

Early orthodontic intervention

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Several features of modern American culture have simultaneously transpired to make early treatment of orthodontic problems more attractive and desirable. Because of the greater numbers of young parents who were themselves orthodontic patients, there is now an awareness of orthodontic problems that did not exist in earlier populations. The popularity of "orthopedic appliances" has also contributed greater professional interest in earlier treatment since orthodontists have discovered growth can be modified by these apparatuses. Further professional interest has been engendered by the realization that many patients can be treated without extraction in the mixed dentition stage, whereas they would clearly be extraction patients if left until the entire permanent dentition is erupted. Combined with this last reason is the growing desire of more parents for nonextraction treatment.

PURPOSES OF EARLY ORTHODONTIC INTERVENTION

Briefly stated, the main purposes of early orthodontic intervention should be:

- To correct obvious problems
- To intercept developing problems
- To prevent obvious problems from becoming worse

Although many orthodontic conditions will fit under that wide umbrella of necessary therapies during the early and mixed dentitions, there are clearly many limitations and exceptions to early orthodontic interventions that need to be pointed out as well.

LIMITATIONS AND EXCEPTIONS TO EARLY ORTHODONTIC INTERVENTION

The success clinicians have had with orthopedic appliances, particularly those of a fixed nature, has encouraged orthodontists to use this approach to treat many Class II malocclusions earlier than in the past.¹ Nevertheless, personal experience along with that of Emil Herbst,² caution against early use of

appliances that cannot rely on the presence of sharply occluded premolars to retain the correction. Clinicians need to recognize that although these appliances can favorably modify the occlusion, there is abundant evidence that they are incapable of significantly augmenting or limiting the size of the mandible,^{3,4} even though they may alter mandible shape and its relationship to the maxilla (J. DeVincento, personal communication).⁵

One idea that continues to fascinate orthodontists is that of expanding the mandible to accommodate all of the teeth assigned to it. This has led to aggressive lip bumper therapy as well as other forms of therapy to increase mandible size. Nevertheless, studies by Little et al.⁶ strongly indicate that expectations of more than 1 mm increase in arch length may be too optimistic, particularly over the long term. Prudence would seem to caution against aggressive use of mandibular expansion. An accompanying idea is to expand the maxilla to allow the mandible to reposition forward.⁷ However, no studies have been performed to confirm or deny this concept, and it currently has vogue based on an anecdotal basis.

Early intervention in obvious bimaxillary protrusions with severe arch length discrepancies also seems presumptuous in that extraction of teeth will inevitably be carried out later in therapy. In these types of cases, one phase of treatment reserved for the permanent dentition would probably be a more sensible approach, and one that would not subject the patient to an overly extended treatment time.

Another idea that has been promoted for resolving arch length discrepancies is that of early removal of maxillary and mandibular second molars.^{8,9} Although as much as 6 mm of arch length gain has been reported with aggressive therapy coupled with second molar extractions,¹⁰ other studies caution about gaining significant arch length with this treatment¹¹ and suggest that 1 to 2 mm of gain is the expected norm.

Finally, early orthodontic intervention is often limited by patients whose maturity, mouth size, or sensitivity threshold is inadequate for the planned therapy.

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Fig. 1. Maxillary incisor crossbite, treated with inclined plane: **A**, original malocclusion; **B**, after crossbite correction; **C**, occlusal view of lower arch with ankylosed primary second molar.

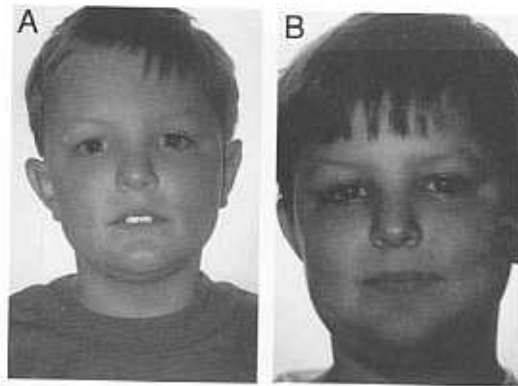


Fig. 2. **A**, Protrusion of maxillary incisors, with resultant "lip trap" and open mouth posture; **B**, after correction of malocclusion and restoration of normal perioral muscle function.

INDICATIONS FOR EARLY ORTHODONTIC INTERVENTION

Having dispensed with those conditions that probably warrant caution at most or no treatment at all in the deciduous or mixed dentition, what are some of the legitimate conditions that are best treated during this time?

Posterior and anterior crossbites certainly merit early treatment. Not only for the functional improvement brought about by therapy but also for the improved esthetics that occurs with the anterior crossbite correction (Fig. 1, *A* and *B*). These types of realocclusion are more easily treated in the mixed dentition than later, and early treatment also gives the clinician ample opportunity to see if relapse occurs. If the correction does not hold, there is still plenty of time and occasion for new intervention.

Ankylosed teeth are another mixed dentition problem that needs orthodontic therapy because it seldom self-corrects (Fig. 1, *C*). It is probably best not to treat this condition too early because space maintenance will usually be needed for several months or even years. Nevertheless, by the time the companion permanent tooth on the opposite side of

the mouth is ready to erupt, the ankylosed tooth should be extracted and the underlying permanent tooth uncovered if necessary.

Excessive protrusions and diastemas that invite injury or avulsions need treatment at an early age to avoid permanent damage to the dentition. Many times these maxillary maladies become self-perpetuating and invite entrapment of the mandibular lip that continues to hold the maxillary incisors apart and forward while simultaneously keeping the mandibular incisors lingually (Fig. 2).

Severe anterior and lateral open bites should have early treatment and are often found accompanied by digit or tongue habits. Failure to completely eradicate these anomalies often leads to a lifetime of malocclusion that eventually becomes impossible to treat without the benefit of orthognathic surgery (Fig. 3).

Ectopic molars are best treated when discovered. These are most often found as the maxillary 6-year molars erupt, but other sites are not that uncommon. Failure to address this problem early enough greatly reduces the arch length for the permanent dentition (Fig. 4).



Fig. 3. A, Open bite with digit and abnormal tongue function and posture; B, establishment of normal occlusion, with elimination of finger habit and abnormal tongue posture and compensatory function.



Fig. 4. Multiple ectopic eruption of permanent first molars.

When severe arch length discrepancies are found in the mixed dentition, and it is clear that bicuspid extractions are needed for resolution, those removals can often be done several months before active therapy is planned. This allows semi-impacted cuspids to start a distal drift and erupt in a position that will make eventual treatment quicker and more effectiveness.

Patients with cleft palates often need orthodontic therapy from the time of birth to allow them to take nutrition without milk escaping from their noses. These patients require continual orthodontic supervision and care until all of their surgeries, orthodontic arrangements, and restorative needs are completed. It is not at all unusual to begin orthodontic therapy the day these children are born and not finish until late adolescence.

Pseudo Class III patients that present with malocclusions that are more dental in nature than skeletal are often amenable to early intervention. Some feel that this therapy is delivered better during the adult dentition,⁴ but I personally prefer to treat these patients in the mixed dentition by the time all of the maxillary and mandibular incisors erupt. If the malocclusion is a borderline case, sometimes opening the vertical dimension as suggested by

Schudy¹² will rotate the mandible down and back and correct a dental Class III without a deleterious effect on the patient's appearance (Fig. 5). Early treatment also allows the orthodontist to monitor the development of these patients and make subsequent interventions at appropriate times should any feature of the correction relapse.

Class III malocclusions that are true maxillary retrusions are probably best handled during the mixed dentition stage because osseous tissues are best modified during the times when rapid growth is occurring.¹³

DeBaets and Chiarini¹⁴ have developed a description of a new category of malocclusion that is not covered by the Angle classification system, and it offers a rationale for early intervention. The reader is invited to read these epochal articles for a complete description of the syndrome, but suffice to say, at this point the Pseudo Class I described by DeBaets and Chiarini is in reality a Class II malocclusion masquerading as a Class I malocclusion characterized by the following characteristics:

1. Deep anterior overbite
2. Mesial rotation of the maxillary first permanent molars

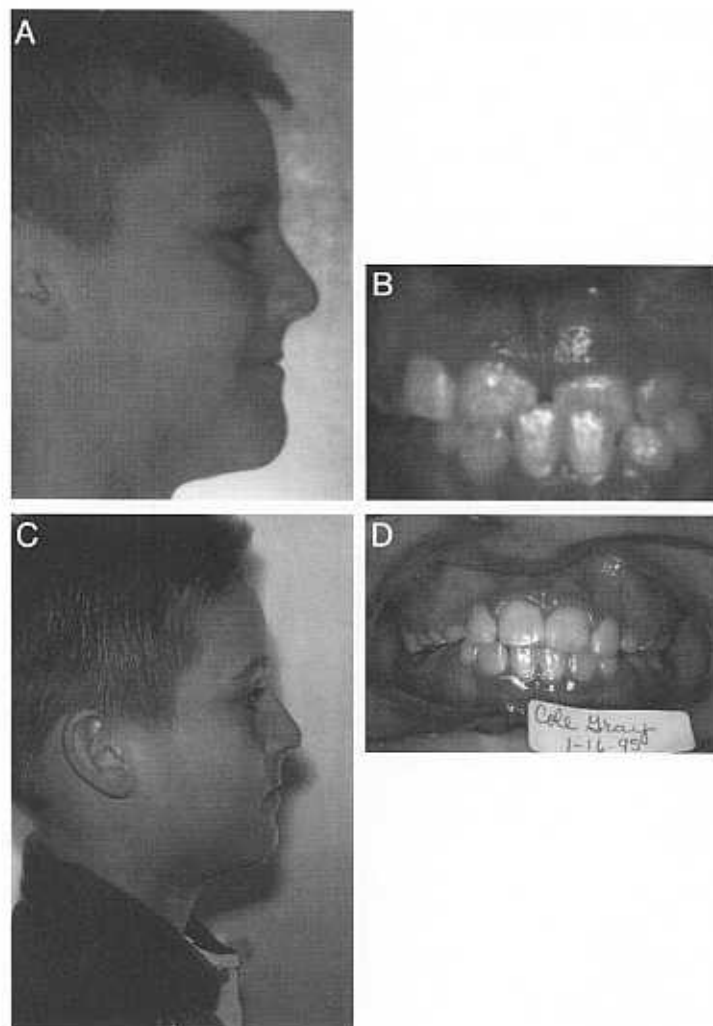


Fig. 5. A and B, Pseudo Class III malocclusion before orthodontic therapy; C and D, marked facial and occlusal improvement after correction of anterior crossbite and eruption of posterior teeth allowing autorotation of mandible.

3. Crowding of the mandibular incisors
4. Mesial eruption of the mandibular canines as a result of a lack of space
5. Overerupted mandibular second permanent molars

By using the interventional methods advocated by DeBaets and Chiarini during the late mixed dentition, orthodontists can intercept this malocclusion and allow the dentition and face to develop in a predictable and stable manner.

As suggested by Gianelly,¹⁵ the late mixed dentition offers the best time for intervention for several reasons:

- The E space still exists.

- Approximately 80% of the patients are still treatable by nonextraction.
- The treatment can be completed in one phase.
- The orthodontist can still capitalize on growth.

The late mixed dentition approach offers many technical advantages; but there are some pecuniary reasons for waiting also. Before any first-phase commitment is made by the doctor, a definite therapeutic objective, time limitation, and treatment fee must be decided, and the family of the patient must thoroughly understand what these goals are. The urgency of having definite time constraints and therapeutic goals for first-phase patients have the following benefits:

- To prevent an unnecessarily extended treatment
- To prevent patient burnout
- To reduce jeopardy of oral tissues
- To allow achievement of specific and limited treatment goals
- To avoid becoming a two-phase treatment for one small fee.

Without a definite time and fee limitation for the completion of a first-phase treatment, there is the risk of the first-phase running into a second-phase almost before the doctor realizes it. At this point the doctor will have the unpleasant task of explaining to the parents why a second fee is necessary and trying to make them happy about an extension of fee and services they may find astonishing.

CONCLUSION

First-phase or early orthodontic treatments offer many advantages to both doctor and patient, and these various therapies need to be part of every orthodontist's armamentarium. Nevertheless, the need to form specific treatment objectives and have definite time constraints along with a reasonable fee necessitate a thorough and rational understanding with the patient's family about the therapeutic expectations. Informing before performing is

never as important as before initiating these types of therapy.

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