



Effectiveness of Mandibular Lip Bumper therapy in mixed dentition patients- A review of literature

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Abstract

The aim of this study is to evaluate the clinical effects of Lip Bumper therapy on the mandibular arch in mixed dentition patients. The main objectives of this appliance are the reduction of anterior mandibular crowding, the distalization of the first permanent molars and the increase of arch width, depth and circumference. Many authors consider Lip Bumper a functional device capable of altering the equilibrium between the tongue and lip and cheek pressure determining dentoalveolar widening and dental alignment.

Introduction

Lip bumper is an orthodontic device that plays a fundamental role in the increasing arch width and in maintaining leeway space (1,2). Depending on facial balance, different therapeutic strategies have been used by orthodontists to resolve dental crowding, for example expansion, tooth extraction, reduction of dental dimensions (3). The ability of Lip Bumper to develop the lower arch makes it an excellent non extractive therapeutic modalities in case of moderate lower anterior crowding. This device produces a mandibular expansion both in anterior-posterior and transverse direction.

Mandibular lip bumper consists of a stainless steel wire with a diameter of 1,1 mm, inserted into lower molar bands, usually first permanent molars. This appliance is characterized by two adjustment loops, just mesial to the tubes of molar bands. The loops can be shaped to allow transverse, anterior-posterior or vertical activations. Activation of the loop produce the progressive advancement of the labial portion (4). The wire is generally covered anteriorly with plastic or acrylic and must be a few millimeters away from the buccal surface of the lower teeth. The active forces are not produced directly by the appliance but by the thrust of the tongue that causes the vestibularization of anterior teeth. The Lip Bumper inhibits the pressure of the perioral musculature, keeps the lower lip away from the anterior dental group and transmits it to the posterior group, distalizing the molars (3). Å

Methods

Our review was conducted using the electronic literature database Pubmed. The period considered was from 1991 to 2014. We used specific keywords : lip bumper appliance, functional therapy, dental crowding, second molars impacted, arch width.

Discussion

Studies of literature have evidenced different Å therapeutic effects of Lip Bumper appliance included increase in arch width, particularly in premolar and molar regions, and an increase in arch depth associated with proclination of incisors and distal tipping of molars (5,6).

A lot of article demonstrated a statistically significant increase in arch width at the canine, premolar and molar regions (3,4,7). Solomon et al found the greater expansion at the level of premolars and the least at the canines (8). Several studies showed a significant improvement of anterior dental crowding in patients treated with lip bumper appliance. According to Scott and others the reduction of incisor irregularity probably derives from the combination of two factors (7): the increase of intercanine width which allows better alignment of the mandibular incisors and the reduction of lower lip pressure that determines the proclination of incisors, increasing arch width in this region. Infact several studies reported a significant increase of the incisor mandibular plane angle (IMPA) after Lip Bumper treatment (9).

Many authors have focused on changing the position of the mandibular first molar with lip bumper therapy. Statistically significant results were achieved both for the mesiodistal repositioning and for the change in axial inclination of first molar. The cephalometric analysis of Scott et al revealed that the molar underwent uprighting and did not move bodily (7).

However, the use of Lip Bumper often worries orthodontists because this appliance is associated with a potential eruption disturbance of the second permanent molars. Some authors sustained that especially devices with thick acrylic shields from canine to canine could hinder the physiological

eruption of second molars following the distal tipping of the first molars (1.5). Ferro and other authors showed that patients undergoing lip bumper therapy are more likely to incur in ectopic eruption or non-eruption of second molars than untreated subjects (10). In addition, patients treated with Lip Bumper typically have anterior mandibular crowding and Evans and other authors found a correlation between dental crowding and eruption disturbance of second molars (11). Despite the lip bumper increases the risk of a second molar impaction, Jacob et al. sustained that this condition can be easily treated with spacers (12)

Several authors have focused not only in lip bumper results but they evaluated also the long term stability of lip bumper therapy followed by fixed appliances. Solomon and other authors found that lip bumper therapy along with fixed appliances is an excellent therapeutic strategy to maintain long-term increases in arch width (8).

Some studies showed the effectiveness of the lip bumper in eliminating the lower lip sucking habit (13). The device can correct the occlusal and functional altered relations due to the vitiated habit and can restore an adequate facial esthetics.

Conclusion(s)

Lip bumper therapy has been shown to successfully increase the mandibular arch length trough proclination of the incisors and uprighting of the first molars. The literature has shown the stability of the clinical results obtained in patients treated with Lip Bumper. If the desired objectives are achieved this device can simplify the banded phase of treatment and decrease the need for extracting permanent teeth.

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