DELETERIOUS EFFECTS OF ORAL HABITS

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ABSTRACT

"A habit is a fixed practice produced by constant repetition of an act (Thompson 1927). At each repetition the act becomes less conscious and if repeated often enough may be relegated to the subconscious mind entirely". Habits are learned patterns of muscle contraction of a very complex nature. Certain habits serve as stimuli to normal growth of the jaws; example normal lip action and mastication. Abnormal habits, which may interfere with the regular pattern of facial growth, must be differentiated from the desired normal habits that are a part of normal oropharyngeal function and thus play an important role in craniofacial growth and occlusal physiology. Deleterious habitual patterns of muscle behaviour, often are associated with perverted or impeded osseous growth, tooth malposition[1], disturbed breathing habits, difficulties in speech, upset balance in the facial musculature and psychological problems. Therefore, one cannot correct malocclusion without involvement in such reflex activities.

INTRODUCTION

Habits are one of the major etiologic factors[2] which will leads to malformation in dento-facial structures.Certain habits serves as stimuli to normal growth of jaw and certain causes abnormal growth. Deleterious habitual patterns of muscle behaviour, often are associated with perverted or impeded osseous growth, tooth malposition, disturbed breathing habits, difficulties in speech, upset balance in the facial musculature and psychological problems. Therefore, one cannot correct malocclusion without involvement in such reflex activities. So the management of habits always be a multi disciplinary in nature. Habit s are the most frequent cause of these malformations mostly seen in the early child hood and mixed dentition stages.Sometimes in aduthood.so in my article I m going to discuss about the deleterious effects of oral habits.

The development of various reflexes - intrauterine life

- By 14th week of intra uterine life- stimulation of lips causes the tongue to move
- At about the same time stimulation of upper lip causes mouth closure and even deglutition
- Gag reflex develops by about 18 ½ weeks
- Respiration by about 25 weeks
- Sucking by 25 weeks
- Sucking and swallowing by 32 weeks.

Sensory guidance for all activities including jaw movements covers a large area and includes multiple contacts for sensory inputs (tongue, lips, soft palate, posterior pharyngeal wall and TMJ)[3]. A brief review of the forces acting on the bony structures to shape them during the developmental stages helps us in understanding the changes that pernicious oral habits can bring about in the oral architecture.

Some Antagonistic Forces Acting on the Masticatory Apparatus

- Lip – tongue
- Cheeks – tongue
- Eruption of teeth – masticatory muscles masseter, temporalis and medial pterygoid
- Air pressure of the skin - tongue (in closed mouth)
- Air pressure in nasal cavity –tongue (open mouth)
- Masseter – elasticity of periodontal ligament (particularly of molars and suprahyoid muscles).
- Internal pterygoid – same as masseter in vertical movement.
- External pterygoid in anterior movement – posterior one third of temporalis, suprahyoid group, digastric and muscles of neek.
- External pterygoid in lateral movement – external pterygoid of opposite side

In 1942, Breitner stated that there should be a balance between the forces of the tongue from within the dental arches and compensating action of the lips and cheek musculature. He called this as functional equilibrium.

Buccinator Mechanism[4]:

Muscles are a potent force, whether they are in active function or at rest. A resting muscle still is performing a function that of maintaining posture and a relationship of contiguous parts. The teeth and supporting structures are constantly under the influence of the contiguous musculature. Aberrations of muscle function can and do produce marked malocclusions. The restrictive, guiding role of the buccinator mechanism must be emphasized.

Starting with the decussating fibers of the orbicularis oris muscle, joining right and left fibers in the lips, the buccinator mechanism runs laterally and posteriorly around the corner of the mouth, joining other fibers of the buccinator muscle which insert into the pterygomandibular raphe just behind the dentition. At this point it intermingles with fibers of the superior constrictor muscle and continues posteriorly and medially to anchor at the origin of the superior constrictor muscles, the pharyngeal tubercle of the occipital bone. Opposing the buccinator mechanism is a very powerful muscle the tongue. Balance between these muscle forces is very important. Any deviation in these reflexes or mechanism leads to malocclusion.

Thumb sucking habit[5]:

Gardiner et al have found the incidence of thumb sucking is more than 50%. In the majority of cases the habit is abandoned by the age of four years and causes little permanent damage. Continuation of the habit past the age at which the permanent incisors erupt may however, prove detrimental. The more persistent the habit the greater its contribution to the disturbance of forces operating on the teeth. It is better to regard sucking habits as a normal feature of infant behaviour, certainly upto the age of 3yrs. Types of maloccluion that may develop depends upon a number of variables:

- Position of the digit
- Associated oro-facial muscle contractions
- The position of the mandible during sucking
- The facial skeletal pattern
- Force applied to teeth and alveolar process

Trident of habit factors

1. Duration
2. Frequency
3. Intensity

SequelaE of thumb sucking[6-9]

Theoretically it is possible to draw a very neat sequence attributing a total maxillary protrusion, while the increased pressure from buccinator mechanism activating pterygomandibular raphe just behind the dentition and forcing the maxillary teeth forward.

1. Anterior openbite – interference with occlusal movement of the incisors. This openbite can lead to tongue thrusting problems and speech difficulties.
2. Proclination and spacing of the maxillary anterior teeth[10] if thumb is held upward against the palate. Prominences of this labially posed incisor make them particularly vulnerable to accidental fractures.
3. Increased overjet.
4. Mandibular postural retraction may develop if the weight of the hand or arm continuously forces the mandible to assume a retruded position in order to practice the habit. Pressure in the lingual direction causes lingual tipping of mandibular incisors.
5. When maxillary incisors have been tipped labially and an openbite has developed it becomes necessary for the tongue to thrust forward during swallowing in order to effect an anterior oral seal - “compensatory tongue thrusting”.
6. During thumb sucking, buccal wall contractions produce, a negative pressure within the month, with resultant narrowing of the maxillary arch – bilateral posterior cross bite may be produced[11].
7. With these changes in the force system in and around the maxillary complex it is often impossible for the nasal floor to drop vertically to its expected position during growth. Therefore thumb suckers have a narrow nasal floor and high palatal vault.

8. Upper lip becomes hypotonic and lower lip becomes hyperactive. These abnormal muscle contractions during sucking and swallowing stabilize deformation[12].
9. Compensatory tongue thrust, retained infantile swallowing pattern, abnormal perioral muscle function will assist the thumb sucking in producing the malocclusion.

Depending on the habit involved, there may be a tendency to produce an over eruption of the posterior teeth thereby increasing the open bite[13]. There is a good clinical evidence to show that the deglutition maturation is retarded in confirmed finger suckers. The infantile swallow or transitional period is prolonged. This may be the most significant factor is deforming the mechanism.

Persistent sucking habits frequently occur in cases where the oro-muscular behaviour or the dental base relation are already unfavourable to the development of good occlusion. In these cases the habit only contributes to a condition that is likely to remain even though the habit ceases. Where the oro-muscular behaviour is favourable an intractable malocclusion is less likely to be produced by the habit and there is a spontaneous improvement once the habit has ceased.

There can be a marked mentalis muscle contraction[14-18], which compresses the lower lip inward on swallowing. The lower lip can slip up and make a seal (during the swallow) lingual to the upper anteriors, not labial as is usual. This increases the overjet and can make for a vicious circle perpetuating the openbite and upper labial protrusion. This is because the mentalis contracts on swallowing, flattening the lower lip strongly against the labial surfaces of the lower anterior teeth. At the same time the lower tip may contact the lingual surfaces of upper anteriors with some force during the last of the swallowing spasm. This unequal force generated against the teeth by the perioral musculature may serve to perpetuate the malocclusion long after the original sucking habit has disappeared.

TONGUE THRUSTING[19]:

EFFECTS AND CLINICAL FEATURES OF TONGUE THRUSTING

SUBTENLEY and SUBTELNY (1962)

In patients who continue to exhibit a tongue thrust pattern of swallowing, it is marked by:

a) Contraction of circumoral musculature
b) Separation of maxillary and mandibular posterior teeth.
c) Protrusion of tongue between incisors

PROFFIT and MASON (1975)

Tongue thrusting is one or a combination of 3 conditions:

- Forward placement of tongue during swallowing so that the tip of the tongue contacts the lower lip.
- Inappropriate placement of the tongue between or against the anterior dentition during speech.

Forward positioning of the tongue at rest so that the lip is against or between the anterior teeth.

Clinical manifestations may include the following:

A person with tongue thrust may demonstrate one or more of the following signs or symptoms:

- Facial grimace and/or pursing of the lips when swallowing.
- Mouth breathing due to allergies or enlarged tonsils and adenoids.
- An openbite condition of the teeth.
- Difficulty with speech, especially the s and z sounds.
- When at rest an open mouth position with a forward tongue posture is noted.

Example, while watching television or reading a book.

Melson et al(1987) stated that both tongue thrust swallow and teeth apart swallow favour development of disto-occlusion, extreme maxillary overjet and open bite.

Mouth breathing:

EFFECTS OF MOUTHBREATHING

EFFECTS UPON GENERAL HEALTH AND GROWTH

Purification of the inspired air[20]: The nasal airway filters heat and humidifies the air in preparation for entry into the bronchi and

lungs.When air is inspired through the mouth, it is not cleaned, warmed and moistened, secretion of mucus is stopped gradually.The irritants accumulate resulting in local inflammation discomfort and pain. The child is usually restless and is affected by repeated cold, cough; glandular fever etc looses general body resistance to other diseases.

Pulmonary development: The functional airway also creates a proper amount of nasal resistance so that the diaphragm and intercostals muscles must perform work to create the negative pressure to promote airflow into the lungs.With oral respiration the resistance is lacking and poor pulmonary compliance is seen. This gives the appearance of pigeon chest.

Lubrication of esophagus: Since the esophagus contains no mucous glands, the mucous from the nose and pharynx serves to lubricate the esophagus.In mouth breathers the oral pharynx is dry and the mucous collects often to be expectorated. This denies the esophagus essential lubrication and can produce a low grade esophagitis.

Blood gas constituents: Blood gas studies reveal that mouthbreathers have 20 percent more carbondioxide and 20% less oxygen in the blood.

Thorax: The diaphragm muscle movements become impaired and due to air swallowed during breathing the child develops a pot belly.

Head: In order to breathe, the child bends the neck forward straightening the oro-nasopharyngeal path.

Ear: Mouth breathing may lead to otitis media.

Speech defects: The speech acquires nasal tone.

Smell: The sense of smell is diluted and with it taste sensations and appetite are affected.

Lymphoid tissues: Adenoids become hyperplastic due to chronic inflammation and may occlude the Eustachian tube resulting in defective hearing.

EFFECTS ON INTRA ORAL STRUCTURES[21-22]:

Moulding action of upper lip on incisors is lost thereby resulting in proclination and spacing of maxillary anteriors.The lower lip is heavy and everted. Tongue is suspended between upper and lower arches resulting in constriction of buccal segment. V-shaped maxilla and high palatal vault. This is due to lack of normal musculature stimulation from the tongue and owing to the increased pressure on the cuspid and primary molar areas by the strained orbicularis oris and buccinator muscles, the buccal segments of the maxilla collapse giving a V shaped maxilla and a high palatal vault.And the pts are more likely to have posterior dental cross bite. Anterior open bite may be seen in mouth breathers.Mandible is rotated in a clockwise manner so that the mandible is in a more vertical and backward direction, causing elongation of the lower anterior face height, open bite and retrognathia .Mandible shows more obtuse gonial angle.Some people may appear to be mouth breathers because of their mandibular posture or incompetent lips. It is normal for a 3-6 year old to be slightly lip incompetent. Clinical judgment is not accurate enough to confirm a diagnosis of nasal airway impairment. The only reliable method of determining the mode of respiratory function is to use a plethysmograph and air flow transducers to determine total nasal and oral air flow Respiratory speeds are the primary determinant of the posture of the jaws and tongue. Therefore it seems reasonable that an altered respiratory pattern could change the posture of the jaws, tongue and head itself.

This in turn could alter the equilibrium of pressures on the jaws and teeth and influence jaw growth and tooth position.In order to breathe through the mouth, it is necessary to lower the mandible and tongue, and extend the headIf these postural changes were maintained, face height would increase and posterior teeth would supra erupt.If there was unusual vertical growth of the ramus, the mandible would rotate down and back, opening the bite anteriorly.

The increasing overjet and increased pressure from the stretched cheeks might cause a narrower maxillary dental arch.

Experimental data for the relationship between malocclusion and mouth breathing are derived

from studies of nasal/oral ratio in normal versus long face children (Fields et al, 1991). The relationship is not nearly as clear cut as theory might predict. About 1/3 of the long face group had less than 50% nasal respiration, whereas none of the normal face group had such a low nasal percentage.But most of the long face groupwere predominantly nasal breathers.

This suggested that impaired nasal respiration may contribute to the development of the long face condition but is not the sole/major cause.

Allergic children also tend to have increased anterior face height and increased overjet/ decreased overbite that tends to accompany it.children who underwent adenoidectomy had longer anterior face height, maxillary constriction and more upright incisors.

The soft tissue imbalance related to mouthbreathing may influence the occlusion. When breathing through the mouth, a person holds the tongue low and forward to keep the oral airway open.The cheeks (orbicularis oris, buccinator) therefore exert a force against the buccal surfaces of maxillary posterior teeth that is not balanced by presence of tongue in palatal area. Also, lips are flaccid since they are held in open mouth position.

Additionally a short upper lip decreases labial support to maxillary anterior teeth and lower lip may be held behind the upper incisors.

This often results in a narrowed maxillary arch (v-shaped with high palatal vault), labial flaring of maxillary incisors and anterior open bite.

Melsan et al. (1987) reported greater prevalence of posterior crossbite in mouth breathing children between 13-14 years of age.

A tendency towards Class II malocclusion was observed. (Hartsook, 1946)

EFFECTS ON PERIODONTAL TISSUES AND DENTAL CARIES[23]:

In mouth breathers, children will hold their lips apart.So the gingiva becomes air-dried and causes irritation.Saliva over the exposed gingiva becomes viscous, debris collects on the gingiva as well as on the tooth surfaces, and the bacterial population becomes enormously increased.Along with the gingivae, tongue and palate also become dry.

Subsequent to mouth breathing, most commonly anterior marginal gingivitis called mouth breathing gingivitis is seen.Marginal gingivitis may even develop on palatal tissues of upper anterior region, even in presence of good oral hygiene.Hypertrophic gingivitis may also be seen, wherein a mouth breathing line/gum ridge is found at the junction of edematous and normal tissues, marking the limit of tissues exposed to air.Due to stagnation of debris and microflora in the maxillary anteriors, these teeth are often affected by dental caries.

Respiration.

CONCLUSION:

As an orthodontist we have to detect the habits early in the patient so that we can prevent and intercept it as soon as possible to get the better results. We also consider the duration, frequency and intensity of habits. With all of these there should be a good corporation between the doctor, parent and the patient so that what we will achieve is the perfect smile.

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