Anterior Open Bite Using Simões Network in Growing Patient: A Case Report

Valquíria Fortunato Ribeiro, Critina Lúcia Feijó Ortolani, Taís Pereira Leal, Hatsuo Kubo and Carolina Bruder*

Department of Odontology, University of Paulista, Brazil

*Corresponding author: Carolina Bruder, Department of Odontology, University of Paulista, Brazil

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Abstract

The anterior open bite is characterized by the negative vertical overhang occurring in the anterior region. It consists of a discrepancy in the vertical direction and is one of the malocclusions with greater aesthetic-functional impairment, besides dental and skeletal alterations. It has a high prevalence in the deciduous and mixed dentition and its etiology is multifactorial, highlighting the deleterious oral habits as the most prevalent. The objective of this study was to present the clinical case of a growing female patient presenting an anterior open bite associated with thumb sucking, by means of treatment with the functional orthopedic device Simões Network (SN3). During the first 12 months follow-up, we observed facial and intraoral oral changes and forward, the improvement of functional and craniofacial relationships, observed through complementary tests.

Keywords: Open Bite; dentition, mixed; orthopedics

Introduction

The balance of soft tissue growth and facial changes are important for the craniofacial development. Mineralized bone is formed through a process known as ossification by the membrane activity providing the function of remodeling and displacement. Breath, chewing, phonation and swallowing functions are prior to the regular growth development [1]. Thumb or pacifier sucking, and tongue thrusting may cause a disorder knowing as an anterior open bite. The severity of the malocclusion will be according to the magnitude, frequency and time of the habit [2]. Prolonged breastfeeding will be recommended to avoid nonnutritive sucking habits, as the sucking of fingers, pacifiers and bottle feeding [3,4]. Anterior open bite (AOB) is defined as the lack of incisal contact between anterior teeth in centric relation. AOB creates aesthetics problems, speech disorders and tongue thrusting habit [5]. This malocclusion requires early treatment due to all the etiological factors mentioned before. The stability will be achieved in a long term; thus, the pediatric dentist must be alert and minimize the problem as soon as possible in attempt to decrease the time of the treatment and to maintain the stability 5. The auto correction index is low when the correct habits are achieved [6,7]. The prevalence in the population ranges from 1,5% to 11%. Some authors also describe that 17% to 36% of those seeking orthodontic treatments feature AOB [8-11]. This malocclusion may also occurs due to a skeletal component classified open bite into dental and skeletal, associated with excessive molar height, divergent upper and lower

occlusal planes, steep mandibular plane angle, increased gonial angle, short mandibular ramus, downward rotation of posterior part of the maxilla or palatal plane tipped up anteriorly, increased lower anterior facial height and decreased upper anterior facial height. According to severity, modalities of treatment are required: growth modulation; orthodontic mechanotherapy and the combination with orthognathic surgery [12-14]. Orthopedics devices is a therapy to readapt the muscular system which is very efficient in growing patients resuming the facial balance [15]. This article presents a clinical case of growing female patient, with anterior open bite treated with the functional orthopedic device Simões Network (SN3) [16].

Case Report

A female patient, 8 years and 4 months of age, melanoderma, came for treatment at the Postgraduate Course in Orthodontics of Brazil University (São Paulo, SP, Brazil). A facial analysis detected convex facial profile, lack of lip closure, and a decrease in nasolabial angle (Figure 1). The patient exhibited thumb sucking habit, mixed breathing, atypical swallowing and speech. shows angle class II malocclusion, 6 millimeters of an anterior open bite, mild crowding and a supernumerary Figures 2&3 tooth in the anterior lower jaw with mandibular midline deviation to the right. Cephalometric Rx shows proclined upper incisors due to the thumb sucking the objectives

Figure 1: Convex facial profile, a decrease in nasolabial angle and the upper lip covering the incisor.

Figure 2: Anterior open bite, mild crowding and a supernumerary tooth in the anterior lower jaw and proclined upper incisors.

Figure 3: Angle class II malocclusion, supernumerary tooth in the anterior lower jaw and an 6mm open bite.

for the first phase of the treatment were to eliminate the thumb sucking, the open bite, dental deviations, provide arch expansion and the extraction of the supernumerary tooth.

Treatment Progress

A removable appliance known by Simões Network (SN3) composed with a stainless steel bimaxillary grid ("lower winglets model") that simulates the incisors occlusion and provides the correct tongue position [15] (Figure 4). The screw was expanded

with one-quarter turn biweekly. After 3 months of the treatment beginning o, we added a lip bumper to improve lip seal (Figure 5). We recommended the use for 10 or 12 hours a day. The supernumerary extraction was performed 7 months of the treatment beginning. Figure 6 shows the final of the first stage. Figure 7 shows Angle class I malocclusion and Figure 8 shows the Cephalometric and panoramic Rx after 23 months with the orthopedic appliance. Cephalometric superimposition (Figure 9) and analysis (Table 1) indicated dentoalveolar open bite pretreatment and the correction posttreatment.

Figure 4: SN3 appliance, bimaxillary anchorage with "lower winglets model".

Figure 5: A lip bumper was added to improve lip seal.

Figure 6: The correction of open bite and the improvement of the alignment.

Figure 7: The arch expansion and molar Class I.

Figure 8: Cephalometric and panoramic Rx after 23 months of treatment.

Figure 9: Cephalometric superimposition revealed maxillary incisor retrusion and mandibular incisor in normal bite.

Table 1: Summary of cephalometric measures.

Mesure	Norm	Pre	Post
FMA	25°	24.6°	22°
SN.Gn	67°	65°	68°
ANB	2°	2.42°	1,79°
SNA	82°	83°	80°
SNB	80°	81°	78°
1/.NA	22°	33,4°	28°
1/-NA	4mm	5mm	5mm
1.NB	25°	29.3°	28°
1/-NB	4mm	4mm	5mm

Discussion and Conclusion

According to the authors, AOB is a challenge daily faced because and it can result speech and swallows' problems, tongue posture and imbalance between jaw postures [17-19]. Bonna 2016 alerts that the orthodontics or orthopedic devices are fundamental but without family support the habit suppression will not be achieved [20]. The objective for the first phase of treatment were to eliminate thumb sucking, open bite and arch expansion with orthopedic appliance Simões Network SN3 and after a lip bumper was included to improve seal lip. These goals were achieved during the first stage. Graphic 1 shows best fit reduction open bite from May to November 2017. Even pubertal increments offer best time for orthopedic treatment helping determine the predictability, growth direction, patient management and total treatment time, we did not wait to treat because the disadvantages of the open bite [21]. This reported case was successfully treated with SN3 remained stable after the AOB correction. For the second phase with fixed orthodontic treatment will be necessary [22-29].

Graphic 1: Closure open bite variation during time.

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