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Atypical swallowing behind an unusual case report of anterior open bite and an anterior midline Diastema

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Abstract

Atypical swallowing is a my functional problem consisting of an altered tongue position during the act of swallowing, connection with the presence of malocclusions such as anterior open bite made it a topic of strong interest and discussion in science.

Anterior open bite is considered a malocclusion that still defies correction, especially in terms of stability, midline Diastema create an unpleasant appearance for individuals, sometimes it may lead to phonetic problems, particularly in cases with wide space. This article describes a clinical rare case of a severe anterior open bite and an unusual midline Diastema which resulted from an atypical swallowing and shows the importance to set up an early my functional rehabilitation procedure to correct the oral habit and to prevent such malocclusion with consequences on aesthetics and self-confidence.

Keywords: Atypical swallowing, anterior open bite, adult

Introduction

Teeth and alveolar bones are exposed to antagonistic forces and pressures from muscle function, which may in part determine the position of the teeth. On the other hand, the intrinsic forces of the lips and tongue at rest generate the balance required to position the teeth ^[1].

Based on this idea of balance several etiological factors related to oral function have been associated with AOB (Anterior open bite). For example, sucking habits, presence of hypertrophic lymphoid tissues, mouth breathing, atypical phonation and swallowing, and anterior posture of the tongue at rest.

The swallowing mechanism model in childhood physiologically implies the interposition of the tongue between the bony bases, while in adults the tip of the tongue places itself on level with the incisive papilla. A failed transition to the adult model and the persistence of a childlike deglutition mechanism is a pathologic condition called atypical swallowing ^[2].

From the etiologic point of view, there are two kinds of atypical swallowing:

- The *primary atypical* swallowing has a psychological cause, parental over-nursing, and is often associated with a general childish behavior
- The *secondary atypical* swallowing is caused by physical factors, such as
- Oral habits (thumb sucking, nail biting, bruxism)
- Prolonged artificial breastfeeding
- Short frenulum
- Genetic factors as palate and airways morphology and hereditary dysmorphia
- Hypertrophic adenoids, allergic rhinitis leading to oral breathing
- Abnormal head, lower jaw and tongue posture

Werlich visited 640 children from elementary and junior high schools, and found that 30.4% suffered from atypical swallowing and 98.5% had an anterior open bite ^[3].

Anterior open bite (AOB) is defined as the lack of incisal contact between upper and lower anterior teeth in centric relation ^[4]. Prevalence in the population ranges from 1.5% to 11% ^[5]. The age factor, however, affects prevalence, since sucking habits decrease and oral function matures with age. At six years old 4.2% present with AOB whereas at age 14 the prevalence

decreases to 2% [6]. Despite its low prevalence, the demand for treatment of this malocclusion is very common as approximately 17% of orthodontic patients have AOB, [5] which means that professionals should treat it in an effective and stable manner [7].

The midline Diastema is a space (or gap) greater than 0.5mm between the mesial surfaces of maxillary central incisors, it creates an unpleasant appearance for individuals, sometimes it may lead to phonetic, esthetic, psychological, and functional concerns [8]. However, the maxillary midline Diastema is a normal growth feature of children in the primary and mixed dentition period which decreases or completely closes by the medial eruption of the maxillary lateral incisors and canines in childhood. For some individuals, the spaces remain after the transition of dentition and this is due to many reasons such as:

- Heredity and Ethnicity: A familial incidence of Diastema has been shown

- Dent alveolar Discrepancies (Tooth Size and Arch Length Discrepancies)
- Midline supernumerary teeth
- Proclination of the upper labial segment
- Enlarged Labial Frenum and Deficient Intermaxillary Suture [9-10]

Observation

A 35-year-old male patient was referred to orthodontic treatment by his dentist with a complaint of aesthetic deficit due to an anterior Diastema. The patient reported that he suffered from thumb sucking in childhood and had good general health.

Physical examination revealed a square face with an equality of facial thirds, poorly developed cheekbones, slightly convex facial profile with a well-developed chin, a normal nasolabial angle, an inferior porcelain due to protrusive inferior teeth and a toothless appearance smile (Fig 1).

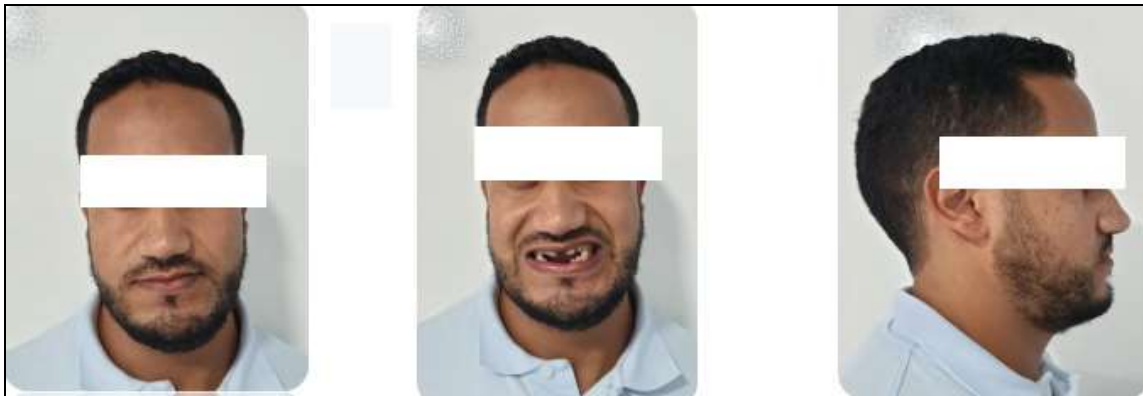


Fig 1: Extrabuccal photographs

On intraoral examination, it was observed low caries risk, poor hygiene, a general gingivitis, the presence of all teeth with a tartar deposit, Angle's Class I molar and canine occlusion, 5 mm open bite extending to the canines, 6mm front superior interincisive Diastema and a 15mm inferior interincisive Diastema, inverted anterior occlusion, tongue thrust (Fig 3), and a slight macroglossia, no short frenulum, and no mouth breathing were noticed during the examination.

(Fig 2).

Future orthodontic treatment was proposed to the patient with the aim to eliminate the abnormal tongue thrust, close the anterior open bite and the Diastema, preserve Class I molar and normal overbite, correct midline, align and level the teeth with a fixed appliance in the permanent dentition after periodontal management.



Fig 2: Intrabuccal photographs



Fig 3: Intrabuccal photograph showing anterior tongue thrust

Discussion

From our consultation, we could conclude that the malocclusion was the consequence of childhood delayed thumb sucking, tongue thrust and macroglossia. This case report can be considered as an unusual result of these factors.

The treatment of malocclusions characterized by anterior open bite in nongrowing patients represents one of the most difficult challenges in orthodontic practice^[11].

Over the years, vertical facial pattern was ultimately considered as the main risk factor for AOB and its treatment instability. However, other studies^[12] have reported that most hyper divergent patients exhibit a normal or excessive overbite while patients with normal facial patterns display a "persistent open bite.

Treatment planning must be based on the assessment and evaluation of every individual case which may be unique. Some cases may undergo spontaneous improvement without any treatment.

A variety of treatment philosophies and appliance techniques have been used in the correction of anterior open-bite^[13].

For the treatment, two factors must be analyzed: treatment objectives and the stability of the specific case. The therapies recommended for the correction of this malocclusion can be orthopedic or orthodontic, with the aim of promoting dental or dent alveolar compensation.

The treatment can also be performed with the aid of orthogenetic or orthopedic surgery for skeletal correction. Surgical correction can be indicated for nongrowing patients with skeletal alterations^[14].

The treatment and the interception of harmful habits, should preferentially be performed in the mixed and deciduous dentitions, phases that offer better physiological conditions to the restoration of the normal relationship^[15], among the experts, it seems to be consensus that the satisfactory contention of a malocclusion, to adulthood, is a bigger challenge than its own fix.

The main goal of the orthodontic treatment has been the stability, a fundamental condition to the aesthetic and functional correction. It is important to ensure the proper occlusion preserving the normal muscle balance. In fact, there are many explanations for the instability of the correction of AOB, among them the non adaptation of the tongue, independently of the intervention that was performed.

However, the early identification of deviation and the elimination of the causes, by accurate controls, increases significantly the stability of the correction^[16].

Conclusion

The early diagnosis of the anterior open bite decreases the time of treatment and simplifies the management procedure. The treatment of anterior open bite requires, mostly, multidisciplinary approach. Due to the high rate of unstable results with relation to the period of treatment and post-treatment of anterior open bite, more research is needed in this area.

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