification of the normal vertical development of anterior teeth, routinely associated with the presence of deleterious oral habits, without, however, interfering in the development and format of the alveolar process<sup>4</sup>. From the moment in which the interferences perpetuate in the normal vertical development of the teeth and there are changes in alveolar process, there is an AOB of dentoalveolar character<sup>4</sup>.

Several conducts have been implemented in the interception of open bite and thus allow the normal development of the occlusion. The treatment varies according to the etiological factor, age, pattern of growth and cooperation of the patient, and can be used for fixed or removable palatal grids, and orthopedic appliances and fixed or bonded spur<sup>7-12</sup>.

This article aims to present a protocol for early treatment of skeletal anterior open bite associated to posterior crossbite with the use of removable and fixed expander with palatal grid and nocturnal use of chincup.

## 2 Case Report

Patient 8 years and 9 months of age, male sex, in the stage of mixed dentition, intertransitory period, sought treatment due to anterior open bite, which interfered in his speech, caused by the habit of sucking a pacifier. During the examination, it was observed secondary tongue interposition, accompanied by narrowing of the dental arch and unitary crossbite of upper right canine.

The clinical examination showed no symmetry and mesofacial pattern with labial seal. At the intraoral examination it was observed molar Class I ratio of Angle with anterior open bite and tongue interposition during swallowing to promote the anterior sealing (Figure 1).

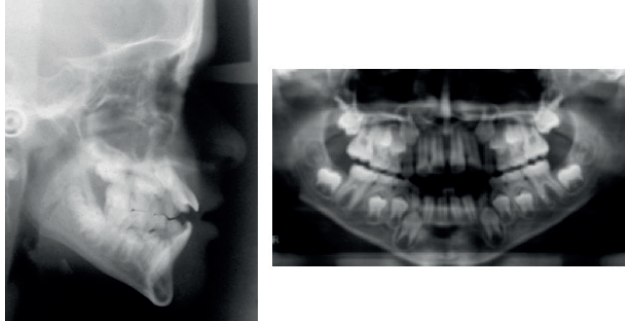
**Figure 1 - Initial intrabuccal Photos**



Source: The authors.

At the radiographic examination it was observed a trend of vertical growth and normality in the stage of root formation of permanent teeth as well as in the sequence and chronology of eruption (Figure 2).

**Figure 2 - Initial radiographic Photos**



Source: The authors.

For interception of anterior open bite, the treatment protocol established consisted of the installation of a

removable device type Hawley plate with palatal grid and expansive screw (Figure 3) associated with the use of the chincup.

**Figure 3 - Appliance used for the treatment of anterior open bite**



Source: The authors.

The incorporation of the lingual grid aimed to contain the tongue interposition caused by the already existing open bite. After installation of the appliance, the first activation was performed with a full turn to adjust the appliance in the oral cavity, then parents were advised the activation of ¼ turn each week during one month for transverse adequacy of the upper arch, with removal of bite needed to unwind the upper right canine. Due to the laxity of the perioral muscles and abnormal posture of the tongue and in an attempt to control the mandibular growth, it was chosen for the association of the chincup use at night. The treatment was carried out for 10 months, obtaining a normal transverse ratio and resolution of the anterior open bite (Figure 4).

**Figure 4 - Intermediary intrabuccal Photos**



Source: The authors.

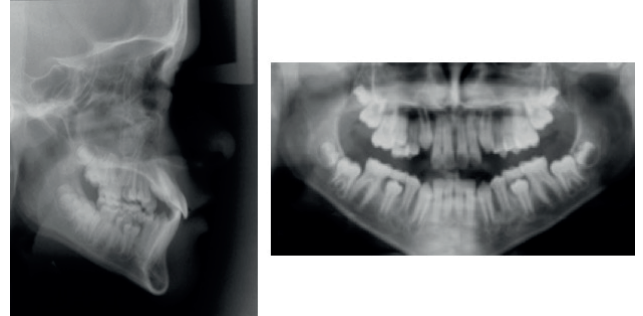
After 1 year and 6 months after the removal of the appliance it is evidenced the stability of the treatment (Figures 5 and 6).

**Figure 5 - Intermediary intrabuccal Photos**



Source: The authors.

**Figure 6 - Final radiographic Photos**



Source: The authors.

## 3 Conclusion

Early diagnosis and treatment of anterior open bite, in mixed dentition phase, when it presents a dentoalveolar character, has a very favorable prognosis. The elimination of the etiological factors associated with early orthodontic

treatment favored the correction of malocclusion and obtainment of an adequate occlusal ratio, promoting occlusal, functional and aesthetic improvement.

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