EARLY ORTHODONTIC INTERVENTION (EOI): AN OVERVIEW

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ABSTRACT

As awareness about orthodontic treatment increases there are more and more parent considering orthodontic treatment for their wards at an early age. Coupled with awareness are the various advances in orthodontic material sciences and newer techniques which open up a gamut of treatment options for the Orthodontist. In spite of the above things, there are certain aspects about EOI which remain the same and have stood the test of time. EOI is simpler, shorter and effective. This article reviews the various aspects of timing of treatment in orthodontics and the rationale for EOI. Also a light has been thrown on various conditions demanding EOI. Moreover, discussed briefly will be the potential benefits and risks of early treatment and various EOI modalities.

Keywords: Early orthodontics; Treatment timing; Treatment modalities

We are often faced with the dilemma that whether the orthodontic treatment to be commenced early (in deciduous or mixed dentition) or later (after eruption of permanent dentition). There is also a common question persisting among parent and few general dentists as to, “At what age should the orthodontic treatment be started?” But, as an Orthodontist one wonders, why should there be a dilemma or any of above questions arising at all!

The few of possible reasons for the dilemma could be: a) there are widespread misconceptions and lack of understanding of facts about early treatment among the general public at large, b) the general dental practitioner might have insufficient know-how of available treatment modalities and philosophies and c) the orthodontists may also differ greatly with respect to application of different treatment principles and methods as contemporary orthodontics has many ways of attaining its objectives.¹

The various treatment modalities used could be either of the following: a) Fixed appliance, Myo-functional appliance or combination of appliances, b) Pre-orthodontic guidance or Corrective orthodontic treatment and c) using heavy forces or light continuous forces.

Treatment timing in orthodontics: The main questions asked were as follows, what may be considered as the ideal age to start orthodontic treatment? Or what can be considered as the best time to consult or refer the patients to an orthodontist?? Orthodontic treatment involves movement of teeth which in turns leads to reorganization and rebuilding of bone. It would seem better clinical practice to attempt orthodontic treatment when the biologic conditions are most favorable and the growth potential is at its peak. Specifically, there is no ideal age, dental, skeletal or chronological at which it is best to institute the treatment of malocclusions.²

Generally, if the patient has skeletal discrepancy then the treatment should be instituted as soon as the discrepancy is recognized. Skeletal component in any malocclusions should be considered to be dealt with immediate effect whereas the dental component, if need be, can be handled at a later date. Thus, an ideal age to start orthodontic treatment would be the age at which if the treatment of malocclusion is undertaken, it would create a more favorable occlusion and which in time would influence the dental and skeletal development in the direction of balance and harmony with the surrounding structures.³

Rationale for early orthodontic treatment

Facial growth and development: It is an accepted fact that the growth is the best ally in the orthodontic treatment. If orthodontic treatment is started early, there is an opportunity to direct and correlate the treatment with the growth and allow the natural developmental forces to fulfill their potential for each patient. Facial development involves growth of facial skeleton (jaws and associated structures) and eruption of dentition. Both these processes are synchronized with a range of variability.

Any interferences or inhibiting factors would lead to malocclusion. Therefore, it is apparent that any such factors should be removed as early as possible to start the orthodontic treatment. Thus, depending upon the inhibitory factors and their severity some malocclusions may be treated in deciduous dentition, others in mixed dentition and the remaining in permanent dentition. The rate gradient of facial growth reduces with age.³ In all the growing patients exhibiting malocclusion and aspiring to undertake orthodontic treatment factor of physiological time clock ticking away should be considered. Evaluating this is simplified with the advent of technology and computerization.⁴ The timing of orthodontic treatment should be focused depending upon the degree of growth and maturation in an individual and family pattern.

Tissue response: The longer we wait, the longer it takes for the correction of simple malocclusions because the tissue
response becomes more resistant and retarded as the age advances. Hence early orthodontic treatment should be considered.

Preventive and Interceptive: The orthodontist should prevent or intercept the development of an existing malocclusion in their incipient stages. It is on this basis that early orthodontic treatment receives its justification.

A study suggests, those cases that are definitely caused by sucking habits and in which the habit is corrected by early orthodontic treatment about 50% require no further attention. In the remaining 50% progress of deformity is markedly arrested and an extensive deformity is reduced to one of more simple proportion which may require second period of treatment for final tooth positional adjustment.

The above implies that if in cases where an early treatment is indicated and instituted timely there is sufficient reduction in the severity of secondary malocclusion. The fact that the child may require a 2nd or 3rd period of treatment is no reason for permitting the deformity to develop to such an extent that even the most radical treatment is of little help in restoration of occlusal balance and facial harmony.

Psychological: Sometimes, the dental malocclusion leads to skeletal malocclusion, if left untreated. Also, from psychological point of view, the facial deformities often create a serious mental hazard in young children. Therefore, we should try to prevent a relatively simple deviation from developing into a major malocclusion.

The Orthodontist has dual responsibility in improving esthetic contours of face and also correct occlusal relationship of teeth. Hence early orthodontic intervention where indicated appears in order. According to the author the possible milestone appointment for EOI could be as in Table 1.

### Indications for early orthodontic treatment:

Early orthodontic treatment should be instituted in malocclusions in which there is no reasonable likelihood of self-improvement or self-correction. Following are some of the conditions which make early orthodontic treatment imperative:

- Cross bite (anterior or posterior & unilateral or bilateral)
- Extreme class-II Div-1 or Class-I showing Maxillary protrusion
- Class-III malocclusions (true or Pseudo)
- Pronounced constriction of arches
- Habits like thumb sucking, mouth breathing
- Lower lip trapped behind upper incisors
- Premature extraction, exfoliation or accidental loss of any deciduous teeth 6-8 months prior to eruption of its predecessor

Above mentioned pre-adolescent irregularities are rarely self-corrective. With the passage of time, these tend to become more severe and continue to follow the same unfavorable course if not intercepted by proper orthodontic treatment during mixed dentition developmental stages.

###Modalities for early orthodontic treatment:

- Retraction Plate
- Retraction Plate with flat or inclined bite platform
- Retraction Plate with Z spring, Finger Spring etc.
- Slow Maxillary Expansion (Screw Plate, Quad-Helix Application)
- Rapid Palatal Expansion Appliance
- Growth Modulation Procedures (Myo-functional Appliances, Extra-Oral Appliances)
- Tongue Crib Appliance (Removable or Fixed)
- Oral Screen Appliance
- Space Maintainers
- Serial Extraction Procedure
- Guidance of Eruption Procedures involving slicing of teeth (mesially, distally or both sides)

### Possible benefits of early orthodontic treatment:

- Enhanced scope for guiding & harnessing the natural growth potential
- Possible use of simple appliances
- Relatively short duration of treatment time
• Generally high level of patient co-operation
• Early correction may lead to psychological improvement and act as a confidence booster during growing years

Possible risks of early orthodontic treatment:
• May require future 2nd or 3rd phase of treatment
• Burn the level of cooperation in patient
• Chances of relapse during later growth & development
• Possibility of the young patient being ridiculed among peers at school
• Un-cooperative young patient may bring about more discredit and little outcome

During development of dentition, the facial structures are passing through a period of rapid development with growth centers that are at peak of their activity. Early orthodontic treatment should be allowed to take advantage of this developmental phase. If early treatment is not undertaken then the structural imbalance will increase as will muscular imbalance and each will add to the severity of the other if the misdirected forces are permitted to continue without interception.

Dentists should refer the patients at an early age, preferably 7-9 years, to a specialist orthodontist. If the treatment is not yet indicated, then the patients can be re-evaluated annually/semi-annually so that treatment can be undertaken at the best possible time. If patients are seen at an early age they may be treated by simple mechanics while growth takes place. Orthodontist has a chance to guide the growth of the child month after month and hence proper timing of treatment is of utmost importance in the mixed dentition.

The co-operation for treatment in deciduous and/or mixed dentition can be obtained by proper education of parents. The concern for the health of child should provide necessary stimulus for co-operation. Education of parent and the general dental professionals to the possible advantages of early treatment will permit an orthodontist to accomplish more in less time with better results. In turns, it lays more responsibility on the shoulders of the general dentists and other medical/dental specialists to identify and refer the patients to the orthodontist at an early age. So let our efforts be directed toward guiding growth and eruption, thereby, permitting the natural developmental forces to fulfill their potential to fullest for each patient.

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