Introduction

Thumb sucking has been described as a common childhood behavior, manifestation, or habit that is considered normal up to the age of 3-4 years [Greenleaf and Mink, 2003]. It is defined as the placement of the thumb in varying depths into the mouth [Marwah, 2009].

Prevalence of thumb sucking habit was found to be 14% in children 6 years old, and 6% in children 11 years old [Greenleaf and Mink, 2003].

Two methods of "reminder therapy" technique are often used in children to cease thumb sucking habit: response prevention and appliance therapy (fixed or removable) [Polyakov, 2002].

Here we present two cases of thumb sucking habit in a 7 and a 10 year old children, corrected by non-punitive reminder therapy using customised Bluegrass appliance.

Case reports

Case 1

A 7 year old child accompanied by his mother reported to our department with a chief complaint of thumb sucking habit. Detailed history elicited from his mother revealed that he used to suck his thumb when he was bored and while sleeping.

Intraoral examination revealed an anterior open bite. Treatment of thumb sucking habit was initiated on the first visit, by counseling the parent and the child regarding the adverse effects of thumb sucking on the developing dentition. By the second visit the child was willing to undergo treatment, so we planned a non-punitive reminder therapy using a customised Bluegrass appliance, which was fabricated by adapting 0.9 mm stainless steel wire over the palate extending from the first permanent molars on either side. A green color acrylic bead was inserted into the stainless steel wire and soldered to the bands adapted to the first permanent molars (Fig. 1).

We had customized this appliance by adding 'U' bends on either side of the bead unlike the conventional type. The appliance was cemented using type I glass ionomer cement. The patient was instructed to roll the bead with his tongue, whenever he felt like sucking his thumb.

Recall checkups were scheduled every 2 months. The child was very comfortable with the appliance and played by rolling the beads with the tongue. By the end of the fourth month the patient had discontinued the habit, but the appliance was left in place for 6 months after correction to avoid relapse.

At the 1 year recall checkup the child showed no relapse of the habit.

Case 2

A patient aged 10 years reported to our department accompanied by his mother with the chief complaint of thumb sucking habit. Detailed history elicited from his mother revealed that he used to suck his whole thumb while watching television and sometimes even during school hours. His mother tried stopping the habit by applying bitter substance over his thumb, which was unsuccessful.

Intraoral examination revealed slight proclination of upper anterior teeth.

The appliance was modified by providing additional bends in the form of loops on either side of the bead (Fig. 2). The patient was kept under observation and recalled every 3 months for checkup. By the end of 6 months the patient had discontinued the habit.

Discussion

The decision for the dentist to utilize an oral appliance should be done after consultation with the parents of the child [Greenleaf and Mink, 2003]. If an appliance is used it should not be painful or interfere with occlusion; instead it should merely act as a reminder [Dean et al., 2004]. Haskell and Mink [1991] introduced the Bluegrass appliance as a positive reinforcement to stop thumb sucking in children. They reported that all the 24 patients
(7-13 years) treated with Bluegrass appliance in the mixed dentition were successful. A retrospective study of the use of Bluegrass appliance in the cessation of thumb sucking habit was found to be effective in 28 out of 30 subjects [Greenleaf and Mink, 2003].

Modified Bluegrass appliance utilizing 4 mm double acrylic beads encouraged higher neuromuscular stimulation than the hexagonal Teflon roller of the conventional type [Baker, 2000]. Another modification was in the wire component of the appliance being soldered to the stainless steel crown, which was found to be successful in intercepting digit sucking habit within a short period of time [Neeraja et al., 2009].

The effect of the sucking habit on the maxillary and mandibular bones and on the dental arches, including the occlusion of the teeth, depends on several factors. These include the frequency with which the habit is practiced, the duration of the habit, the osteogenic development, the genetic endowment and the child's state of health [Dean et al., 2004]. In both our cases, duration and frequency of the habit were not intense. The child and parent were willing to undergo treatment to intercept the habit. The bead color was selected based on their preference.

Diagnosis of anterior open bite should be made only when all the permanent incisors are fully erupted so case 1 was considered as pseudo open bite. During appliance fabrication, we made ‘U’ shaped bends on either side of the bead. In case 2, we had added bends in the form of loops in the wire component on either side of the bead. In contrast to the bulkier bead used in conventional and modified Bluegrass appliances we used small sized single bead along with modification in the wire component, such that it prevents sideward displacement of the bead and also enhances the stability of the appliance. Both these customised Bluegrass appliance were successful in intercepting the thumb sucking habit with limited complication in our patients. Long term follow-up is required to evaluate the effect of this appliance on dental arches and teeth.

Conclusion

Customised Bluegrass appliances were successful in intercepting the thumb sucking habit, by overcoming the problem encountered with the conventional type appliance.

References