An Innovative Fixed Habit Breaking Twin Appliance For Thumb Sucking: a Case Report

Shital Kiran D.P, Hetal Majeethia, Vinay Mulchandani, Shalin Shah

Department of Pediatrics and Preventive Dentistry, College of Dental Science and Hospital, Amargadh, Bhavnagar, India.

Abstract

Oral habits have been considered as risible behaviour for infants to gather information from the environment and can lead to malocclusion. Malocclusion may result in esthetic deterioration and functional disorders such as bad speech, chewing and swallowing, with a negative impact on quality of life. Digit sucking is a natural phenomenon and is one of the most common learned patterns of behaviour seen in children of preschool age. If digit sucking habit persists beyond the time permanent teeth begin to erupt, it may cause malocclusion. Chronic prolonged habit may cause harmful effects on dentofacial structures. Reminder therapy using blue grass appliance has been proven successful to intercept thumb sucking habit. The present case report describes an innovative fixed habit breaking twin appliance is designed to terminate thumb sucking and tongue thrusting habit.

Keywords: Habit, Thumb sucking, tongue thrusting, Remainder therapy, Blue grass appliance.

Introduction

Finger and thumb sucking are common in infancy and early childhood and, in the most of cases, is impulsively discontinued by about 5 years of age. In a minority of cases, however, the habit may continue for several more years, even into adolescence and beyond. Digit sucking can lead to an asymmetrical anterior open bite which is worst on the side that the digit is sucked. Not all digit suckers develop anterior open bite, the important factors being the time span and frequency of the habit. Those who suck for more than 6 hours a day often develop remarkable malocclusions.[1] The etiological factors responsible in the initiation of non-nutritive sucking habits and recommended some situations that may stimulate digit sucking habits including; hunger, boredom, excitement, fear, fatigue, physical, emotional stress and insufficient satisfaction of sucking need in infancy[2].

Thumb sucking is of two types:

Active: In this type, there is a heavy force by the muscles during the sucking and if this habit continues for a long period, the position of permanent teeth and the shape of mandible will be affected.

Passive: In this type, the child puts his/her finger in mouth, but because there is no force on teeth and mandible and hence this habit is not associated with skeletal changes.[3]

A secondary tongue thrust develops leading to the exaggeration of the condition. The forward movement of the tongue between the anterior teeth during speech may be observed. Finally, a forward positioning of the tongue with the tip of the tongue positioned between or against the anterior teeth at rest.[4] The negative effect of digit-sucking habit can be seen in the form of proclined and flared maxillary and/or mandibular incisors, development of anterior open bite, and Class II malocclusion.

APPLIANCE DESIGN

Clinicians modify and design their own appliances for the cessation of digit sucking habit. Haskell and Mink introduced the Bluegrass appliance in 1991 to stop thumb sucking in children. It uses a hexagonal Teflon roller on a cross–palatal wire. In keeping with the principles of positive reinforcement.

The idea came from the equine industry where a bit with copper rollers is used to distract irritable horses. This works through the counter conditioning response to the

original conditioned stimulus for thumb sucking.[5]

We report a novel treatment for the thumb sucking habit using a fixed habit breaking twin appliance designed using a two medium size beads and an additional tongue crib. Medium size beads and tongue crib was chosen as the patient had secondary adaptive tongue thrusting habit in addition to thumb sucking as only beads might not refrain tongue thrusting.

CASE PRESENTATION

A 13-year-old boy accompanied by his father reported to the Department of Pediatrics and Preventive Dentistry, College of dental science and hospital Amargadh. with a chief complaint of space between upper and lower front teeth (Fig 1). A detailed history was recorded in which, father revealed that the child was having digit sucking habit regularly for 8-9 hrs/day for 10-12 years. On examination callous formation was seen over right thumb (Fig 2). As duration and intensity of digit sucking was intense, the child presented with anterior open bite with secondary tongue thrusting and was in mixed dentition stage.

Bluegrass appliance was planned with modification which was done with beads and palatal crib as the patient had a thumb sucking and secondary tongue thrusting habit.

Fig :1 ANTERIOR OPEN BITE

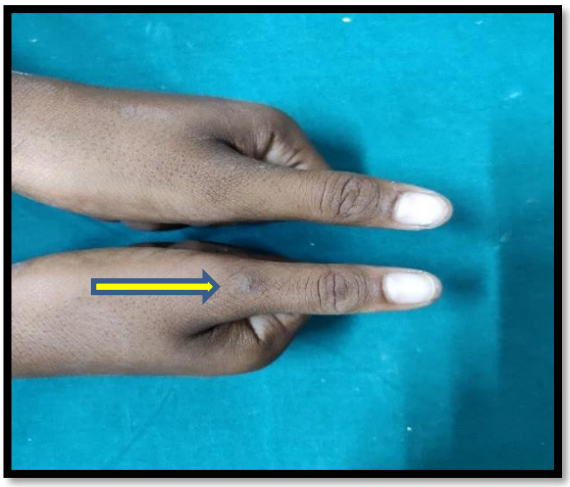

Fig 2: CALLOUS ON THE RIGHT THUMB OBSERVED

Accordingly, the maxillary first molars were banded (Fig 3), and alginate impression was made and band stabilization was done (Fig 4).

Fig 3: BANDING ON RIGHT AND LEFT MAXILLARY 1ST MOLAR

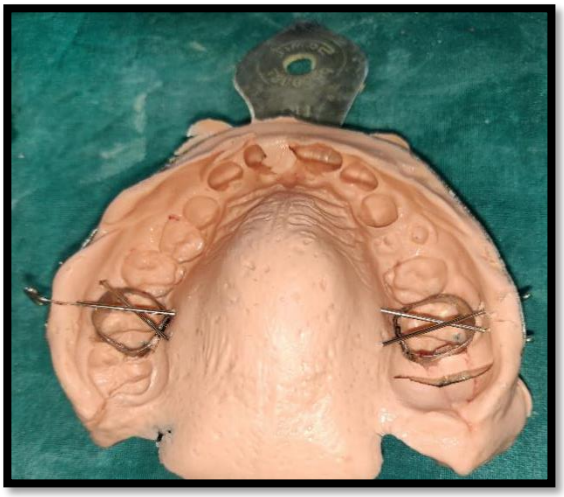

Fig 4: ALGINATE IMPRESSION AND BAND STABILIZATION

The crib and horizontal palatal bar for beads was fabricated on the cast using a 0.8 mm stainless steel wire over the palate extending from the permanent maxillary 1st molar on either side (Fig 5). The crib was soldered to the band adapted on the permanent maxillary 1st molars. Plastic medium size two Beads were inserted into the horizontal palatal bar it was stabilized and beads was covered on the cast with plaster to protect it from the heat then horizontal palatal bar was soldered to the middle third of a crib (Fig 6). An additional benefit of plastic beads is the availability of various size and colours for the selection and time saver in compare to customized roller.

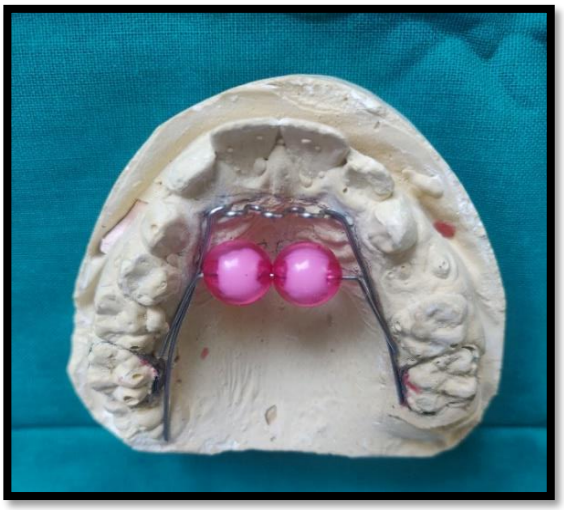

Fig 5: PRE - FABRICATION PLACMENT OF COMPONENTS.

Fig 6: Fixed habit breaking twin appliance

Appliance was cemented with type I Glass ionomer cement. (Fig 7)

Fig 7: POST CEMENTATION OF APPLIANCE

post cementation instruction given. The child was instructed to roll the bead with his tongue whenever he felt like sucking her thumb. The father reported the cessation of the habit on the very first week. And periodic follow-up were taken. After complete cessation of thumb sucking habit, appliance was removed at 4 months where reduced anterior open bite was reported (Fig 8).

Fig 8: Reduced anterior open bite after de-cementation of appliance .

DISCUSSON

Oral habits and malocclusion have a high frequency in children. They hamper the normal development of dental and skeletal growth.[6] Thumb sucking generally include placing the thumb into the mouth and rhythmically repeating sucking contact for a prolonged duration and is considered to be relaxing and beneficial for the person. Tongue thrusting habit is defined as a human behavioural pattern in which the tongue protrudes through the anterior teeth

during the swallowing pattern, speech, and rest.[7] Thumb and Finger sucking is common in infancy and early childhood and, in the majority of cases, is impulsively break off by about 5 years of age.[1]

Theories that endeavour to explain this trend suggest that children who are naturally breast-fed satisfy their sucking needs and thus have less need to suck a digit, pacifier or other object.[1]

There are various habit breaking oral appliance that are used as reminders to the child to break the habit. A fixed appliance is always preferred to are movable appliance due to its higher compliance. Appliance is custom fabricated after placing bands on either the first permanent molars or primary second molars and making an impression. Fabricated appliance is then cemented and kept in the mouth 5-6 months after the habit is broken. Following oral appliances are successfully used to treat digit sucking habit.[3] However, emotional disturbances, difficulty in speech and eating, and iatrogenically self-inflicted wounds can occur with such appliances.[8]

Limb rock [9] have suggested the appliance design even for toddler group to 12-year-old child. Cessation of habit was reported on very 1st day in toddlers, whereas it takes few weeks in case of 10–12-year old children. Hence, in early mixed detention or even in younger group, appliance could be used comfortably. If habit persists for longer time exhibiting posterior cross bite, modified bluegrass appliance can be given with Quad Helix to expand arch. Hence, two stage treatments can be completed with single appliance with correction of habit.[8]

CONCLUSION

This case represents the use of a fixed habit braking twin appliance which is a modification of blue grass appliance with 2 beads and crib as a positive reinforcing approach to correct the thumb sucking and secondary tongue thrusting habit. When the patient played with the beads it created a new habit, thus breaking the old one and holding true for the adage “the proper way to eliminate bad habits is to replace them with good ones.”

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Corresponding Author:
Dr. Hetal Majeethia
Department of Pediatrics and Preventive Dentistry, College of Dental Science and Hospital, Amargadh, Bhavnagar, Gujarat, India.
Email ID: hetalmajeethia@gmail.com