Lec. 3 LOCAL FACTORS OF MALOCCLUSION

BAD ORAL HABITS

Bad Habit is defined as the action which by repetition had become rhythmic and spontaneous. Fixed or constant practice established by frequent repetition, its formed reaction that is resistant to change, whether useful or harmful depending on the degree to which it interferes with the child's physical, emotional and social function.

These habits decrease with increase in age and have no gender differences during infancy but later on it is more demonstrated in females, it is less with bottle feeding than glass feeding and decreases as the feeding time increases. A bad habit for the children between the age of six months until 5.5 years of age has little effect if no any effect on the occlusion but if it continues farther, then its treatment is recommended.

The number of children involves with bad habits seems to be reduced as the child grow, at 2.5 years of age about 65% of children sucks thumb or finger or artificial comforter but at 6 years of age only 55% of the children do the habit; and this percentage reduced to 16.6% at 11 year of age and its rarely to get a person who sucked the thumb or a finger at 15 year of age unless there is a psychological background.

The effect of each habit on the occlusion is really cumulative in nature, so it depending on: Intensity is the amount of force applied to the teeth and supporting bone during habits or sucking. Duration is the total time children spend on habit. Frequency refers to the number of times children practice the habit during the day.

Etiological Agents in the Development of Bad Oral Habits

- Anatomical: For example, posture of the tongue. Infantile swallow occurs due to a large tongue in a small oral cavity coupled with anterior open bite of gum pads.
- Mechanical Interferences: It lead to undesirable oral habits, such as when the permanent incisor is ectopically erupted or missed, this will lead to anterior tongue thrust to achieve the anterior oral seal.
- Pathological: Certain conditions of oral and perioral structures can cause an undesirable oral habit, e.g. tonsillitis, hypertrophy of inferior nasal turbinates (can cause mouth breathing).
- Emotional: Upset children regress towards infancy, assume infantile postures, e.g. digit sucking which gives the child a feeling of security.
- Imitation: Young children are extremely observant and sensitive to environment and highly affected by parents and siblings. The child may imitate jaw positions/speech disorders of parents.
- Random Behavior: Behavior appears purposeless if not completely accidental.

DIGIT SUCKING HABITS (Thumb/Finger-Sucking)

Thumb or finger sucking is one of the most common types of non-nutritive oral habit present in children. Reports indicate that sucking habits are reflexes whose precursors appear during intrauterine life. Ultrasound pictures of intrauterine life have shown fetuses sucking their thumb. Repeated and forceful sucking of thumb/finger with associated strong buccal and lip contractions. Almost all children take up this habit, but eventually discontinue it spontaneously with age and maturation. There are essentially two forms of sucking:

- Nutritive sucking: it is the sucking observed during breast/bottle feeding, which provides nutrition to the infant.
- Non-nutritive sucking: it is the earliest sucking habit adopted by infants in response to frustration and to satisfy their need for contact. Children who neither receive breast feeding nor have access to a pacifier may satisfy their need with habits like thumb sucking which ensures a feeling of warmth and sense of security, however it may be harmful to their dentofacial development.

Diagnosis of Digit Sucking

- History

  When the history of a child's habit is assessed, parents are usually the best source of information. However, indirect questions to the child might also be helpful, for example: "When do you suck your finger?" "Which finger do you use while sucking?"
- Extra oral effect/examination: If these habits persist beyond the time that the permanent teeth erupt then it will cause that the offending digit is exceptionally clean, reddened or even sometimes is deformed. Fibrous roughened callus may be present on the digit and occasionally there may be viral or fungal infection.
- Intra oral effects: Similarly, A persistent digit-sucking habit will act like an orthodontic force upon the teeth if indulged in for more than a few hours per day. The following are commonly associated with a determined habit:

• Increased overjet due to incisor flaring
• Anterior open bite
• Interdental spacing
• Posterior crossbite
• Mandibular incisor crowding
• Lingual tipping of mandibular incisors
• Under eruption of maxillary incisors

• Overeruption of posterior teeth
• Class II molar relationships
• Narrow (V-shaped) anterior maxillary arch

Age of intervention

primary dentition years usually have little if any stop around 4 to 5 years of age (transient).Intervention is recommended after 4 or 5 years of ahould be considered earlier if a high-intensity and long duration are involved occlusion or to the jaw; otherwise the anomaly will resolved spontaneously after habit cessation.

Treatment of Digit Sucking

Discussion (consuling): The simplest approach to habit therapy is a straightforward discussion between the child and the dentist that expresses concern and includes an explanation by the dentist. This "adult" approach is often enough to terminate the habit but is most effective with older children.

Reward system: If the reminder approach fails, a reward system can be implemented that provides a small tangible reward daily for not engaging in the habit. In some cases, a large reward must be negotiated for complete cessation of the habit.

Reminder therapy: It best suited for those patients who desire to stop the habit but need assistance to do so. Includes adhesive tapes, bandages to offending digits, or distasteful liquid/ointments like hot-flavored, bitter-tasting or foul-smelling

preparations, placed on the thumb or fingers that are sucked.

Appliance therapy: Either removable (Hawley) appliance with tongue guard/crib, or fixed appliance like quadhelix or maxillary lingual arch with palatal crib,and bluegrass appliance.

In general, if the child is younger than 3 years, no active intervention regardless of type and severity of malocclusion because of general emotional immaturity, most children outgrow the habit by 5 years of age, and malocclusion is self-correcting if ceased by the time of eruption of permanent teeth. The patient should be at least 7 years old to receive an appliance therapy to reason and understand the need for an appliance. Always parents support and encouragement is necessary to help the child through the treatment period. When sucking ceases, appliance should be retained for approximately 3 months to ensure that the habit has truly stopped.

TONGUE THRUSTING HABIT

It is a myofunctional disorder in which the tongue is brings either between the anterior or posterior teeth during swallowing with or without affecting tooth position. Also it is called deviate, reverse, infantile, immature swallow, etc. In other words, the natural behavior of swallowing cannot be achieved by the affected individuals*.

Classification of Tongue Thrusting

- **Etiologic classification**

a. Physiologic tongue thrust: This comprises of the normal tongue thrust swallow of infancy.

b. Habitual tongue thrust: The tongue thrust is developed due to repeated placement of the tongue.

c. Functional (Adaptive) tongue thrust: The tongue thrust is an adaptive behavior developed to achieve an oral seal.

d. Endogenous tongue thrust: The tongue thrust is due to neuromuscular mechanism.

e. Anatomic tongue thrust: The tongue thrust is due to macroglossia (enlarged tongue).

Sometimes, when the lips cannot produce the anterior oral seal (flaccid or short lips), so the tongue will do this action by thrusting between the teeth as an adaptive measure during swallowing (adaptive swallowing).

- **Backlund classification**

a. Anterior tongue thrust: Forceful anterior thrust leading to anterior openbite.

b. posterior tongue thrust: Lateral thrusting in case of missing posterior teeth leading to posterior openbite.

- **Moyers classification**

a. Simple tongue thrust (teeth together): The buccal teeth are together with a forward positioning of the tongue between the anterior teeth during swallowing, this usually results in production of an incomplete overbite or anterior openbite.

b. Complex tongue thrust (teeth apart): The buccal teeth apart during swallowing, the tongue is positioned between them and does not fill the upper jaw, pressure of muscles of the cheek narrowing the upper arch, leading to buccal crossbite usually unilateral.

c. Retained infantile thrust (endogenous tongue thrust): Persistence of infantile swallowing reflex even after permanent teeth appear. In a small proportion of subjects, the swallowing activity is accompanied by an anterior thrust of the tongue which appears to be a basic neuromuscular mechanism.

This so-called 'endogenous' tongue thrust is sometimes associated with an anterior lisp (sigmatism) during speech. It usually affects the developing teeth to the extent of preventing the full vertical development of the anterior dento-alveolar segments, so that an incomplete overbite or, more usually, an anterior openbite, develops.
The upper and lower incisors may be proclined by the action of the tongue.

Occasionally this type of swallowing activity appears to have no adverse effect on the developing occlusion. The endogenous tongue thrust is fortunately not common, appearing in only 3.1% of the population. A tongue thrust associated with a noticeable lisp and a wide anterior openbite may reasonably be assumed to be of the 'endogenous' type, particularly if a parent has the same condition. This type would not be modified by orthodontic treatment and it must be realized that re-positioning the teeth would not be likely to alter the tongue activity, and any openbite caused by the tongue thrust would be likely to recur (treatment will not always be successful).

Management of Tongue Thrusting

- **3-11 years:** normal occurrence, not to be concerned, reassures parents. If child is under 7 years, there is no need to be concerned since speech sound that elicits a lisp is not matured until 7-8 years of age. Conservative approach demonstrates correct swallow and observe the child.
- **11 years or older:** tongue thrust is not a normal pattern. Treatment options may include; correction of malocclusion, myofunctional therapy, muscle exercises, oral screen, and habit breaking appliances. Muscle exercise done by asking the patient to place the tip of the tongue in the rugae area for 5 minutes and then swallow. However, treatment of endogenous tongue thrust has poor stability.

MOUTH BREATHING HABIT

It is the habitual respiration through the mouth instead of the nose. The main causes of mouth breathing habit are related to nasal obstruction which may be due to hypertrophy of pharyngeal lymphoid tissue (adenoids), defects in the nasal septum, polyps, allergic rhinitis, etc. It may be also habitual mouth breathing when it continues even after the obstruction has been removed.

Effects of Mouth breathing Habit

- 'Adenoid Facies' appearance characterized by long narrow face with underdeveloped paranasal area and small nostrils
- Increased facial height.
- Mandible would rotate down and back
- Posterior teeth would overerupt
- Anterior openbite and increased overjet
- Posterior crossbite, constricted maxilla with narrow shaped palate
- Incompetent, dry, and fissured lips
- Gingival hypertrophy

In addition to the clinical features, mouth breathing habit can be diagnosed by the following tests:

a) Ask the patient to take a deep breath: Most mouth breathers respond to this request by inspiring through the mouth without changing the size or shape of external nares.

b) Mirror test: a double-sided mirror is held between the nose and mouth. Fogging on the nasal side of the mirror indicates nasal breathing while fogging on oral side indicates mouth breathing.

c) Cotton test/Massler's butterfly test: butterfly shaped cotton strand is placed over the upper lip below nostrils. If the cotton flutters down, it is a sign of nasal breathing. This test can be used to determine unilateral nasal blockage.

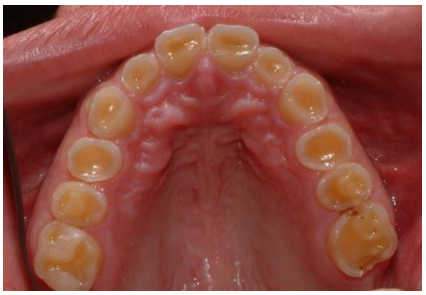
d) Water test: the patient is asked to fill the mouth with water and retain it for a period of time. Mouth breathers find this task difficult.

Management:

- Referral to Otolaryngologists either for medical and/or surgical management of nasopharyngeal obstruction is necessary before any orthodontic treatment.
- Myofunctional therapy or trainers, speech therapist, and oral screen can also used for treatment of mouth breathing**.**
- Mechanotherapy: can be accomplished with either a removable or a fixed appliance.

BRUXISM

It is the term used to indicate the none functional contact of the teeth which may include clenching, grinding and tapping of the teeth. The main etiological factors are occlusion defects and psychological factors. It may cause occlusal wear, sensitivity, teeth mobility, fracture, and TMJ problems.



Management

a) Determine the underlying cause and eliminate it. **b)** Occlusal adjustment including restoration and occlusal splints/bite guards. **c)** Psychotherapy like relaxation exercises. **d)** Drugs like local anesthetic injections into TMJ for muscles, sedatives, and muscle relaxants.

LIP BITING

Lip-sucking may appear by itself or it may be seen with thumb-sucking or as a compensatory activity that results from an excessive overjet and the relative difficulty of closing the lips properly during deglutition. In almost all-instances, it is the lower lip that is involved in sucking and biting, although biting habits of the upper lip are observed as well. When the lower lip is repeatedly held beneath the maxillary anterior teeth, the result is proclination of these teeth, often an openbite, and sometimes retroclination of the mandibular incisors. Sometimes there may be eczematous appearance of the skin below the lower lip.

Management:

- Lip over lip exercises.
- Lip bumper: it could be fixed or removable with labial acrylic pads used to stop lip sucking or biting habits and eliminate the backward pressure of the lower lip on the lower labial dental segment.
- Oral screen.

NAIL BITING HABIT

It is one of the most common habits in children and adults which may be due to emotional and social problems that may affect the psychology of the individual.

Clinical Features: (Crowding**,** Rotation, Attrition of lower or upper incisors, Effect on nails (inflammation of nailbeds and heavily cut nails).

Management:

- No treatment in mild cases.
- Treat the basic emotional factor causing the habit.
- Encourage outdoor activities.
- Reminders like nail polish.

*The essential features of normal swallowing of solid food and saliva are:

- Closure of the lips.
- Teeth in light occlusal contact.
- Tongue elevated to the palate.
- Momentary clenching of the teeth as food passes into the pharynx.