Bad Habbits: Key features and diagnostic Importance

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Abstract

The term "bad habit" is used to indicate a large number of abnormal neuromuscular behavior, that affects large part of child population. Thumb sucking, oral breathing and atypical swallowing can cause several problems in the oral cavity, but also interfere with the normal growth and function of the whole stomatognathic system. The orthodontist must know their main aspects in order to make an early diagnosis and prevent the perpetuation of these habits. The aim of this review is to summarize the key features of the bad habits and highlight the importance of a correct diagnosis.

Introduction

The term "bad habit" is used to indicate a large number of abnormal neuromuscular behavior.

The normal development of the maxillofacial complex and the typology of its growth is influenced by intrinsic and extrinsic factors of the subject, including the genetic heritage. Musculoskeletal characteristics of the subject depend also by its growth typology and, many times, the establishment of a malocclusion is caused by dysfunctions and parafunction of orofacial muscles.

Bad habits can be classified as follows:

a) Constitutional or anatomical anomalies of the characters proper to muscles (e.g. microcheilia, macrocheilia, microglossia, macroglossia)

b) Neurophysiological abnormalities or dyskinesias (e.g. atypical swallowing, dyslalias)

c) Other disorders associated with parafunctions

Each prolonged neuromuscular imbalance often leads to dentoskeletal dysmorphoses of varying degrees.

An eugnatic growth, in fact, depends on the existence of an equilibrium both static and dynamic of all orofacial muscles, whose activity is divided into antagonistic muscle groups.

The damages caused by the bad habits vary for: age of onset, duration, intensity, type, biotypologic characteristics. A feature of many bad habits is the open bite.

Open bite etiology

1. Thumb Sucking during childhood
2. Position taken by the tongue during deglutition
3. The proportions of the various components of the skeletal system

The influence of different causes on the determination of the open bite has been investigated by many authors over the years.

Bell and Proffit findings showed that in 8,000 six years children, 11% males and 15% females suck their thumbs, and the 80% of these children has an anterior open bite. Other studies have demonstrated that the black race has open bite with a rate four times greater than the white race. These authors argue that the pressure of the tongue, resulting from improper deglutition, is not responsible for an open bite (that is commonly seen in children and in 15% of adults) but it is the result of an adaptation to the open bite, rather than the cause.

Worms, Meskin and Isaacsonn, have studied the spontaneous correction of the open bite arguing that there is a factor of self-correction inherent to maturation. They studied 1408 Navajo children between 7 and 21 years old, their main finding regards a self-correction of anterior open bites for the 80% because of the maturing of the swallowing reflex itself, the transition from the stage of mixed dentition, and finally the skeletal growth at the age of 12.

Furthermore Mason and Proffit discovered that the thrust of the tongue is observed in 50% of children at the age of 8, with an experience of 4% of open bite, both percentages fall with the progress of age. The 80% of children with open bite and atypical swallowing at the age of 8 had independently an improvement within 12 years.

The abnormal functional patterns of the tongue has been discovered by Gershater. He studied 65 children with mental retardation and emotionally disturbed. An high incidence rate of open bite (32.3%) has been attributed to their neuromuscular patterns or models that were poorly developed, as well as damaging oral habits. Many of these children denote the lack of the neuromuscular control necessary in view of a proper and appropriate operation of the tongue, of the mouth and of the swallowing diagram; therefore the occurrence of an open bite is a natural
result in these cases.  
_Harvold and McNamara_ with their animal studies showed that the rest position of both the tongue and the lips is determined by the needs of respiration. By creating an obstruction to nasal breathing was produced an open bite. (7,8,9)

_Hanson, Barnard and Case_, in a study on 214 children of 4-5 years, claimed that an obstruction of the airways that occurs in the form of an enlargement of the tonsils and adenoids does have its effect on the growth and development of orofacial structures. (10)

Through the growth, the rapid hyperplasia of tonsillar and adenoidal tissue slows down resulting in atrophy. At puberty, the tonsils and adenoids shrink and the maxilla grows. The tongue has more space and takes a higher position without any influence on breathing. As soon as the change takes place from the rest position, the tongue thrust swallowing tends to disappear, leading to a lower incidence of open bite.

**Discussion**

**Oral Breathing**

Mouth breathing is a symptom of several diseases, not only of the stomatognathic system but also of other districts of our body.

Breathing should occur effortlessly through the nose, while the lips are naturally competent; in particular the lower lip should rest on the bottom of the 3rd buccal surface of the upper incisors. In the posture of rest, in addition, the upper and lower lip just touching, and could only remain between them a space of 2 or 3 mm. The muscles of the face never attend in respiratory function.

Only under abnormal conditions motor responses are activated for the orofacial sphere, for example the active lowering of the mandible in the obstruction of the nasal or pharyngeal cavities.

By the passage of air through the nose and paranasal sinuses, nasopharynx improves its thermal and hygrometric properties. The mucus secreted by calciform cells captures dust and leukocyte of the lymphocyte layer catch germs. In addition, the bulbar respiratory center i is stimulated through trigeminal reflex phenomena. When a patient breathes constantly with the mouth, is in a condition of respiratory insufficiency. The oral breathing is also responsible for the Sinobronchial syndrome, with inflammatory processes of paranasal sinuses, bronchi and pharynx, tonsillitis, otitis, etc. (11)

It is generally believed that orthognathic growth is associated with nasal breathing and the disgnatic one is frequently combined with oral breathing. It is, however, more correct to say that, in relation to the etiology of the oral dysmorphoses, mouth breathing can act in three different ways (9,12)

- **cofactor** (e.g. in a disgnatic organic matrix, genetically pre-determined, mouth breathing can act as an exogenous cofactor)
- **predisposing exogenous factor**
- **inducing factor** (e.g. in an eugnatic organic matrix, mouth breathing may act as a primary etiologic environmental cofactor in a causing or predisposing way)

**Etiology:** local and general causes for this habit are recognized.

**GENERAL**

- chronic respiratory disease
- cardiovascular
- asthma
- allergies
- endocrine diseases of the nervous system
  - (hypotonia), which results in a limited diaphragmatic kinetics, lower jaw

**LOCAL**

- neoformations (cysts and tumors)
- inflammation of the paranasal sinuses
- chronic rhinitis (allergic and vasomotor)
- nasal polyposis
- turbinate hypertrophy
- chronic pharyngitis
- adenotonsillar pathology
- dento-maxillo-facial dysmorphoses
- hereditary, hypotonia of the facial muscles  
  - (orbicularis and masticatory)
- other bad habits

**DIAGNOSIS**

For diagnostic purposes, is very important to assess the posture and competence of the lips, but not in a stress situation (e.g. in front of the television, during sleep). In addition to different semiological respiratory function tests (e.g. Robin, Glazel, RAA), the study of soft tissue on Latero-lateral Teleradiography is suitable to assess the patency of the pharyngeal hiatus. On this RX, in fact, we evaluate the position of the tongue, the velum palati, and the space between adenoids and soft palate. Clinically, the oral respirator presents pathognomonic characteristics.

**General appearance**

- longitipo
- asthenic or biotype ectomorph
- narrow rib cage, poorly developed
- keeled sternum
- winged shoulder blades
- hunched shoulders
- kyphotic column
- cranial extension posture
- dysgnathia: 2nd Class 1st Division, more rarely, 3rd class

Adenoid facies (pathognomonic sign):
- eyes with gray skin alone for venous stasis, caused by congestion of the nasal mucosa
- narrow nostrils
- incompetent lips
- short upper lip with jaw lowered
- low lingual posture
- long narrow face

Clinically:
- increase in vertical dimension
- hyperdivergent skeletal pattern
- mandibular postero-rotation
- maxillary transverse diameters decrease with vestibule version of the front teeth

The functional transverse contraction of the palate is caused by the imbalance between centrifugal action of the tongue and centripetal action of the cheeks (buccinator strength isn't balanced by the pressure of the tongue on the palate and the upper arch). In case of symmetrical contraction, the mandible may deviate to one side causing a cross bite. The tongue can have different positions: it may be low and push the mandible, or high and push against the upper teeth.

ATYPICAL DEGLUTITION

Deglutition normally follows chewing, but it may also occur after the ingestion of liquids or saliva only. It occurs 1400-2400 times/24 hours and lasts for one second, on average two deglutition/60” during the day, and one deglutition/60” during the night.

Swallowing mechanics is modified according to the different periods of life. In fact, from the physiological “infant” model of swallowing in the early years of life, we pass to an unstable swallowing, called “transitional”, to a definitive model, the “adult” one.

To interpose the tongue is normal for the infant (in 97.2% the tongue pushes forward between dental arches), but at the age of 10 at least the 70% of patients have a typical pattern of swallowing.

The “atypical swallowing” represent a pathological mechanism characterized by the permanence of the infantile swallowing pattern: push or interposition of the tongue between dental arches (tongue thrust). Swallowing takes place through a series of coordinates muscle contractions that bring food bolus and saliva from the oral cavity to the stomach. About twenty muscles (masticatory and lingual) contribute to its development, but never mimic ones.

Deglutition can be divided into different stages, according to the anatomical area in which it occurs:

1. preparatory phase
2. oral phase (conscious and voluntary)
3. pharyngeal phase (conscious and involuntary)
4. esophageal phase (unconscious and involuntary)

Now look at how we place the tongue in the different kinds of deglutition. (14)

Infantile swallowing: the tip of the tongue insinuates between the gum pads in contact with the lower lip; lips, cheeks and tongue contract synergistically. The mandible is stabilized by facial muscles. During lactation, the condyle goes back and forward in the glenoid cavity.

Adult swallowing: the tip of the tongue is at the level of the interincisal papilla, while the median part adheres to the palate and the rear portion is in contact with the rear portion of the soft palate. Initially, the extrinsic muscles of the tongue acting (mylohyoid); then, began a series of tongue intrinsic muscles contractions that squeeze the food bolus toward the pharynx. The tongue tip never moves from its anterior point of support, and exerts a pressure of about 100g/cm²; the whole swallowing exerts a pressure of about 2 kg.

In the atypical deglutition, instead, the tongue pushes against the teeth or between the teeth, in anterior or posterior position, unilateral or bilateral. When the tongue pushes on the incisors, its median part is lowered and does not adhere to the palate; its posterior part pushes against the hard palate back edge, and the tip is placed between incisors (it meet the lower lip’s internal surface).

Masseter, temporal and pterygoid muscles are usually hypotonic (hypodinamia). The perioral musculature, instead, is characterized by hyperdinamia (orbicularis and mental muscles). The facial muscles are involved to create a good oral anterior seal, thus offering to the tongue a solid base for pushing the bolus back.

The atypical swallowing fundamental event, then, is the anterior displacement of the tongue, with the alteration of muscular dynamics and the resulting abnormal mandible posture.

ETIOLOGY

There are several factors that lead to the establishment of this bad habit: presence of
hypertrophic tonsils/adenoids (that decrease the pharyngeal hiatus patency, causing the mandibular lowering and the anterior displacement of the tongue to facilitate breathing) macroglossia, short lingual frenulum (that restrict tongue movement), neuromotor dysfunction, dentoskeletal deformities, other bad habits such as thumb sucking, etc.\(^{(15)}\)

The malocclusion most frequently associated with the atypical swallowing is the open bite (dental or skeletal). The open bite can be anterior or posterior, unilateral or bilateral, depending on the localization of the tongue movement. Teeth may be inclined vestibularly because of the prevalence of lingual muscle strength than the perioral. Some authors suggest that in the patients with open bite the atypical swallowing is the result of the malocclusion, and not its cause, for the tongue tendency to fill the empty spaces of the arches.

**THUMB SUCKING**

The most common attitude is one in which the thumb ventral surface pressed against the palate while the hand pressed against the mandible, the index rubs the cheek or the nose.\(^{(16)}\)

The etiology of this bad habit seems to be multifactorial, and it is important to understand the period in which it establishes. There are several etiological theories, as that of the “oral guide”, whereby the sucking of the thumb or of any other object is part of a learning neuromuscular process common to all mammals. According to the classical Freudian theories, in a child the oral cavity is the first part of the body that provides him pleasure and allows him to establish a relationship with the outside world. At four or five years of age, there may be several causes for the permanence of thumb sucking, referable to situations of psychological distress (phenomenon of “regression”).

The dysmorphoses onset depends on several factors, such as the time, the intensity, the place of application, the position of the hand, the skeletal type and its enduring.

**Maxillary features**: increased overjet, decreased transverse diameters, deep palate, floor of the nose smaller and placed higher.

**Mandibular features**: more distal position that alters the normal sagittal relationship. The weight of the hand and/or of the arm will lead to a negative effect on the development of the temporomandibular joint in growing patients. In addition, is noted an imbalance of the orofacial musculature, the lower lip becomes hyperactive because it has to participate in swallowing to realize the front seal.

**Conclusion**

The diagnosis of a bad habit is essential to avoid the establishment of a dentoskeletal dysmorphoses.\(^{(17,18)}\) The presence of a dental open bite with flared upper front teeth, in subjects in Angle Class I or II, may suggest the presence of an altered balance of the oral musculature caused by an excessive predominance of centrifugal forces. If we note, instead, lingualized lower incisors, we can think about thumb or lip sucking, or other parafunctional habits. When we see an open-mouth postural attitude, likely we are in front of an oral respirator.\(^{(19)}\) Therapeutically, it is very important to correctly diagnose the presence of one of the bad habits described above, which are not always clearly identifiable. In the case of a muscle imbalance, we must first bring the situation back to the normal functional, and then take care of the orthodontic problem. Only when the function is restored will we be more confident, at the end of treatment, to avoid a recurrence.\(^{(20,21,22)}\)

**Bibliography**

14. Bandettini G., G. Blasi, Castaldo A., M. Viti; Alcuni aspetti della deglutizione atipica e anormale” Stomatologia Lombardo veneta, anno IX, n. 3-4 1995