

## RATIONALE FOR ORTHODONTIC TREATMENT IN THE DECIDUOUS AND EARLY MIXED DENTITION – A REVIEW

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**ABSTRACT:** Timing of orthodontic treatment is a controversial topic among clinicians, showing great diversity of opinions; some recommending intervention early in the occlusal development, and others arguing in favour of treatment in the late mixed or early permanent dentition. Early interceptive orthodontic treatment for elimination of different factors affecting dental arch development, growth of maxilla and mandible is well debated and has a mixed response among clinicians, possibly because of little scientific evidence that exists to support such intervention and actual benefit from such early treatment. This article aimed to review various studies and evaluate the efficacy of early orthodontic intervention and concluded that treatment in the early mixed dentition is an effective method to restore normal occlusion and eliminate the need for further orthodontic treatment.

**KEYWORDS:** Interceptive Orthodontics, Mixed Dentition, Preventive Orthodontics

### INTRODUCTION

Timing of orthodontic treatment is a controversial topic among clinicians, showing great diversity of opinions; some recommending intervention early in the occlusal development, and others arguing in favour of treatment in the late mixed or early permanent dentition. It has been suggested that, although almost all types of malocclusion could benefit from early treatment, the effectiveness of intervention depends on type and severity of malocclusion<sup>1</sup>. The main reason for the controversy seems to be that our present knowledge about the timing of treatment is largely based on clinical experience and reflects various approaches and clinical traditions of orthodontic practice. Scientific evidence is limited, and there are only few studies specifically targeting questions about the effects of early treatment. Patterns of occlusion in the deciduous dentition that may be regarded as normal are (a) distal surfaces of the maxillary and mandibular deciduous second molars are on the same vertical plane (b) deciduous molars follow the same relationships as in normal occlusion of permanent molars, the mesiobuccal cusp of the maxillary deciduous second molar occluding into the buccal groove of the mandibular deciduous second molar. The deciduous second molar relationship is not an invariable base for classification in the deciduous dentition, since the foregoing two types are both considered normal. The canine relationship should be employed in diagnosing mesiodistal arch malrelation in the

deciduous dentition. In normal dental development the permanent first molars usually complete their eruption at age 6 to 7 years and assume their normal relationship, in which the mesiobuccal cusp of the maxillary permanent first molar occludes within the buccal groove of the mandibular permanent first molar and the mesiodistal cusp occludes at the occlusal fossa of the mandibular first molar. The permanent molar occlusal adjustment occurs while the premolars are erupting. If the occlusal adjustment does not occur, there is a distal relation of the molars and frequently malocclusion of the entire interarch relation. Our goal in this study was to investigate the orthodontic treatment effects in different age groups.

### Discussion

Treatment of dental crowding without bite abnormalities is normally initiated during second period of mixed dentition when canine eruption takes place. However patients with occlusal discrepancies, impaired voluntary movement and abnormalities in tooth number may require earlier intervention<sup>2</sup>. Early intervention in these cases has an interceptive function by preventing progression to full form of a disorder and excluding interference to normal development of dental arches. Early intervention has however a disadvantage of long period of treatment, which can be justified by reports of increase in severity of age

related crowding and arch length discrepancies<sup>3</sup>. Another justification for early treatment can be to prevent trauma from occlusion in class II patients with increased overjet and upper incisor inclination<sup>4</sup>. Clinical trials that focused on the effectiveness of two alternative treatment modalities including an early growth modification phase and a second phase was compared with single-phase treatment in the early permanent dentition<sup>5-8</sup>. The results showed that, apart from improved self-esteem, only minor benefits were obtained by the early treatment phase<sup>9</sup>. These studies provided valuable scientific evidence for clinical decision making. Other studies<sup>10-12</sup> however indicated that a similar growth-modification phase with higher orthopaedic forces could have resulted in better consistent effects. The development of dentition between 6-8 years of age has many variations, paralleled by variation in development of disorders<sup>13</sup>. It is important to establish a relationship between onset of these disorders inhibiting growth of alveolar bone, development of dentition and planning orthodontic treatment accordingly. Some studies showed that early treatment is effective and desirable in specific situations, keeping in mind however that open bite and increased overjet are known to diminish with elimination of thumb sucking and other habits<sup>14</sup>. Early treatment should depend on the severity of malocclusion and its impact on the neuromuscular system. Early treatment in class III cases produces more favourable results and palatal expansion appears to be more stable if initiated before ossification of midpalatal suture<sup>15</sup>, indicating that crossbite should be corrected at an early stage to prevent asymmetric growth of mandible and maxilla<sup>16</sup>, as crossbite occlusion appears to support development of asymmetric bite force<sup>17</sup>. Deep overbite, increased overjet and open bite was predominant in 6-8 years of age, whereas crowding was the main factor in malocclusion in permanent dentition. So, there is a general consensus that treatment of crowding should start in the permanent dentition<sup>18</sup>. However many questions still remain about the effectiveness of orthodontic intervention in the mixed dentition.

## CONCLUSION

Prevalence of malocclusion is similar to adults in age group 6-8 years with difference is distribution of specific symptoms, deep bite and increased overjet showing highest frequency, which however decline with growth and development. Reverse overjet, crossbite and severe cases of overbite and overjet should be treated at an early stage. Orthodontic intervention in the early mixed dentition is an effective treatment modality for malocclusions.

## References

1. Bishara SE, Justus R, Graber TM. Proceedings of the workshop discussions on early treatment. *Am J Orthod Dentofacial Orthop* 1998;113:5-6.
2. Miotti F A. Epidemiological study and orthodontics. *Mondo Orthodontics* 1991;16:265-274
3. Anders C, Harzer W, Eckardt L. Axiographische Untersuchung von Kindern mit einer Angle-Klasse II/2 (Deckbiss) hinsichtlich ihrer Unterkiefermobilität. *Fortschritte der Kieferorthopädie* 2000; 61:45-53
4. Harzer W, Viergutz G, Hetzer G. Zur Prognose traumatisierter Schneidezähne mit unvollständigem Wurzelwachstum unter besonderer Berücksichtigung kieferorthopädischer Therapieplanung *Stomatologie* 1998; 95:333-339
5. Gafari J, Shofer FS, Jacobsson-Hunt U, Markowitz DL, Laster LL. Headgear versus function regulator in the early treatment of Class II, Division 1 malocclusion: a randomized clinical trial. *Am J Orthod Dentofacial Orthop* 1998;113:51-61. [http://dx.doi.org/10.1016/S0889-5406\(98\)70276-8](http://dx.doi.org/10.1016/S0889-5406(98)70276-8)
6. Keeling SD, Wheeler TT, King GJ, Garvan CW, Cohen DA, Cabassa S, et al. Anteroposterior dental and skeletal changes after early Class II treatment with bionators and headgear. *Am J Orthod Dentofacial Orthop* 1998;113:40-50. [http://dx.doi.org/10.1016/S0889-5406\(98\)70275-6](http://dx.doi.org/10.1016/S0889-5406(98)70275-6)
7. Tulloch JFC, Phillips C, Proffit WR. Benefit of early Class II treatment: progress report of a two-phase randomized clinical trial. *Am J Orthod Dentofacial Orthop* 1998;113:62-72. [http://dx.doi.org/10.1016/S0889-5406\(98\)70277-X](http://dx.doi.org/10.1016/S0889-5406(98)70277-X)
8. O'Brien K, Wright J, Conboy F, Sanjie Y, Mandall N, Chadwick S, et al. Effectiveness of early orthodontic treatment with the Twin-block appliance: a multicenter, randomized, controlled trial. Part 1: dental and skeletal effects. *Am J Orthod Dentofacial Orthop* 2003;124:234-43. [http://dx.doi.org/10.1016/S0889-5406\(03\)00352-4](http://dx.doi.org/10.1016/S0889-5406(03)00352-4)
9. O'Brien K, Wright J, Conboy F, Chadwick S, Connolly I, Cook P, et al. Effectiveness of early orthodontic treatment with the Twin-block appliance: a multicenter, randomized, controlled trial. Part 2: psychosocial effects. *Am J Orthod Dentofacial Orthop* 2003;124:488-95. <http://dx.doi.org/10.1016/j.ajodo.2003.06.001>
10. Kirjavainen M, Kirjavainen T, Haavikko K. Changes in dental arch dimensions by use of an orthopedic cervical headgear in Class II correction. *Am J Orthod Dentofacial Orthop* 1997;111: 59-66. [http://dx.doi.org/10.1016/S0889-5406\(97\)70303-2](http://dx.doi.org/10.1016/S0889-5406(97)70303-2)
11. Kirjavainen M, Kirjavainen T, Hurmerinta K, Haavikko K. Orthopedic cervical headgear with expanded inner bow in Class II correction. *Angle Orthod* 2000;70:317-25.
12. Kirjavainen M, Kirjavainen T. Maxillary expansions in Class II correction with orthopedic cervical headgear.

- A posteroanterior cephalometric study. *Angle Orthod* 2003;73:281-5.
13. Eve T, Olaf L, Harzer W. Prevalence of malocclusions in the early mixed dentition and orthodontic treatment need. *European Journal of Orthodontics* 2004;26:237-244
  14. Kluemperer G T, Beeman C S, Hicks E P. early orthodontic treatment: what are the imperatives? *Journal of American Dental Association* 2000; 131: 613-620
  15. Enlow D H. A morphogenetic analysis of facial growth. *American Journal of Orthodontics* 1966;52:283-299 [http://dx.doi.org/10.1016/0002-9416\(66\)90169-2](http://dx.doi.org/10.1016/0002-9416(66)90169-2)
  16. Thilander B, Pena L, Infante C, Parada S S, de Mayorga C. Prevalence of malocclusion and orthodontic treatment need in children and adolescents in Bogota, Colombia. An epidemiological study related to different stages of dental development. *European Journal of Orthodontics* 2001;23:153-167 <http://dx.doi.org/10.1093/ejo/23.2.153>
  17. Sonnesen L, Bakke M, Solow B. Bite force in pre-orthodontic children with unilateral crossbite. *European Journal of Orthodontics* 2002;24:442-443.
  18. Gianelly A A. Treatment of crowding in the mixed dentition. *American Journal of Orthodontics and Dentofacial Orthopedics* 2002;121:569-571. <http://dx.doi.org/10.1067/mod.2002.124172>

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