A clear, fixed pressure-formed, habit breaking appliance

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Introduction

Digit sucking habit, usually referred to as thumb or finger sucking habit, can cause adverse effect on normal pattern and direction of tooth and dentoalveolar growth. During thumb sucking, due to lowered position of the tongue in the oral cavity, maxilla tends to grow in an abnormal protrusive direction with the mandible growing in downward and backward direction. It causes maxillary anterior teeth protrusion while mandibular teeth are retroclined. The lowered position of tongue as well as the increased cheek pressure may also result in postterous cross bite.

Moyers has concluded, that the thumb sucking habit creates undue pressure on immature highly malleable alveolar ridge, and can lead to malposition of the teeth, aberrant breathing pattern, speech abnormalities, facial muscular imbalances, and psychological problems.

Graober, in his classic work, states that the muscle activity is normal in Class I malocclusion except in case of Class I malocclusion with the anterior open bite. The most common cause of anterior open-bite problems is thumb or finger sucking habit. It is considered normal for children to engage in non-nutritive sucking during infancy which mostly disappears spontaneously by 6-18 months of age.

Profit states that most of the dental changes resolve if sucking habit is discontinued before eruption of the permanent teeth erupt. In cases of persistent thumb sucking habit with sufficient intensity, frequency and duration, maxillary anterior segment is deformed leading to adaptive forward thrust of tongue, which accentuates open bite, preventing adequate eruption of maxillary incisors and forcing them labially.

When maxillary incisors move labially, lip enters to in picture and joins the tongue in nature’s adaptive attempt to create oral seal during swallowing. Open bite is accentuated by this vicious cycle unless normal activity is restored and mature somatic pattern is achieved (Fig. 1).

Habit breaking appliances make thumb sucking meaningless by breaking suction, preventing displacement of incisors and repositioning the tongue. Habit breaking appliances, generally, have an associated problem of compliance wear, especially with the commonly used removable crib with little success.

Haskell and Mink introduced Blue-grass appliance having hexagonal teflon roller on the cross-palatal bar. Chris Baker modified Blue-grass appliance by replacing roller with two acrylic beads claiming more stimulation of tongue. All these modifications required some wire bending skills, with soldering procedures in some designs for cross-palatal bar-bearing cribs, spikes, beads or rollers, but without any passive guidance elements for labially deflected or erupted incisors.

This article introduces a new clear, fixed pressure-formed habit breaking appliance, which is easy to fabricate and is clear, for early patient acceptance, & overcomes non-compliance associated with removable appliances with passive eruption guidance to incisors.

Appliance design and fabrication

1. Patient’s molar bands with soldered buccal and lingual buttons, on a working cast (Fig. 2). Button soldered to provide retention of molar bands into pressure-formed sheet.
2. The cast was scored with three deep bur holes along the line joining cuspid tips on the rugae area (Fig. 5).
3. Orthodontic white stone was used to create spikes with stone flowing and anchoring into retention holes on cast (Fig. 4).
4. Wax relief was given along erupting incisor path (Fig. 5).
5. Working model in MiniStar R unit* & DuranR** pressure moulding foil were used to form the appliance (Fig. 6).
6. Labial view of the appliance (Fig. 7).
7. Inside view of the appliance with sheet cut out over molar band’s occlusal surface, ready to be cemented in patients mouth (Fig. 8).
8. The spikes of pressure-formed appliance can be filled with wax, cement, or colored acrylic to provide additional rigidity.
9. Wax relief over erupting incisors can progressively be removed (Fig. 9).

To provide guidance, the appliance can be cut back on lingual aspect of incisors, with a flowable composite flown into labial, for applying pressure on erupting incisors to be guided lingually.

Discussion

Graober mentioned fashion flourish in orthodontics as they do in interior decorating and clothes designing, with time-linked subject orientation. Current popularity of pressure-formed appliances, after Sheridan’s thermo-formed appliances for corrective orthodontics and retention purposes, have encouraged development of appliances which are easy to fabricate with no wire parts, and are less costly. Clear and transparent appearance of these appliances promote early patient acceptance especially in the prepubertal children with low ego strength.

The thumb sucking habit, leading to open bite malocclusion is, generally, the first assault on the integrity of dentition and the adaptive and compensatory activities of tongue and lip, which later may team-up to provide a more significant deforming mechanism. Thus, it is essential that an interceptive appliance is provided to eliminate thumb sucking habit before arch is deformed sufficiently, to require homoeostatic muscle action during deglutition.

References available on request.

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