RURS' ELBOW GUARD: A STATE-OF-THE-ART TREATMENT OF DIGIT SUCKING HABIT IN A CHILD WITH PRIMARY DENTITION

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ABSTARCT

Digit sucking habit is a learned pattern of behavior commonly seen in children of preschool age. Prolonged digit sucking beyond the preschool age, lead to the development of malocclusion such as anterior open bite, maxillary constriction and posterior crossbite. This habit can also have a negative impact on speech, psychology and dental development of the child. This article presents a case report of a 5 year old child with digit sucking habit. A new appliance, i.e. RURS'Elbow Guard was fabricated which was successfully used to break the habit.

Keywords:

Digit sucking /Thumb sucking habit, Dento-facial malformations, RURS'Elbow Guard

Introduction

Sucking is a physiologic act that is involuntarily performed by a fetus, which becomes a fully developed reflex at birth. It acts as a source of nourishment to the baby and provides comfort. It means sucking can be either nutritive or non-nutritive. Non-nutritive sucking is probably the earliest sucking habit adopted by infants in response to frustration and to satisfy their urge and need for contact.

An adequate balance between external (lips and cheeks) and internal (tongue) muscle forces are required for the development of a normal occlusion[1].

Thumb or digit sucking can be defined as placement of the thumb at various depths into the mouth. It is considered to be the most prevalent of oral habits, ranges from 13% to 100% at the time of infancy. The prevalence of digit habits decreases with age, by 3.5 to 4 years but some may continue into adulthood[2].

Thumb sucking habit based on the clinical observation can be normal or abnormal. It is considered normal during first and second year of life and does not generate any malocclusion. But if the habit persists beyond the preschool period then it is considered as abnormal and results in deleterious effects on the dentofacial structures. Abnormal Thumb sucking habit can be further divided into psychological if the habit has a deep-rooted emotional factor involved and habitual if the child performs the act out of habit without any psychological bearing.[3]

Clinical Aspects of Thumb Sucking (Moyers)[4]

Phase	Clinical Stage	Age of the child	Inference
Phase 1	Normal /Subclinically significant sucking	Pre-school infant	Display particularly at the time of weaning
Phase 2	Clinically significant	Grade school (3-6 yrs)	The presence of sucking is an indication that the child is under great anxiety. Treatment should be initiated during this phase.
Phase 3	Intractable sucking	Teenage child	Habit persisting beyond 4 and 5 year of life should alert the dentist to the psychological aspect of approach

A study was conducted by **Franco Varas V, Gorritxo Gil B (2011)** showed a significant increase in malocclusion in the primary dentition of children who prolonged the habit of digit sucking. Early abandonment of the habit results in improved anterior open bites, while posterior cross bites clutch remained or ever got worse. It can cause undesirable effects on the dentition and even affect the bone of the anterior part of the mandible and deform the maxillary arch or palate or both. There is a strong agreement that the digit sucking habits that persist while permanent teeth erupt can have detrimental effects on the dentofacial development. These effects are usually temporary, provided the sucking habits are discontinued before 6 year of age. If the habit is discontinued after 6 year of age, such children invariably have malocclusion at 12 years of age[5].

The effects of these habits on the development of the dentofacial structures depend on various factors. These are[6]:

- The frequency of the habit
- Duration of the habit
- Intensity of the sucking
- Relationship of the dental arches
- Childs physical health
- Direction and nature of force excreted by the digit.

Because prolonged finger sucking may cause permanent damage to the digits, necessitating corrective surgery, the habit should be broken at an earlier age, before finger deformity or malocclusion have had time to develop[7]. Once the decision for treatment has been made, one must then determine what intervention is appropriate.

The levels of treatment possibilities that are usually considered are[8]:

1. Age appropriate explanations to the child
2. Positive reinforcement
3. Digital reminders:

- Chemical means
- Mechanical means: Adhesive tape to the thumb or finger

4. Appliance therapy

- Removable or Fixed Palatal crib
- Hay Rakes
- Oral screen
- Lingual arch appliance
- Blue grass appliance
- Modified Blue grass appliance
- Soldered W arch
- Quad helix

This article presents a case report of a child with primary dentition along with thumb sucking habit. The child practices the habit particularly during sleep and do not have severe dental malformations. In order to resist the child from practicing the habit, a unique appliance developed by **Shetty RM et al (2010)** termed as "RURS' elbow guard," was successfully used[9].

CASE REPORT

A 5 year old child accompanied by his mother reported to the clinic with a chief complaint of digit sucking during sleep only. Parents reported history of active digit sucking by the child since childhood. Child's mother revealed that he was unable to refrain from the habit even after repeated motivation from them.

Extra oral examination revealed exceptionally clean, chapped and with a short fingernail, i.e. a clean dishpan thumb. Roughened callus was present on the superior aspect of the middle finger. Lips were competent both at rest and during swallowing. Patient had apparently symmetrical face with a straight profile and mesomorphic facial pattern. Intraoral examination revealed normal size shape and position of tongue. Mesial step molar relation was present and interdental and primate spaces were absent **(Figure 1a, 1b and 1c).**

The child was counselled in the same visit regarding the deleterious effect of digit-sucking habit on dental occlusion, facial esthetics and he was self-motivated to stop the habit by himself. However, he expressed inability to refrain from the habit. Then it was decided to place an elbow guard to stop the habit as it restricted the thumb from reaching the mouth. An orthopedic surgeon was also consulted before starting the procedure.

APPLIANCE DESIGN

An impression of the elbow (45-60 degree) with impression compound was made and a cast was obtained (Figure 2). Two layers of modelling wax were adapted to the cast, which acted as a spacer (Figure 3). Acrylization was performed using self-cure acrylic. The spacer was removed (Figure 4) and was replaced by a layer of sponge for cushioning and to allow limited movements of the elbow (Figure 5). A cover with velcro strap was stitched over the acrylic elbow guard (Figure 6). This state-of-the-art appliance was termed as "RURS' elbow guard" and was delivered to the patient. It allowed some movement of the elbow but it did not allow the thumb to reach the mouth (Figure 7). The patient was comfortable with the RURS' elbow guard.

DISCUSSION

Children with digit sucking habit are routinely managed by age appropriate explanation, positive reinforcement, digital reminders and intra oral appliance therapy. Some of these treatment modalities have reported limitations and disadvantages.

Literature and clinical experiences revealed that a bitter and sour solution like quinine, asafetida, pepper, castor oil, etc. usually has a limited effect. New anti-thumb sucking solutions like femite, thumb-up, anti-thumb are also being marketed but they also showed moderate success[10].

Adhesive tape application carries the risk of reducing blood circulation and reported to cause infection or sweating[11]. Although long sleeve night gown makes it difficult for the child to suck but at the same time it increases the child's frustration and wakefulness[12]. Appliance therapy also has certain limitations. Fixed Habit breaking appliance results in decalcification of enamel makes the child prone for caries and gingival inflammation. The success of treatment by removable appliances depends on patient cooperation. It also affects the speech and pronunciation[13].

In the present case, an acrylic elbow guard was planned instead of using an intraoral habit breaker because the patient was not having any severe dental malformation and the habit was present during sleep only. So an attempt was made to try this unique appliance on a healthy child along with age appropriate explanations. The child perceived it something like a wrist band and fashionable therefore, he did not try to

remove it. The patient abandoned the habit in a short time as the appliance prevented the pleasure of sucking and, did not begin to suck or bite the thumb or finger of the other hand.

RURS' elbow guard has some advantages over fixed and removable appliance[9]:

1. Does not create difficulties during speech and chewing
2. Easier to make an impression of the elbow compared to the teeth.
3. Preparation is easy, simple and economic.
4. Does not affect the oral hygiene negatively.

CONCLUSION

RURS' elbow guard described in the present case is easier to fabricate and economical. It did act as a habit deterrent and proved to be successful in healthy patients. Further studies on a sufficient number of healthy or mentally retarded children are required to evaluate the short and long-term effects of the presented method.

Case Report Pictures

Figure1a: Frontal view

Figure 1b: Absence of interdental spaces

Figure 1c: Callus formation on middle finger

Figure 2: Impression making of the elbow using impression compound

Figure 3: Two layers of modelling wax as a spacer

Figure 4: Acrylic elbow guard after removal of spacer

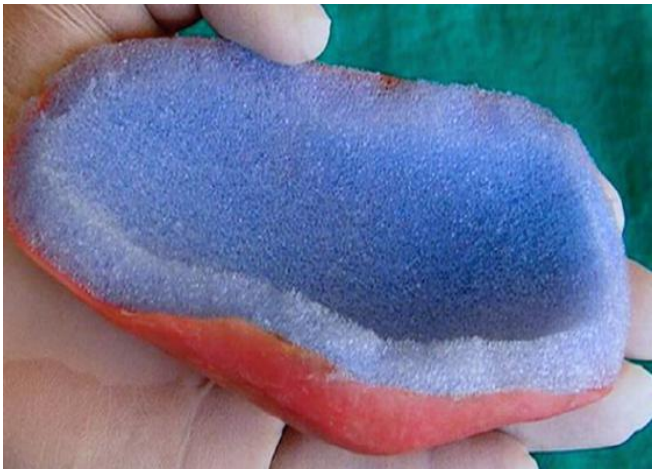

Figure 5: Acrylic elbow guard after placemen of a layer of sponge

Figure6: RURS' elbow guard tried on the cast Figure7: RURS' elbow guard allowing the movement of the elbow but restricting the thumb from reaching the mouth

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