Postnatal development of facial and dental structures spans a range from 18 to 25 years until a full complement of 32 permanent teeth is present. A great deal of individual variation occurs during skeletal and dental development within any given population. These long formative periods make it possible for many environmental/genetic influences to affect the dentition and facial morphologies.

Much misunderstanding of “preventive orthodontics” and “interceptive orthodontics” stems from the implication that “early” treatment of malocclusion in children precludes the need for later orthodontic treatment. As facial and dental development continues throughout childhood and adolescence the long-term impact of early treatment may not be predicted. Yet early intervention may help develop a normal occlusion and facial harmony.

Three of the more common principles in early intervention are the elimination of primary etiologic factors if possible, elimination of occlusal discrepancies such as unilateral, bilateral posterior crossbites, anterior crossbite, and the correction of skeletal dysplasia (Figs. 1 and 2A and B). Another need for early orthodontic treatment is managing arch length discrepancies to avoid the future extraction of teeth (premolars) to resolve crowding. Spontaneous relief of pronounced mandibular anterior crowding is unlikely after the permanent lateral incisors have emerged. This fact justified serial extractions in the past in some cases, as increasing mandibular intercanine distance by fixed orthodontic appliance therapy is not predictably stable.

Yet significant arch length stability, establishing a substantially larger dental arch perimeter mesial to the permanent first molars, was demonstrated by Frankel, who showed significant changes in mandibular arch form and uncrowding with the use of vestibular shields in functional appliances. The less obstructive mandibular “lip bumpers” regained popularity to develop intercanine and premolar width and provide space for alignment. The lip bumper alters the force distribution of the perioral musculature and mucoperiosteum to allow uprighting of the mandibular canines and premolars. This serves to increase the circumference of the mandibular arch and helps to unravel the crowded permanent dentition. The mandibular primary second molar space may be controlled with a lip bumper, preventing mesial permanent molar drift. Distalization of mandibular molars may also be achieved. Relief of mandibular crowding and lateral arch development is achieved routinely in the transitional dentition with the use of appropriate biomechanical principles (Fig. 3).
Fig. 2. A, Pretreatment intraoral photograph of female patient, 7 years 10 months of age, with a skeletal Class III malocclusion in the early transitional dentition. B, Orthodontic appliances were used to correct the maxillary transverse discrepancy and anterior posterior discrepancy before the initial phase of orthodontics that started at 10 years 3 months of age on this patient with placement of edgewise appliances. C, Patient undergoing routine edgewise orthodontic therapy.

In contrast to the mandibular arch, there is less controversy regarding decrowding the maxillary arch (Fig. 4). The permanent maxillary first molars may be moved distally and maintained in that position when a proper interdigitation of the molars and premolars is achieved. The maxillary anterior apical area may be increased by distal movement of the permanent maxillary canines and more space becomes available for the incisor roots14,15 (Fig. 5).

Many times, the mesial angulation of the permanent maxillary canines and their distally positioned apices lends itself to a more stable situation in the maxilla after distal movement of the canines. There is more adaptability with changing maxillary arch form (Fig. 6).

The essence of early treatment is timing. Why allow abnormal functions and habits to continue and develop into severe malocclusions and jaw discrepancies in a growing child? Why allow developing arch length discrepancies during the transitional dentition? Diphasic or at times even triphasic treatment is more logical and sensible.
Fig. 4. A, Pretreatment intraoral maxillary occlusal photograph of male patient, 10 years 11 months of age, in transitional dentition with arch length discrepancies. Note missing deciduous canines and total lack of space for permanent canine eruption and mesial drift of the buccal dentition. B, Intraoral photograph of decrowding of auxiliary arch after 10 months of straight pull headgear therapy. Note amount of distalization achieved in maxillary arch and space created for permanent canines. Also note the space created distal to the maxillary second deciduous molars (E’s).

Fig. 5. A, Cephalometric radiograph of a high angle Class II, Division I, skeletal malocclusion before straight pull headgear and lip bumper therapy of a female, 8 years 3 months of age. Note Class II first permanent molar position and overjet of 10 mm. B, Cephalometric radiograph after 2 years 5 months of headgear and lip bumper therapy. Note: Class III first permanent molar position and complete elimination of overjet; change in position of the maxillary first and second premolar positions in relation to the mandibular teeth; and improved maxillary canine position.
Early intervention in arch length discrepancies can eliminate the need for future premolar extractions. The quality of treatment is improved by eliminating etiologic factors restoring normal growth and reducing the severity of skeletal dysplasia to allow for precise tooth positioning in the adolescent patient. When the majority of facial growth has ceased, the treatment options become limited. Proper diagnosis and treatment planning of each individual patient is required in early intervention. A visual treatment objective (VTO) needs to be established in each phase of orthodontic care to finalize the establishment of the occlusion. Dramatic anterior-posterior, transverse, and vertical dimension corrections may be achieved routinely in early treatment if properly approached.

The best allies of the orthodontist in early treatment are time and the growth that is allowed to express itself with proper care.

REFERENCES


