

Monitoring of the Inverted Relation of Gingival Pads in a Non-Syndromic Infant

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Abstract

BACKGROUND: Monitoring the occlusal relationship of the infant's gum pads is not a common practice in pediatric dentistry. In general, pediatric dentists are used to observe the conformation of the arches and clinical findings that may be outside of the infant's normal oral anatomy. Here we tested the hypothesis that intervention before eruption of the primary dentition will minimize anterior crossbite in the primary dentition. To address our hypothesis, we used one case to demonstrate the importance of monitoring the relationship of the gum pads and primary teeth eruption to avoid possible deviations in the pattern of orofacial development and prevent future malocclusions.

MATERIALS AND METHODS: After proper consenting and anamnesis, an inverted relationship of the gum pads was observed in a 7-month-old baby while sleeping and at occlusal rest. Given that the patient was exclusively breastfeeding, adjustments of the catch were made, such as a greater opening towards the areola and nipple, and adjustments in the position and posture of the baby.

RESULTS: During the eruption phase of the anterior teeth, an anterior crossbite was observed. Caregivers were prescribed exercises that were to be performed in the maxillary and mandibular arches to stimulate maxillary growth and guide the posture of the mandible. The exercises were intensified during the eruption phase of the lateral incisors and molars and the occlusion was stabilized with bilateral masticatory guidance and different textures to be offered during food transition.

CONCLUSION: Based on the results

observed for this case, the interventions allowed for a more satisfactory occlusion.

KEYWORDS: Gingival rounding; Prognathism; Child; Infant; Angle Class

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Introduction

Angle Class III malocclusion in the permanent dentition has a multifactorial etiology [1]. Among the various genetic and epigenetic factors, we can highlight inadequate postural habits of the mandible and inadequate posture of the tongue [2,3]. We can also include a history of

prolonged sucking habits, alterations in the establishment of mastication, atypical swallowing, obstruction of the nasal airways, mouth breathing, size of the tongue or tonsils and the presence of adenoids, among other factors. Most of these factors can be observed by the pediatric dentist, therefore, a timely intervention may

prevent prognathism in the permanent dentition [2,3].

Transdisciplinary care in the first years of facial development will aid in the accurate diagnosis and timely interventions for cases of mouth breathing, airway obstruction, swallowing problems, and lip and tongue positioning, providing for the

opportunity to help establishing a healthy and functional primary occlusion. These early interventions can minimize and prevent future vertical, transverse, and anteroposterior problems in the deciduous and/or permanent dentitions [4].

A device used in infants born with Down syndrome aiming to sensory motor stimulation [5], in addition to sensorimotor manipulation techniques for the tongue, lips and mandible posture, have shown effective results in tongue posture and lip sealing in these patients. Other devices to reposition the mandible have also been suggested [6-9]. Some of these devices involve the use of a wooden or plastic spatula (tongue depressor) behind the upper anterior teeth and in front of the lower anterior teeth as an inclined plane to position the mandible distally and depress the tongue, along with postural exercises for the mandible in cases of postural mandibular protrusion. These techniques are suggested for syndromic or non-syndromic patients [6-10]. Preventive interventions in infants require attention to distinct parameters that are considered in the primary and mixed dentitions.

Given the relevance of this theme, we tested the hypothesis that intervention before eruption of the primary dentition will minimize anterior crossbite in the primary dentition. To address our hypothesis, we used one case to demonstrate the

importance of monitoring the relationship of the gum pads and primary teeth eruption to avoid possible deviations in the pattern of orofacial development and prevent future malocclusions. For that purpose, one case that received preventive interventions performed in a 7-month-old, with a pattern of mandibular protrusion and on exclusive breastfeeding. Muscle relaxation techniques and digital compression exercises were used.

Study Case

The mother of a 7-month-old female, residing in the city of São Paulo, State of São Paulo, Brazil, sought dental care on October 19, 2020, for her first visit to the pediatric dentist. In this first evaluation, extra and intraoral exams were performed [11,12]. Regarding the relationship of the gum pads [13-15], an inverted relationship between them was observed [16] (Figure 1). This relationship was determined with the infant at occlusal rest while sleeping [17,18].



Figure 1. The infant had gingival rounds in inverted relation. Photograph was taken with the patient asleep.

In the anamnesis, the mother reported normal delivery, exclusive breastfeeding, and no other cases of

prognathism in the family. There was no relevant medical history. The child's diet was still exclusively breast milk. Nasal breathing, absence of habits, and no ankyloglosia or short lip frenulum were found. The observation of the feeding [11] was carried out and, in this phase, the only intervention was the adjustment of the catch and the position of the baby (Figure 2).



Figure 2. Mother was instructed to allow for a greater mouth opening and catch on of the areola.

The infant was monitored monthly to observe feeding and latching, as well as the evolution of mandibular posture with reference to the relationship between occlusal arches.

In the eruption phase of the lower incisors, which happened around 9 months of age, mandibular protrusion was still observed. The evaluations

were performed with the child asleep (Figure 3).



Figure 3. Evaluation of the relationship of the gingival edges during the eruption of the lower primary central incisors.

At follow-up visits, it was observed while the child asleep the eruption of the upper incisors, and the establishment of an inverse relationship (Figure 4). At this time, transition feeding had already started.



Figure 4. Observation of the relationship between the arches and the sleeping baby, in occlusion.

At this stage, preventive interventions were suggested to stimulate the growth of the premaxilla and to improve mandibular posture. An intervention

of functional digital compression exercises was implemented [10].

All procedures were demonstrated to the mother in the first consultation and the exercises were repeated three times in the presence of the author until they were properly performed.

All exercises were performed at home 2 or 3 times a day for 3 to 5 minutes according to the child's cooperation. The exercises were monitored once a week by the professional [10] (Figures 5 and 6).



Figure 5. Intervention where the index finger is placed under the palatine papilla with slight pressure (up to a small ischemia) [10].



Figure 6. Mandibular posture was guided with the index finger in the cervical region of the lower incisors or chin region, guiding the mandible in a more backward position.

The occlusal relationship was constantly monitored and adapted

according to the child's collaboration. There was a change in the mandibular posture and the anteroposterior relationship was re-established after performing the exercises (Figure 7).



Figure 7. Anterior overlap and reestablishment of the anteroposterior relationship after performing the exercises.

The occlusion was stabilized with the eruption of the first deciduous molars, and subsequent better masticatory function (Figure 8).



Figure 8. Stabilized occlusion after eruption of primary first molars.

Discussion

The extra and intra-oral observation of an infant regarding the relationship of the gum pads is important from the point of view of monitoring the orofacial development and eruption of the deciduous teeth.

It is important that the pediatric dentist is attentive to the child's

harmonious development of the arches and functional occlusion. The correction of facial disharmonies of dental, functional, or skeletal origin in early childhood is still not a common practice, as it involves several limitations. One of them is the adherence of the parents to the attention and carrying out of the preventive conducts at home with the due collaboration and conditioning of the child.

For these practices to be viable, it is important that the professionals involved are qualified and specialized. When parents observe these changes and seek professional help, their adherence to carry out the proposed treatment at home is facilitated [10].

Muscle relaxation massages and postural guidance and digital compression exercises performed in defined areas and at the right time can provide quick and effective results for establishing a harmonic relationship between the arches.

Although these exercises have already been proposed for patients with disabilities [5], their practice in non-syndromic patients is still not common [5,6,19,20]. There is little evidence regarding the effectiveness of these techniques. More studies are needed, especially in the first months of the infant's life. We know that functional or skeletal problems that are not treated in early childhood can be perpetuated in the mixed and permanent dentitions⁴. Waiting to intervene can lead to more invasive,

complex, long, and expensive orthodontic treatments that can negatively affect the patient's quality of life [21]. In addition, the concepts of aesthetics and self-esteem also influence the quality of life of young patients, hence the need for preventive intervention as soon as any change is identified [21].

Proper guidance from dental prenatal care can positively influence mothers towards effective practices in health and caries prevention [22]. The observation of facial images on morphological ultrasound can influence positive health behaviours, thus, they can also be important tools for promoting oral health during pregnancy [22-24]. Parents must be willing to cooperate, and this is the key to successful results.

Acting as early as possible, even during the eruption phase of the deciduous teeth, can be effective as this is still a time when functional, postural, dental, or skeletal problems have not been established.

Performing digital compression exercises can be even more effective if started from the first years of the infant's life, before the eruption of the first deciduous molars, preventing vicious postures of the mandible or tongue [3,4]. Most therapies proposed in the literature are designed for later, when patients with complete deciduous dentition [25,26]. Future clinical studies should be encouraged aiming at early interventions to prevent malocclusions. Additional

investigations are needed with larger samples, well-defined diagnostic criteria, rigorous scientific methodologies, and long-term control [27].

Conclusion

This paper reports an early intervention where constant monitoring of orofacial development and proper guidance to parents were carried. The goal was establishing a harmonious incisor guidance and a favourable anteroposterior relationship of the arches during the eruption phase of the first deciduous teeth. The hope is that these early interventions will decrease severity of malocclusions.

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