

Review Article

Does My Child Need Braces?-A Comprehensive Review

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Abstract: One of the most common questions asked by parents to a dentist is the correct age of undergoing orthodontic treatment in their child. The American Association of Orthodontists (AAO) recommends an orthodontic screening for children by the age of 7 years. At age 7 the teeth and the development of jaws are adequate to evaluate the possibility of having more serious malocclusions in the future. Childhood orthodontics or Interceptive orthodontics are less invasive compared to the conventional fixed orthodontic treatment in adults. It gives the parents enough options to decide on the best mode of treatment for their child, and gives orthodontist enough control over the permanent teeth as they erupt later. The following review article gives a comprehensive review about the most common malocclusions which can be treated at an early stage and the various appliances that help in treating these malocclusions.

Keywords: Interceptive orthodontics, Orthopaedic Appliances, Myofunctional Appliances.

INTRODUCTION

According to Popovitch, F. in (1975) Interceptive Orthodontics can be defined as “any procedure that can eliminate or reduce the severity of malocclusion in the developing dentition”. In the past parents used to seek orthodontic help for their children only at the age of 12-14 years or when all the permanent teeth have erupted. However, according to the American Academy of Orthodontics (AAO), all children should be brought to the dentist for proper orthodontic assessment by the age of 7 years when the first set of permanent molars have erupted. Treating children at an early age of 7 to 11 years will take advantage of the child’s continuing growth and they are more compliant and receptive with treatment at this age (American Association of Orthodontists. 1988). With interceptive orthodontics, fewer teeth are extracted if needed and more serious malocclusions are prevented in the future. Early treatment can prevent poor oral habits such as tongue thrusting, thumb sucking and mouth breathing, narrow or constricted arches, deep bite, open bite, underdeveloped or overdeveloped jaws. To better

understand the factors involved in causing malocclusion, it is important to understand the etiology causing malocclusion.

Common Malocclusions in Children

1. Oral Habits

The most common problem among children are the harmful oral habits such as thumb sucking, tongue thrusting, mouth breathing, bruxism, lip biting or nail biting. These habits are considered intentional and can lead to serious damage to the teeth and surrounding structures if not treated early. The most common treatment method is to intercept the habit with the use of habit breakers. Some of the common habit breakers include tongue crib, tongue spike, vestibular screen, blue grass appliance. According to Kamdar *et al.*, in 2015 clinicians should not only be a doctor to the child but also as a friend, guide and philosopher to both the parent as well as the child to discuss the possible etiology for the habit and to try all the non-invasive methods prior to treating the habits with any orthodontic appliance.

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Table- 1. Graber has classified the etiology of malocclusion into the following categories (Graber, T.M. 1972).

General Factors	Local Factors
1. Heredity 2. Congenital 3. Environment a. Pre-natal [trauma, maternal diet, German measles, maternal metabolism etc] b. Post-natal [birth injury, cerebral palsy, T.M.J. injury.] 4. Pre-disposing metabolic climate and disease a. Endocrine imbalance b. Metabolic disturbances c. Infectious diseases 5. Dietary problems (nutritional deficiency) 6. Abnormal pressure habits and functional aberrations a. Abnormal sucking b. Thumb and finger sucking c. Tongue thrust and tongue sucking d. Lip and nail biting e. Abnormal swallowing habits [improper deglutition] f. Speech defects	1. Anomalies of number Supernumerary teeth, Missing teeth [congenital absence or loss due to accidents, caries, etc.] 2. Anomalies of tooth size 3. Anomalies of tooth shape 4. Abnormal labial frenum : mucosal barriers 5. Premature loss of deciduous teeth 6. Prolonged retention of deciduous teeth 7. Delayed eruption of permanent teeth 8. Abnormal eruptive path 9. Ankylosis 10. Dental caries 11. Improper dental restoration

2. Anterior Crossbite.

The second most common problem in children are the developing anterior crossbite. According to Maxim the “best time to treat a crossbite is the first time you see it”. Anterior crossbite are considered as reverse overjet where one or more maxillary anterior teeth are placed more lingual to the mandibular teeth. Treatment of crossbite should be considered early as it can lead to severe skeletal malocclusion in the future. The dentoalveolar crossbite can be treated with removable appliances such as tongue blade, catlan’s appliance or double cantilever springs, however skeletal crossbite need growth modification appliances like orthopaedic or myofunctional appliances to correct the malocclusion. According to Ceyhan *et al.*, in (2017) correct indication and suitable motivation are important for the success of anterior crossbite treatment.

3. Early Shedding Of Deciduous Teeth

Early loss of deciduous second molar and not maintaining the space for the permanent successor may lead to arch length deficiency with mesial movement of first permanent molar. This can lead to crowding in the future. Hence space regainers are indicated in children to acquire the spaces lost. The most commonly used space regainers are the Gerber’s space regainer, acrylic plate with jackscrew and cantilever springs. According to Chandak *et al.*, in (2015) management of space problems in the mixed dentition plays an important role in deciding when and how to intercept the malocclusion due to premature loss of deciduous teeth.

4. Midline Diastema

One of the main reasons when parents seek orthodontic treatment early in their child is due to the presence of midline spacing or diastema between their two central incisors. Although there can be many possible reasons for a midline spacing to occur at an mixed dentition space, the most common etiology would be the pressure exerted by the developing lateral incisor on the roots of the central incisor, which causes the flaring of the two central incisors.. This stage is also called as “ugly duckling” stage and it is usually a self-correcting malocclusion with the eruption of the maxillary permanent canines (Srinivas, N.C. 2011).

5. Ectopic eruption of teeth

Ectopic eruption of teeth are most common malocclusion seen in early and mixed dentition. The main cause of ectopic eruption are retained deciduous tooth, supernumerary teeth, trauma to the primary teeth, genetic influence or chromosomal disorder. The treatment modalities to correct ectopically erupted tooth can be as simple as extraction of supernumerary teeth if present to extraction of primary teeth and incorporation of space maintainers to prevent crowding or minor orthodontic treatment if required. One of the most common ectopically erupted teeth seen in children is the maxillary canine. A successful treatment of ectopically erupted canine involves proper diagnosis and the degree of impaction involved. Power and Short (1993) showed that interceptive extraction of the primary canine completely resolves permanent canine impaction in 62% of cases and another 17% show

some improvement in terms of more favourable canine positioning (Power, S. M., & Short, M. B. 1993).

6. Anterior Open Bite

Anterior open can be defined by Subtelney and Sakuda (1964) as open vertical dimension between the incisal edges of the maxillary and mandibular anterior teeth. Although the etiology of open bite is considered multifactorial. Treatment planning of open bite usually involves proper diagnosis in terms of the nature of open bite whether skeletal or dental. If habit is the cause of the open bite it can be treated successfully with habit breaking appliance. The skeletal open bite however requires treatment with orthopaedic appliance.

7. Crowding In Mixed Dentition

Management of crowding in mixed dentition involves from a simple observation to extraction of primary teeth with the help of serial extractions or using the conventional fixed appliances if necessary. According to Leighton (1969) if there is a lack of spacing in the mixed dentition period for the permanent successors to erupt there is 70% chances that the child will have crowding in the future. Serial extractions are planned sequential extraction of certain deciduous and permanent teeth to avoid crowding in the adult phase.

8. Interception of Skeletal Malrelations

Most common myth among the parents is that if the child is having a skeletal problem, the ideal treatment time would be to wait until the child is an adult as they have the only option of orthognathic surgery. This leads to many children losing the opportunity of correction at early stage and have to undergo invasive surgery to treat the malocclusion. One of the best time to treat the skeletal malocclusions are during the growing phase of the child. The most common skeletal malocclusion are the Class II and Class III malocclusions.

Interception of Class II malocclusions:

Causes: Excess maxillary growth.
(Restricted by headgear)
Deficient mandibular growth.
(Myofunctional appliances)
Combination of both.

Interception of Class III malocclusions:

Causes: Mandibular prognathism.
(Chin cup therapy)
Maxillary retrognathism and mandibular prognathism
(Face mask therapy)

Treatment Planning In Children

Orthodontic treatment in children involves two phases: The *first phase (7-12 years)* of early orthodontics treatment will ensure the following:

- To enable a proper occlusion
- To correct harmful oral habits
- To intercept a developing problem

- To guide the growth of the jaw bones that support the teeth so that the teeth erupts in correct position with respect to the jaws
- To correct proclined front teeth
- To guide the permanent teeth into a more favorable position
- To establish long-term stability and avoid conventional braces treatment in future
- To improve the esthetics and self-confidence of the child.

The *second phase (12 years above)* involves the conventional fixed orthodontic appliance treatment after the eruption of all the permanent teeth.

- To guide the permanent teeth into correct occlusion
- To correct deep bite and open bite
- To continue improving function and esthetics
- To continue to boost the child's self-confidence.

CONCLUSION

One of the limitations of treating children in the mixed dentition phase involves the unfavourable craniofacial growth, missing permanent teeth, late shedding of deciduous teeth, late eruption of permanent teeth and persistent oral habits. However clinician must also understand the importance of early diagnosis and interception of malocclusion to not only prevent any serious malocclusion from occurring in the future but also to improve the facial esthetics which inturn boosts the child's self-esteem from a very young age.

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