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THUMB SUCKING AND DENTAL CARIES

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ABSTRACT
Thumb sucking habit, a form of non-nutritive sucking, is a repetitive behavior that serves no perceivable social function, but effects the occlusion if persists for a longer period. Thumb sucking not only receives attention from health professionals but often is an area that greatly concerns the parents and family of a child who practice this habit. It is, therefore, most important for the dentist who cares for children to understand this habit well to be able to help the parents and the child relate rationally to it and to manage the child's dental situation.

INTRODUCTION

Putting a finger in the mouth and sucking it is the normal habit of all children that will not leave for many years. Sucking a thumb is a natural reaction in children that may be beneficial or harmful. Sucking a thumb or other fingers and sucking a pacifier or other objects gives a sense of safety or joy to the infants; and helps them to better understand the world around themselves. Behavioral and mood changes, reactions to family differences and lack of affection are the most important factors in sucking fingers in children.

Significant complications such as speech impairment, irregularities in teeth, malocclusion, intra-oral ulcers, and wounds and scars on the thumbs can occur after long sucking of the fingers. With sucking, young children feel more relaxed and fall asleep. Most children leave this harmless habit before the age of two without any worries or interventions but the sucking habit in some children is so severe or repeated that it becomes a dental and social problem.[1]

Some children are only convinced by the dentist after a friendly conversation to put an end to this habit. Recommendations from the dentist may be more effective than parenting advice. If the child is not convinced to leave sucking habits with counsel, use of nightly guards or special protective gear or other habit appliances is recommended, which usually causes the habit to be discarded within a few months.

The reason for sucking fingers in children

Infants have natural sucking reactions that cause the thumb or fingers to enter the mouth. This reaction sometimes begins even before birth. Because the habit of sucking gives the child a sense of safety and comfort, it eventually turns into a habit that a child can relax or fall asleep.[1]

The length of the habit of sucking fingers

Many children leave their sucking fingers in their infancy between the ages of two and four. Those children who still have this habit, by entering school and afraid of being mocked by their peers, leave the sucking fingers. Of course, it should be noted that even those children who have abandoned this habit, they may have a tendency to return to this habit if they are affected by anxiety and worry.[2]

Time to interrupt the habit of sucking fingers

Sucking thumb is not at all alarming until the permanent teeth eruption. But after this period, it affects the roof of the mouth. It also could change the order and arrangement of teeth. Consequently, it causes crowding of the teeth due to space deficiency, and deformation in the palatal area. If the child continues to suck his or her finger vigorously, the teeth will be damaged more than once the child simply places his finger motionless in the mouth.

The most important dental and jaw effects[1-3]

Sucking pacifiers and fingers can seriously damage teeth in long term. Consider the most important issues below:

a. Jaw disorders: There are various sizes and shapes of the pacifier, most of which are not suitable for keeping in the mouth. Therefore, sucking a thumb or pacifier will eventually cause jaw disorders.
b. Dental caries: Many parents try to calm their infants by soaking up the pacifier with honey or other sweet snacks. Oral bacteria feed on sugars and produce harmful acids. These acids attack the tooth enamel and, as result, the teeth of the child develop decay.

c. Palatal narrowing: Oral structures are very flexible in childhood. The long term sucking will lead to narrowing of the palate. Because of the flexible palatal area, it could take the shape of the object which is sucked. The narrowing and deepening of the palatal area, in turn, causes other complications in the growing teeth; For example, teeth disorientation or teeth crowding should be mentioned.[3,4]
d. Malocclusions: In case of sucking thumbs and pacifiers in the long run, growing teeth tend to be tilted, and their appearance does not look so pleasant. Furthermore, it increases the likelihood of the need for orthodontic works.

The most common dental signs associated with sucking non-edible objects include[5-9]

i. Anterior open bite: The incisors teeth of upper and lower jaws are not well placed when closing the mouth
ii. Movement of the Canine teeth: These teeth do not erupt from the correct place. They might erupt buccaly or lingualy. In addition, the pressure of the thumb drives the lower canine teeth back to the mouth.
iii. Maxilla's is narrowing: As a result of the internal pressure on the palatal area by thumbs sucking, as well as, the pressure of the tongue on that area, the Maxilla becomes narrower.
iv. Intruded anterior teeth: Sucking a finger can move the anterior teeth to the forward, which is a common problem. Sucking a finger sometimes affects the formation of the jaw and makes it and teeth stay ahead of the rest of the face.[5-6]
v. Cross Bite: The upper jaw is very narrow to the lower jaw, and therefore the teeth of both jaws are not well aligned. Cross bite is sometimes the result of a change in the muscles cheek when the child is sucking his thumb. Wounding the oral cavity and thumb.

According to Oslon, the most common oral habit was thumb sucking or finger sucking, 1 with a reported incidence ranging from 13% to almost 100% at some time during infancy.[2,3] Foster (1982): The term digit sucking is synonymous with finger sucking or thumb sucking. It is defined as the placement of the thumb or one or more fingers in various depths into the mouth.

Etiology

The etiology of digit sucking has been explained by two theories, which involves emotional and learned behavior theories. The psychoanalytic theory of Sigmund Freud relates finger sucking is the product of pleasure, that child derives from stimulating the oral erogenous zone. Fixation of the habit occurs if the infant sucking needs are not met. Finger sucking at later stage due to other psychological stress is usually considered a sign of regression (redevelopment of a previous habit). Both fixation and regression are the signs of emotional disturbance. 5 The arousal of the sucking habit might be explained through the learning theory and the investigations supporting this theory. There are three factors related to prolongation of the habit. These maintain that prolonged extra nutritional sucking maydevelop from: (1) insufficient satisfaction of the sucking need in infancy (2) emotional disturbances (3) the pleasure derived from sucking.[10]

Management According to Forrestor[11]

(1981), three main areas should be assessed in constructing a treatment plan.

1. Emotional significance of the habit
2. The age of the patient
3. The status of the child's occlusion.

Emotional significance of the habit

Before initiating corrective procedures, it is important to determine whether the thumb- sucking is a meaningful or an "empty" habit. One should treat the meaningful habit with the psychological approach and the empty habit with the dental approach. Consultation with a psychiatrist is considered if the sucking habit is a symptom of an abnormal behavior problem.[12]

Treatment of An Infant (Birth To 2 Years)

Thumb sucking during infancy is of no concern to the dentist or the parent if no physical effect is produced on the teeth. When sucking is abnormally vigorous enough to displace the teeth, the problem is of concern and also could act as a symptom of:

1. Insufficient feeding
2. Inadequate love
3. Bored, unhappy, or over the fatigued child.

No attempt should be made to cure the habit in a malnourished or sick infant who may obtain significant emotional gratification from it. Frequently, the only treatment necessary may be a little more cuddling and playing with the child and simple instruction to the mother in the technique of feeding the infant.[12]

Treatment in A Preschool Child (2½-3 Years)

At these years, child begins to assert his/her independence from the mother and inevitably tensions and frustrations may occur causing an occasional short-lived sucking episode. In the preschool child, thumb sucking which is practiced only before going to bed may be disregarded being a benign activity, and correction may prove harmful. However, if it is frequently indulged during the waking hours, the child is over fatigued bored or unhappy, then suitable factors in the environment should be corrected. A child should have ample play facilities and an adequate amount of self-expression.[12]

Treatment in 3-7 Years Old

This age group child may be more of a concern depending on the type of habit and whether the child is pulling the maxilla anteriorly or just sucking his digit with buccal constriction. The child with good molar

intercuspation and little anterior pull, i.e., the passive sucking child should be counseled, and the dentist should work along with the parent with contingent behavior modifications.[12]

Treatment In Children Older Than 7 Years

These children are mainly characterized by anterior open bite that will usually not close by itself due to functional patterns that have been established. These children will all require some form of active orthodontic treatment.12 Techniques for Habit Cessation.[5]

Habit Awareness

Habit reversal therapy is commonly used in repetitive, body focused behavior disorders that cause significant functional impairment. It involves training the individual to recognize the behaviors preceding digit sucking, together with situations where it occurs. It also aids in teaching the individual about alternative responses to the habit behavior.[13]

Covert Sensitization

Covert sensitization is a procedure in which a cognitive-induced aversive response is paired with the habit. An imaginary picture of the activity to be eliminated is evoked and then accompanied by a mental image of an aversive response like nausea (Daniel-1974).

Contingency Contracting

Punishment using the time out from positive reinforcementA contract of reward or punishment is made contingent on habit cessation or the lack of habit cessation, reward, respectively (Friman, 1987). Contingent reading has also been used to treat nighttime thumb sucking.[14]

Prevention of Covarying Response

Researchers suggest that individuals having a habit behavior are likely to have more than one habit. Covariation among habits suggests that behaviors with disparate topographies may be part of the same response class (maintained by the same reinforcing consequences) or part of a response chain. When thumb sucking covaries with another repetitive behavior, an effective treatment of one behavior may cause successful elimination of other behavior also. Direct covariation between the two behavioral covariation researches is the exploitation of successful treatment of the other.[15]

INTRA ORAL APPLIANCE

Palatal bar

The palatal bar is one of the principal habit reminders. It consists of a 0.030 inch round lingual arch wire attached to the upper first molar bands with an anterior platform, which clears the palate by about 1/8 inch. This keeps the thumb or finger from exerting pressure on the soft tissue of the palate. The seal is broken, there is no suction, and the pleasure of thumb-sucking is destroyed. An occlusal rest on the occlusal surface of the upper first premolars prevents the palatal bar from settling into the soft tissue. The bar must be so designed that it will not prevent the teeth from closing normally.[16]

Palatal arch

Bands are placed on either the maxillary second deciduous molars or the first permanent molars. The palatal arch is made from 0.040-inch stainless steel wire and is similar in design to the palatal crib, except that it does not have a vertical fence like portion.[16]

Palatal crib

Habit retraining appliance, which utilizes a blunt wire "reminder" which may prevent the child from indulging in the habit. The crib consists of a wire embedded in removable acrylic appliance similar to a Hawley retainer, or it may be a "fence" added to an upper palatal arch and used as fixed appliance.

Blue grass

Appliance consists of a six-sided roller made of Teflon which is constructed over a 0.045 stainless steel wire which is soldered to bands placed on either the maxillary

first molars or on the primary second molars. The roller is placed in the most superior aspect of the palate and must not be in contact with the palatal tissue so that patients can roll them with their tongues. This device works through a counter conditioning response to the original conditioned stimulus for thumb sucking. This appliance is placed for 3-6 months and in early or mixed dentition period it is indicated.[18]

Baker[19] modified blue grass appliance with 4 mm acrylic beads, multiple rollers and thus expanding its use from primary to permanent dentition. The advantage of the new design is that it encourages maximum neuromuscular stimulation by using two or more beads, according to the principles of Castillo-Morales. One to four beads are placed on the cross palatal wire, depending on the amount of space available as shown in the Figure 6a and b. Haskell and Mink recommended to leave the bluegrass in the mouth for 6 months after the habit has stopped. Earlier removal has resulted in the reappearance of the habit.

Quad helix

The quad helix is a fixed appliance used to expand the constricted maxillary arch. The helixes of the appliance serve as a reminder to the child not to place the finger in the mouth. The disadvantages of intraoral appliances include a period of emotional upset until they get used to the appliance, speech being affected temporarily and difficulty in eating.[20] (Haryett et al., 1970). With the use of fixed orthodontic habit breakers increased tendency for caries and decalcification of enamel surfaces, gingival inflammation may occur.

CONCLUSION

Sucking is quite instinctive in infants. This behavior is natural and normal for young children. However, if after 6 years of age, the baby is still sucking, he needs treatment. Continuing this behavior causes complications in the teeth, gums, and jaws. In addition, it can cause verbal failure, chewing disorders, speech disorders, and ulceration of the oral area and fingers. The continuation of this habit is due to a psychiatric problem in a child who is unable to control his anxiety. It should be noted that the higher the age, the greater the likelihood of leaving this habit. The origin of this child's behavior should be discovered. In the end, the use of special orthodontic appliances by dentists is suggested to overcome this problem.

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