

Benefits of Early Orthodontics Intervention in Children: A Review

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Abstract

When it comes to your children orthodontic treatment then a diamond seems less precious than time. There is an optimal time span to begin your child's early intervention treatment. Mixed dentition is a period of development following the eruption of permanent 1st molar and incisors. During this period, phase-1 treatment is done earlier and often a mixed dentition treatment is meant to concentrate on modification of skeletal system rather than dental system. At little smile's our goal is to provide both timely detection of problems and greater opportunity for more effective treatment to benefit your child/children. The dentist must understand the growth and development patterns before planning a treatment, as jaw growth is the primary factor in orthodontic treatment. Though comprehensive treatment may be required at a later date, the need for early intervention cannot be denied.

Keywords: *Mixed dentition, Children, Early orthodontic correction, Interceptive orthodontics, Preventive orthodontics.*

Introduction

The aim of early orthodontic treatment is to interrupt the growing problem, removing the source, guide the facial development, and jaw bones and allow adequate place for coming permanent teeth.¹

Purpose:

- Correct obvious problems.
- Intercept developing problems.
- Prevent obvious problems from becoming worse.

The problem can be prevented or complexity can be reduced to an extent, so that further treatment is

simplified. From early treatment, almost all types of malocclusion could be benefited. Effectiveness of the intervention depends on malocclusion. The term was given by Lyman Wagers as pre-orthodontic guidance and correction to replace prevention and interruption respectively. The treatment aims to Correct aesthetics of the dentition and facial aesthetics of the patient, improving chewing function and restore proper occlusion. To achieve this goal a repeated multi-speciality dental care is necessary. There are 3 outcomes of early orthodontic treatment. Firstly, no treatment is expected to be necessary. Treatment may be needed in future, while the face and jaws continue to grow, so the child will be followed periodically. If there is a problem, that leads itself to early treatment.²

Mechanism affecting occlusal development:

- Occlusal development and craniofacial growth interaction.
- Genetics and environmental factors.
- Locked occlusion.
- Form and function.

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Table 1. First Dental Visit Guide³

| | |
|--|---|
| <p>Early signs of your child which may indicate the need for treatment</p> | <ul style="list-style-type: none"> • Early or late loss of deciduous teeth • Misaligned bite • Crowding teeth • Large gap between teeth • Front teeth do not meet • Grinding and clenching of the teeth • Thumb sucking, tongue thrusting and other habits • Improper relationship of the upper and lower jaw • Unbalanced facial appearance • Asymmetrical smile • Speech disorder • Difficulty in breathing and chewing or biting • Injury to the mouth or teeth • Extra or missing teeth • Cleft lip and Cleft palate |
|--|---|

These above problems and any other orthodontic conditions can be corrected to avoid potential problems for future adult teeth. Many of the orthodontic conditions are inherited while others can arise from dental injuries, accident or anomalous swallowing. These issues could be easier to modify if they are detected and treated early.

Table 2. Timing of Eruption

| Mandibular | Maxillary | Range (in Years) |
|-----------------|-----------------|------------------|
| 1st Molar | 1st Molar | 6-7 |
| Central Incisor | - | 6-7 |
| Lateral Incisor | Central Incisor | 7-8 |
| - | Lateral Incisor | 8-9 |
| Cuspid | - | 9-10 |
| 1st premolar | 1st premolar | 10-12 |
| 2nd premolar | 2nd premolar | 10-12 |
| - | Cuspid | 11-12 |

Intra-arch Features: In mixed dentition, crowding of the incisors is typical, as the combined thickness of the permanent incisors is 7mm and 5mm greater than primary incisors in the maxilla and mandible respectively.

Early Orthodontic Treatment:

Timing for treatment: Treatment of early orthodontic aims to modify existing or growing skeletal, dentoalveolar and muscular variance to enhance the occlusion and aesthetics of the patient before eruption of

the permanent teeth. Many children require the guidance of dental and facial development as the phase-1 of orthodontic treatment.^{4,5}

Interceptive Orthodontics (Phase One Treatment): It can help identify along with treat early before they develop into more serious oral problems. It begins when child has most of the primary teeth and the jaw is still growing around age 7. At this age such over-crowding and cross bites may be easier to correct. This concept is used in minor problems during development of dentition. It may increase complexity if untreated. Its main function is to give direction to the growth of the jaw bones which supports the teeth. When the children grow and develops, they initiate early signs of jaw problems. Maxilla which grows too much or too narrow can be seen at a young age.⁶ When children above 7 years of age are found to have this discrepancy of the jaw, they should be going for initial orthodontic correction. And also, when children above 8 years of age have malaligned front tooth, initial correction can avert the need to remove permanent teeth. An effective Phase -1 treatment would create space for permanent teeth to an eruption path, or else they will be impacted or shifted.⁷

Pre-orthodontic guidance: Children who have malocclusion in the period of mixed and primary dentition, but don't need banding for therapeutic correction. Early mixed dentition is the ideal time to start phase-one correction.

Goals:

- For growth of the jaw in a way, to achieve the growth of the jaw that will hold all the permanent teeth.
- Improving the way of maxilla and mandible so that they can occlude together.

Advantages:

- Future orthodontic procedure might be more costly, complex and time consuming.
- Greater ability to modify skeletal growth.
- It improves your overall health by reducing or eliminating malocclusions, which are caused by tooth or jaw misalignment.⁸

Benefits if early diagnosis and treatment:

Interceptive orthodontics prevents or reduces progression of malocclusion later in life.

- 1) Achieving better results.
- 2) Determine a better prognosis for how the permanent teeth will develop.
- 3) Creates more space for crowded teeth to erupt.

- 4) Habits are corrected such as thumb sucking and tongue thrusting.
- 5) Bite problems are corrected such as open bite, cross bite and deep bite.
- 6) The growth of the jaw is guided to accommodate emerging teeth.
- 7) Damage to any protruding teeth risk is lower.
- 8) Functional arrangement of teeth, lip and face are recreated.
- 9) Improving child’s appearance, aesthetics and satisfaction of parents.
- 10) Improve facial symmetry.
- 11) Greater ability to modify growth.
- 12) Reduces time for phase-2 treatment with better and more stable results.
- 13) Undesirable oral habits can be prevented.
- 14) Later corrective orthodontic treatment can be prevented.

If untreated, this problems lead to unhealthy environment for the growth and development of teeth, gums & jaws and face.

Table 3: Major Benefits⁶⁻¹⁰

| | |
|-----------------------------------|---|
| Earlier is better | Some conditions are easier to correct, while identified earlier in life |
| Developing Mouth | In mixed dentition period ample space is present. If it is determined earlier that dental arch is small to fit all permanent teeth, then it may be possible to expand the arch. This can guide the teeth into better position in the mouth and makes more space in the mouth and reduces the need to extract teeth. |
| Early Prevention | It can help a child to avoid braces in future, which will save the child’s stress from oral hygiene maintenance as well as parent’s money |
| Out with the Old, In with the New | It can help detect and correct harmful habits like thumb sucking and tongue thrusting habits. As these problems start earlier in life. |
| Enhance Confidence | Every child needs a better occlusion for an attractive face. Early intervention can help to improve facial aesthetics. |

Contra Indications:

1. Impracticable treatment due to social immaturity of the child.
2. Due to social and parental pressure, patient is unable to treat the misaligned teeth.
3. Unco-operative patient to continue the treatment.

Monitoring Progression of teeth:

- After the completion of Phase – 1 Treatment, teeth are not in their final place.
- It will be decided and achieved in the Phase – 2 correction.
- Removal of certain primary teeth may be enhanced eruption during this phase of rest.

- Accordingly, for monitoring periodic recall appointments and mandatory on a 6 – months basis.

Phase-2 treatment: This treatment will be required in many patients. It begins when the child has most of the permanent teeth in their final position. Teeth and jaw alignment are completed with upper and lower braces. It moves all the permanent teeth and gives proper position to the teeth, jaws and a beautiful smile with an attitude face and profile. Certain type of appliances was established in the diagnosis and treatment scheme was used to modify and realign the teeth and jaw, at the beginning of phase – 1 Treatment. Phase – 2 Treatment begins after all the permanent teeth have erupted and typically includes braces for an average of 2 years on all the teeth. Retainers are worn following correction in Phase – 2 Treatment is over to ensure your child retains his or her beautiful and healthy smile.⁹⁻¹¹

Purpose: Extending transparency to achieve the optimal balanced functional and aesthetic outcome that will remain stable throughout your child’s life.

Goals: To ensure that each tooth has an exact position in the oral cavity and compatibility with the tongue, lips, cheeks and other teeth. Once this balance is established the teeth should work properly together.⁹⁻¹¹

Conclusion

Orthodontic modification in the period of mixed dentition opens the door to apply his acuity and experience to an orthodontist and a pedodontics. Malocclusion is not necessarily predictable and also not necessarily avoidable. However, with regular dental check-up and early orthodontic evaluation and treatment, your child may be able to avoid it in the future. Absence of proper scheme can give rise to a big disadvantage. It should be noted that there is commonly more risk in, “Too much too soon, rather than in too little too late”. During developing and growing phase of teeth and bone, growth modification is required. If they are identified earlier in life, then some orthodontic conditions are easier to correct. Most acceptable results can be achieved by thorough diagnosis and treatment scheme. Early orthodontic intervention plays a major role in children.

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Reference

1. Zhang H, Deng F, Wang H, Huang Q, Zhang Y. Early orthodontic intervention followed by fixed appliance therapy in a patient with a severe Class III malocclusion and cleft lip and palate. *Am J Orthod Dentofacial Orthop* 2013; 144(5):726-736.
2. White L. Early orthodontic intervention. *Am J Orthod Dentofacial Orthop*. 1998;113(1):24-28.
3. Musich D, Busch MJ. Early orthodontic treatment: current clinical perspectives. *Alpha Omegan*. 2007;100(1):17-24.
4. Suresh M, Ratnaditya A, Kattimani VS, Karpe S. One Phase versus Two Phase Treatment in Mixed Dentition: A Critical Review. *J Int Oral Health*. 2015;7(8):144-147.
5. Fleming PS. Timing orthodontic treatment: early or late?. *Aust Dent J*. 2017;62 Suppl 1:11-19.
6. Miamoto CB, Marques LS, Abreu LG, Paiva SM. Impact of two early treatment protocols for anterior dental crossbite on children’s quality of life. *Dental Press J Orthod*. 2018;23(1):71-78.
7. Onyeaso CO, Sote EO, Arowojolu MO. Need for preventive and interceptive orthodontic treatment in 3-5 year-old Nigerian children in two major cities. *Afr J Med Med Sci*. 2002;31(2):115-118.
8. DeWood C, Grimes M, Vaden JL. Is the benefit of early orthodontic treatment worth the burden?. *J Tenn Dent Assoc*. 2006;86(2):12-17.
9. Keski-Nisula K, Hernesniemi R, Heiskanen M, Keski-Nisula L, Varrelä J. Orthodontic intervention in the early mixed dentition: a prospective, controlled study on the effects of the eruption guidance appliance. *Am J Orthod Dentofacial Orthop*. 2008;133(2):254-328.e2.
10. Sunnak R, Johal A, Fleming PS. Is orthodontics prior to 11 years of age evidence-based? A systematic review and meta-analysis. *J Dent*. 2015;43(5):477-486.
11. Begum Khan M, Karra A. Early Treatment of Class III Malocclusion: A Boon or a Burden?. *Int J Clin Pediatr Dent*. 2014;7(2):130-136. doi:10.5005/jp-journals-10005-1250