

Harmful oral habits removal and reestablishment of occlusion

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ABSTRACT

Objective: this paper aimed to report a series of cases of children with deleterious oral habits (finger sucking, pacifier and bottle) and discuss how explanations and illustrative leaflets, about the importance of removing the deleterious habit, may be applied in a practical way. **Material and Methods:** the children's caregivers were guided by explanations and illustrative leaflets, about the importance of removing the deleterious habit, emphasizing the consequences brought by the permanence of the habit and the importance of helping their children. **Results:** removing the deleterious oral habit in earlier age provides the self-correction and regression of malocclusions. **Conclusion:** therefore, we found that children who had the sucking habits and anterior open bite, after guidance on removing the habit in earlier age presented self-correction and regression of this malocclusion. Thus, we can confirm the importance of encouraging the practice of removing the deleterious oral habit in the appropriate age group.

Keywords: Bottle feeding; Child; Finger sucking; Habits; Malocclusion; Open Bite; Pacifiers.

Introduction

In many countries there was a large drop of carious lesions in children, with this other topics of dental range as malocclusions, gained focus and began to be discussed and included as major public health problems.¹

In pre-school children, between 2-6 years old in primary dentition, malocclusions that stand out as the most frequent are the increased overeat, anterior open bite and posterior crossbite.²⁻⁵ Among these malocclusions, the anterior open bite presents relevant frequency with index around 18.75% to 21.0%.^{2,5-9}

The malocclusions are often originated from harmful oral and facial muscle habits, and may be attributed to functions such as: nutritional habits suction (bottle), non-nutritive sucking (pacifier and finger) and other harmful habits (biting objects, onychophagy), nasopharynx diseases, lung function disorders, improper posture of the tongue.^{10,11}

Studies find associations between malocclusions and the presence of harmful oral habits (finger sucking, pacifiers and baby bottles) and low frequency of breastfeeding.^{7,12,13} Removal of sucking habits in children in primary dentition stage may provide the correction or malocclusion attenuation of the anterior open bite type, the adequacy of structures and the redirection of the stomatognathic system functions.⁴ According to Vig and Fields¹⁴ between 2-4 years old, it is suggested an intensification of counseling for habit removal, for there is a great possibility of morphological self-correction of malocclusion and restoration of the balance of the stomatognathic system.

Based on the above, this study aimed to report cases on how explanations and illustrative leaflets are important in the removal of the deleterious habits (finger sucking, pacifier and bottle) when applied at an early age for self correction and regression of malocclusions.

Case Reports

Ethical Aspects and Patient Selection

This work was submitted and approved under number CAAE 02542412.0.0000.5243 Local Ethics Committee. The cases included in this study were authorized by the children's parents or legal guardians.

The design of this study is a series of cases. A descriptive treatment evaluation of similar cases is a form of observational study, very common in clinical research, accompanying patients with one or more exposures known to a given similar treatment and analyzing exposure and outcome. The cases can be retrospective or prospective and usually involve a smaller number of patients compared to other study designs with more scientific evidence.

The cases presented in this article are of children between 2 and 4 years old from a public school in the city of Nova Friburgo, Rio de Janeiro, Brazil, which had harmful oral habits and anterior open bite. Initially, 40 children were invited to be enrolled in a Dental Care Extension Program at the Fluminense Federal University, Nova Friburgo, state of Rio de Janeiro, Brazil. The participants were inserted in a rigorous program of follow-up of preventive-educational counseling, which offers follow up reviewing appointments. All of them were evaluated, 15 declined to take part in the study because of the distance from their homes. As a dropout - 10 did not attend the evaluation appointments and 5 changed the phone contact. As a result, the final sample consisted of 10 volunteer participants. Those participants returned to the follow up appointment. The patients characteristics are described in Table 1.

Table 1. Patients characteristics

Patient	Sex	Ethnicity	Initial exam age	Medical history
No.1	F	C	3	No
No.2	M	C	3	No
No.3	M	A	3	No
No.4	F	C	4	No
No.5	M	C	2	No
No.6	F	C	2	No
No.7	M	C	2	No
No.8	F	A	2	Yes
No.9	M	A	4	No
No.10	F	C	3	No

Legend: Sex: f- female, m-male; Ethnicity: c-caucasian, a-afrodescendants

Evaluation of Harmful Oral Habits and Malocclusion

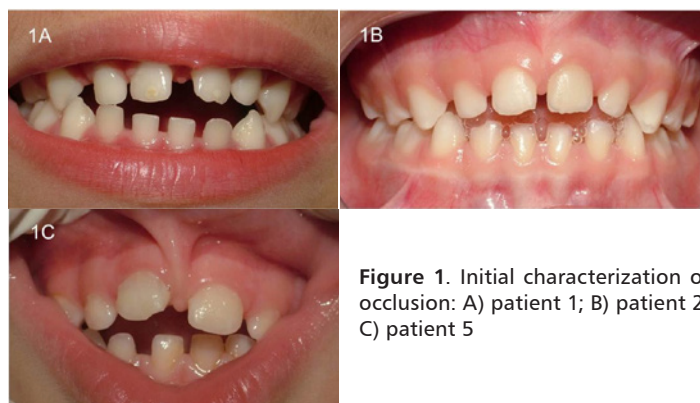
A face-to-face interview to assess sample characterization (sex, age, ethnicity) and oral habits (nutritive sucking habits - bottle feeding; non-nutritive sucking habits - finger sucking and pacifiers) was done by students previously trained. The training exercise was performed using Power Point tutorial and the calibration was carried out in a total of 24 hours of exercises. Interviews agreement was satisfactory (Kappa 0.80). These data were inserted in a Dental Care Extension Program medical record.

The occlusion classification was done by two examiners previously trained and calibrated (kappa = 0.80) by professional orthodontic area. We use the Burdi and Moyers¹⁰ definition (localized absence of anterior occlusion, while the remaining teeth are occluding) to classification of the anterior open bite malocclusion.

The habits characteristics and period of malocclusion regression after the counseling are described in Table 2. The malocclusions (anterior open bite) are presented in Figures 1A, 1B and 1C.

Table 2. Patients habits characteristics and period of malocclusion regression after the counseling

Patient	Habit of nutritive sucking habits	Non-nutritive habits		Period of malocclusion regression
	Artificial Breastfeeding	Pacifier	Finger	
No.1	x	x		6 months
No.2	x	x	x	6 months
No.3	x	x	x	6 months
No.4	x	x		4 months
No.5	x	x		4 months
No.6	x	x		4 months
No.7	x	x		6 months

**Figure 1.** Initial characterization of occlusion: A) patient 1; B) patient 2; C) patient 5

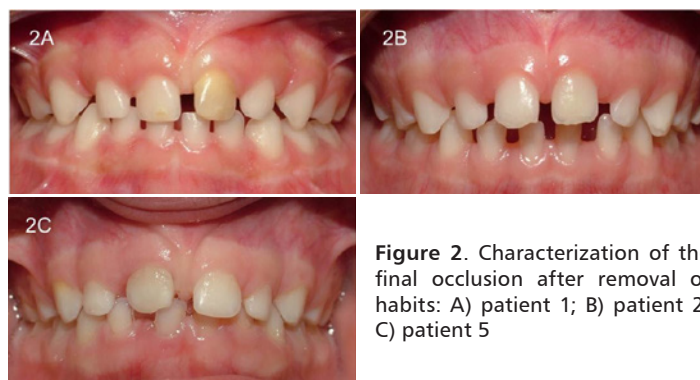
Guidance on the Removal of the Habit

After identification of children who presented oral habits and anterior open bite in schools, they and their parents were invited to attend the Public School of Dentistry, and received guidance for removal of harmful habits which were potentially etiologic factors of malocclusion. Guidance methodology was through explanations and illustrative brochures, the guidelines and verbal explanations were reinforced by the delivery of illustrative brochures highlighting. Verbally, the parents were advised to remove harmful habit before the age of four. We emphasized the consequences brought by the permanence of the habit and the importance of helping their children. Regarding the habit of artificial feeding, they were advised to replace the bottle by transition glasses appropriate to age, which are supported on the lips, tongue or teeth to provide a mandibular stability, and thus absorb the liquid necessary for food / hydration.

Re-evaluation with Clinical Examination of Children to Observe the Regression of Malocclusion

After initial guidance children entered bimonthly program of re-evaluation. One professional who participated in the initial examination performed the follow up appointments using the same initial clinical parameters. When the malocclusion was considered corrected, the child entered in a biannual follow up appointment until s/he turned 5-years old.

We observed in all the cases presented that, regardless of the habit, after its removal there was a regression of malocclusion achieving the occlusal relationship (Figures 2A, 2B and 2C).

**Figure 2.** Characterization of the final occlusion after removal of habits: A) patient 1; B) patient 2; C) patient 5

Discussion

The anterior open bite is one of malocclusions that affects dental and skeletal alterations providing great aesthetic and functional impairment, thus presenting relevant connotation in public health because of its high prevalence.^{5,6,9,15} Based on the above, this study is of great importance, since the adoption of preventive measures to this problem at an early age is an excellent health action strategy for both, private networks and to the public sector. This way programs could be deployed to improve the community's quality of life. Therefore, clinical proposal evaluation with a number of case reports may show for clinical purposes the right time to intervene and provide better quality of life for patients, since the detection and early guidance on the removal of timely habits has great relationship with self-correction of malocclusion.¹⁴

The anterior open bite is mainly related to harmful oral habits like thumb sucking / pacifiers and bottle feeding.^{9,12,13,15} According to Tomita *et al.*¹⁶ malocclusion was 5.46 times higher in children who used a pacifier compared to those who did not use it (OR = 5.46, 95% CI: 3.65 to 8.19, $p < 0.001$) and was present 1.54 times more frequent in children with the habit of finger sucking. According to Silvestrini-Biaviti *et al.*⁹ children with open bite and who were pacifier sucking, between 3 and 5 years old had their prevalence of 66.7% and 58.5%. However, those having digital sucking habit the prevalence was 12% in children aged 3 years old and 19.5% in children under 5 years old - the pacifier being the greatest risk factor. According to Antunes *et al.*¹³ artificial feeding is presented as a risk factor for the acquisition of oral habits and their consequent malocclusions. The cases presented in this study are in line with this relationship habits and malocclusion proposed in the literature. This study showed that the harmful oral habits of finger sucking, pacifier or bottle feeding removed in time resulted in spontaneous regression of anterior open bite malocclusion.

The reversal of the anterior open bite malocclusion can be achieved by the use of orthodontic appliances reminders that assist in the suppression of harmful habits, such as non-nutritive sucking and tongue thrust, enabling the earlier development dent alveolar without interference, being more indicated in deciduous stages and mixed dentition.¹⁷ Prevention at an early stage is ideal. Removal of sucking habits in children in primary dentition stage may provide the correction or attenuation of this malocclusion, the adequacy of structures and the redirection of the stomatognathic system functions. However, in some cases, habits removal cannot promote complete adaptation of these functions, therefore, indicating the use of orofacial myofunctional therapy for promoting increased muscle strength, leading to positive changes in functional patterns, and thus preventing deviations in the craniofacial development.¹⁸

According Burdi and Moyers¹⁰ early treatment simplifies or eliminates the need for corrective treatment in the permanent dentition. The essence of early treatment arguably consists of exploitation of the young patients growth to encourage self-correction of dental skeletal deformities. According to Vig and Fields,¹⁴ the earlier the child gets the right training behaviors early will be the removal of the habit, but the limitations of the child must always be respected. Therefore, the greater the family's participation in the development process, the easier the cooperation of the child, which greatly influenced the harmful habit removal.¹⁴ Therefore, corroborating these authors, family awareness was fundamental in the habit removal process with consequent regression of malocclusion. According to Antunes *et al.*,¹³ breastfeeding was considered a protective factor and, therefore, should be emphasized to parents because of their great importance in the development of the dental arch and preventing installation of harmful oral habits such as sucking digital, pacifiers and bottle, being important to implement preventive programs to encourage breastfeeding.

However when the habit is already installed, it is important to occur early identification of malocclusion to be taken measures to prevent and control, so that the dentist and parents are able to have the child leave the habit at the right time, thus leading to a spontaneous regression of malocclusion. Based on the above it is important to inform the population about the consequences brought by the harmful oral habits. The dentist is a professional in the health field who should be able to diagnose, guide and teach prevention habits. This professional should be engaged in breastfeeding campaigns, should explain to expectant mothers and new mothers the dangers of artificial feeding and the relationship between it and the harmful oral habits and what they can bring. With the clarification, parents would act preventively together with health professionals thus contributing to the decline of the great statistics of children with malocclusion.

This study deals with the presentation of a series of cases once we had a considerable sample lost, mainly due to the distance from their homes to the local of Dental Care Extension Program. It can be pointed as a limitation. These series of cases studied do not provide information to compare treatments; neither can be the basis for opinions on etiology. This is because they are not comparative studies. The views on the etiology, prevention and treatment, often found in the conclusions of the case report articles should be seen as the first link in a chain of evidence to be obtained, rather than a definitive opinion. Even with these limitations, these studies are fundamental to the advancement of knowledge. Thus, it is suggested that from this study other longitudinal studies emerge - randomized studies that prove this study with more scientific evidence.

Conclusion

Based on the number of submitted cases it was found that children with anterior open bite, after guidance and

habit removal in good time, had spontaneous regression of this malocclusion.

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