



SECOND MOLAR IMPACTION WITH LIP BUMPER THERAPY

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Abstract

Mandibular lip bumpers (LBs) can provide significant clinical gain of mandibular arch perimeter during mixed-dentition. However many orthodontists do not use them due to the possibility of permanent second molar (M2) eruptive disturbances.

Introduction

Overcrowding is a very common clinical findings in orthodontic patients and is measured by TSALD (tooth size-arch length discrepancy). Approximately 31% of North American adolescents have more than 4 mm mandibular irregularity and 40% of adults have irregularities greater than 3.5 mm. Depending on severity of crowding and patient's profile there are different therapeutic options: extractions, reducing tooth mass and increasing arch size. For mild to borderline moderate TSALD lip bumpers are commonly used. This appliance can provide an effective and relatively stable treatment approach, by maintaining lee way space and increasing arch width. LBs are inserted into buccal tubes bonded to first permanent molars (M1), maintained in front of and away from lower anterior teeth and activated by lower lip pressure. In particular way the appliance keeps lower lip and buccal musculature away from mandibular teeth. Its effects are an increase in arch width, especially in premolar and molars region, and in arch depth associated with proclination of incisors and distal tipping of molars (M1), which could prevent normal eruption of second molar (M2) and additional orthodontic intervention.

Materials and Methods

Our research was conducted on principal electronic literature databases, i.e. Pubmed, Embase, Web of Science using these key-words: lip bumper, overcrowding, mandibular second molar eruption, lip bumper AND second molar impaction. Several types of studies were included: case reports and reviews in particular way.

Discussion

Mandibular second molar eruption is a complex event requiring the uprighting of its mesially inclined path, guided by the distal root of the first molar and by resorption of the mandibular anterior ramus. A marked M2 to M1 angulation ($>20^\circ$) is considered a risk factors for correct eruption of M2 that requires adequate space in the bone: both space deficit and surplus appear to be possible factors disturbing the correct eruption of M2. Failure of M2 eruption is an increasing event in normal population, with a multifactorial etiology not jet completely clear.

LBs produce posterior sagittal expansion of the arch , through distal tipping of the M1 due to less forward movement of the crown than the apex that moved mesially during LBs therapy. M1 distal tipping creates mesial space useful to resolve crowding but reduce distal space necessary for a the adjustment processes of M1, M2 and bone spacing, necessary for a physiologic eruption of M2. However, different vertical positions of the LBs (incisal edge, third middle of incisors crown , gingival and subgingival levels) are suggested to produce different effects both at the incisors and the molars. In particular, a molar distalizing effect should be expected with a gingival LB rather than an incisal one. Another factor suggested for M2 impaction, during LBs therapy, is an incorrect fitting of first molar bands. To assess the potential determinants of M2 ectopic eruption and impaction in treated patient is important M2 inclination before the therapy: if M2 has got an inclination with M1 less than 30° has a good chance to erupt normally.

Approximately 7-12% (the mean value of examined studies) of patients treated with LBs has got impacted second molars. This value is at least five times greater than untreated patients (1.4%).

Conclusions

LB therapy increases the risk of second molar impaction. This appliance causes a distal tipping of first molar and a larger angle between M1 and M2 increases the risk of M2 impaction. Individuals undergoing LB treatment have usually anterior

mandibular crowding and it has been reported a connection between second molar eruption disturbances and crowding.

However the impaction of second molar can be easily solved. The patients are in fact treated with spacers between first and second molar which can create space and allow the second molar to erupt into its normal position. Timing of treatment is important: teeth with eruption disturbances should be treated early (11-14 years of age) before root formation is complete. If the treatment with spacers is not successful there are several options for impacted second molars: tooth extraction, orthodontic uprighting, surgical uprighting, transplantation, surgical orthodontic approach and dental implant replacement. In particular way surgical molar uprighting can be performed with or without third molar extraction. Surgical repositioning is best performed before the roots have completely formed , especially when bodily movement is required.

The literature recommends guidelines with LBs therapy: lip bumpers therapy may not be appropriate for patients with preexisting conditions increasing the risk of impaction: first molar closer to the anterior border of the ramus, second molar mesially tipped during root formation, shorter mesial than distal second molar root lengths. In these patients it is possible to use a smaller lip bumper (e.g wire covered with shrink tubing) which does not distally tip the molar back as much as a larger lip bumper with plastic shields.

References

- Nevant CT, Buschang PH, Alexander RG, Steffen JM. Lip bumper therapy for gaining arch length. *Am J Orthod Dentofacial Orthop.* 1991;100(4):330-6.
- Varpio M, Wellfelt B. Disturbed eruption of the lower second molar: clinical appearance, prevalence and aetiology. *ASDC J Dent Child.* 1988;55(2):114-8.
- Davidovitch M, McInnis D, Lindauer SJ. The effects of lip bumper therapy in the mixed dentition. *Am J Orthod Dentofacial Orthop.* 1997;111(1):52-8.
- Osborn WS, Nanda RS, Currier GF. Mandibular arch perimeter changes with lip bumper treatment. *Am J Orthod Dentofacial Orthop.* 1991;99(6):527-32.
- Ferro F, Funicello G, Perillo L, Chiodini P. Mandibular lip bumper treatment and second molar eruption disturbances. *Am J Orthod Dentofacial Orthop.* 2011;139(5):622-7.
- Raghoebar GM, Boering G, Vissink A, Stegenga B. Eruption disturbances of permanent molars: a review. *J Oral Pathol Med.* 1991;20(4):159-66.
- Pogrel A. The surgical uprighting of mandibular second molars. *Am J Orthod Dentofacial Orthop.* 1995;108(2):180-3.
- Shapira Y, Borell G, Nahlieli O, Kufninec MM, Stom D. Uprighting mesially impacted mandibular permanent second molars. *Angle Orthod.* 1998;68(2):173-8.
- Jacob HB, LeMert S, Alexander RG, Buschang PH. Second molar impaction associated with lip bumper therapy. *Dental Press J Orthod.* 2014 Nov-Dec;19(6):99-104.
- Majourau A, Norton LA. Uprighting impacted second molars with segmented springs. *Am J Orthod Dentofacial Orthop.* 1995;107(3):235-8.
- Solomon MJ, English JD, Magness WB, McKee CJ. Long-term stability of lip bumper therapy followed by fixed appliances. *Angle Orthod.* 2006;76(1):36-42.
- Motamedi MH, Shafeie HA. Technique to manage simultaneously impacted mandibular second and third molars in adolescent patients. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2007;103(4):464-6. 30.
- Magnusson C and Kjellberg H. Impaction and retention of second molars: diagnosis, treatment and outcome. A retrospective follow-up study. *Angle Orthod.* 2009;79(3):422-7.