

## TREATMENT OPTIONS FOR JAW GROWTH VARIATIONS

An Editorial by Robert M. Mason, DMD, PhD

**PROBLEMS OF OVERGROWTH OF A JAW:** It is well known among orthodontists that where there is a growth process involving **overgrowth** of a jaw, the rule is that growth should be allowed to proceed and then treat the situation after growth has ceased. The reason for this is that growth cannot be effectively stopped or otherwise modified to the extent that jaw growth can be overpowered; that is, “Mother Nature” is smarter than any of us in dentistry.

What can be accomplished with an overgrowth of a jaw, however, is orthodontic “remodeling” of some of the parts which are expressing overgrowth. An example is a Class III “growing” mandible. Functional appliances, such as the Frankel or Bionator, can influence the shape of the growing mandible by *remodeling*, which may give the appearance of manipulating growth, while instead, long-term studies show that such jaw shape changes are only temporary. Over time, the overgrowth pattern returns. Hence, the orthodontic caveat: it is best to let a mandible grow to its full extent and then treat it either by a combination of jaw surgery and orthodontics, or orthodontics alone which may amount to “camouflaging” the problem.

What happens dentally in the example of overgrowth of the mandible is that in an attempt for the body to try to maintain dental contacts, the lower incisors tip lingually and the upper incisors tip labially (facially) in an attempt to maintain anterior dental contact relationships as lower jaw growth continues. If the treatment decision is to try to correct the problem with orthodontics alone, Class III elastics would be used along with orthodontic fixed appliances to maintain the lingual tipping and maxillary flaring of incisors. If, however, the treatment decision is made to combine orthodontic treatment with jaw surgery to “set back” (retract) the mandible, the orthodontic set-up maneuvers prior to surgery involve moving the lower incisors labially and the upper incisors distally so that they are then aligned appropriately over the arch to which they are attached.

The orthodontic process of “decompensating the dentition” simply means that the teeth are being aligned in an ideal position in each arch. In doing so, an uninformed observer may wonder whether the orthodontist knows what he/she is doing since the malocclusion becomes even more evident – until surgery is performed with the intended result of the teeth then fitting normally in occlusion.

From the discussion above, it should be obvious that where there is a skeletal malocclusion such as overgrowth of the mandible, surgery to correct the overgrowth is the ideal treatment plan whereas a non-surgery orthodontic approach is termed a “practical” or “compromised” plan. Such plans are often selected by patients who do not agree to a surgical plan. In such instances, the opportunities for relapse are greater and the opportunities for the tongue to develop into a myofunctional problem are heightened. This is why it is important for orofacial myologists to find out as much as possible about the orthodontic treatment plan and to be informed as to whether there is a skeletal malocclusion problem that will be treated with surgery, or not.

Other skeletal malocclusions that may or may not be treated with a combination of orthodontics and surgery include: 1) vertical maxillary excess (overgrowth downward of the upper jaw), in which a patient exhibits too much gingival tissue; 2) mandibular retrusion (a small mandible); 3) maxillary retrusion (a small maxilla); or 4) an excessively large maxilla (maxillary hypertrophy). In each of these conditions, a treatment decision will be made as to whether to combine orthodontics with surgery (the ideal plan), or whether to perform a “practical” or “compromised” orthodontic treatment to achieve an improvement but

not an ideal result. Again, it is the “compromised” treatment plans that are more often accompanied by an orofacial myofunctional disorder (OMD), but also, skeletal malocclusions often involve OMDs that may or may not spontaneously resolve and disappear following surgery. In each instance, a thorough knowledge of the presenting problem and treatment decisions are important for the orofacial myologist to know.

Additionally, for problems of growth excess, the orthodontic caveat to allow mandibular jaw growth to progress without interference is based upon knowledge that mandibular growth cannot effectively be stopped with chin caps, headgear, or removable appliances. In fairness, it should be noted that many Japanese and other orthodontic providers believe in chin caps as being effective. Most USA orthodontists dispute this view.

**PROBLEMS OF GROWTH DEFICIENCY:** Problems of **deficient jaw growth** are yet another matter. Where a maxilla or mandible lags in growth in the horizontal dimension, early treatment may be indicated. With retrusive, small maxillae, whether the result of a repaired cleft palate or simple hypoplastic growth, early intervention is often successful with a **reverse** (also called a Delaire) **headgear**. Such headgear uses the forehead and chin as anchors for a facemask that has hooks attached to a vertical bar extending from forehead to chin. Elastics running from the bar to molar or canine tubes attached to orthodontic bands or brackets provide a means of advancing the maxillary dental arch, and often, the maxilla itself. Such orthopedic therapy is effective between ages 6 and 10 years, but is not likely to succeed after age 10. Although **reverse headgear** is worn for as many hours as possible on a daily basis, most orthodontists do not insist that a child wear the headgear to school, as the teasing would be relentless.

Also, early surgery to advance a maxilla or mandible can be performed when the jaw deficiency is severe. Since the maxilla has essentially reached adult size by age 8, early surgical advancement of a deficient maxilla can be accurately predicted and achieved, while mandibular overgrowth is another matter since growth of the mandible normally continues through the teen years and in some

**DISTRACTION OSTEOGENESIS:** The advent of distraction osteogenesis surgery has changed the playing field dramatically. “Scoring” (partially cutting) a bone and then placing pins (screws) in the bone – connected one with the other by an expansion mechanism, permits the surgeon and orthodontist to expand/elongate jaw bones, or to even retract/shorten facial bones, as needed. As the bone expands or is retracted, the bony parts slide along and remodel. Distraction osteogenesis (separating a bone without fully cutting through it) can often be done with the distraction framework placed (and hidden) entirely in the vestibule of the mouth, but in many cases, the screws extend through the soft tissues and muscles and are on the outside of the cheeks.

**TADS:** The advent of miniscrews, or TADS (temporary anchorage devices) placed in the maxilla above the teeth roots, or in the palate, or the mandible below the teeth roots, provide skeletal anchorage that allows for more effective movement of dental arches and their segments than is possible with headgear.

**ORTHODONTIC POSITIONERS:** Another part of orthodontic history was the use of **positioners** in the retention phase of orthodontics. A positioner is a moldable soft removable appliance that has been made/molded over teeth on a plaster model onto which teeth have been reset to an ideal position. Following orthodontics, a positioner is designed to provide some small changes in tooth/teeth position that will achieve the most ideal result.

Many orthodontists used positioners as the final procedure to perfectly align the teeth; however, the appliance covers teeth in both dental arches and makes it difficult to breathe normally with the positioner in place. Even cutting breathing holes in the positioner at the incisors does not help much for many patients. As a result, “compliance” (consistent dedication to the wear schedule) has been a problem with positioners. Most patients greatly disliked wearing a positioner. As a result, many, perhaps most, orthodontists have discontinued using positioners as a final finishing procedure, relying instead on orthodontic positioning or a single-arch labial-lingual retainer with teeth reset to an ideal position.

**MYOFUNCTIONAL APPLIANCES:** Attempts to address various malocclusions and OMDs early on with “myofunctional-type appliances”, fit over teeth in both arches, and claimed to have the ability to influence growth, should raise some obvious suspicions on the part of any clinician, parent, and patient. While these appliances may have some value in retraining the tongue, the preference would be for a trained myofunctional clinician to provide such services. The claims of “myofunctional appliances” being able to stop, remodel, or otherwise influence facial growth lack adequate scientific documentation, and the need to intervene early-on with simple problems of crowding remains controversial, whether with fixed or removable appliances.

**OTHER REMOVABLE APPLIANCE SYSTEMS:** The so-called ‘myofunctional appliances’ and any removable appliance may have some value. However, the continued claims of a specific removable appliance as being able to manipulate or modify jaw growth and facial form are, in my opinion, overstated and not well documented. Removable appliances touted as “myofunctional appliances” are not capable of correcting all developing dental alignment conditions, nor is orofacial myofunctional therapy a magic pill that can be applied effectively to all oral behaviors and postures with all patients, including those individuals with specific syndromes.

Caution should be the watchword when deviating from traditional, well-proven procedures.

**CAUTIONS:** Myofunctional clinicians are advised to be suspicious whenever a specific removable appliance or set of removable appliances is touted as being the answer to a host of orthodontic problems. There are many such appliances currently being advanced by general dentists who compete with orthodontists for orthodontic patients. Even some orthodontists who wish to distinguish themselves from other orthodontists are known to advocate for a particular removable appliance with claims made that the appliance is a worthy substitute for traditional orthodontic treatment. The astute clinician is warned to be wary of such claims and appliance systems, and the motivations behind the advocacy for such alternate treatment regimes. While it is tempting to embrace the effective and enthusiastic claims of those who try to advance such appliances, orofacial myofunctional clinicians are encouraged to be wary of those selling alternate therapies that benefit the provider financially but that lack compelling evidence.

**CONCLUDING STATEMENT:** As one who has had access to every appliance system, I remain a skeptic of the claims made by those with a specific self-serving agenda regarding a specific removable appliance, its successes, and the focus of discussions of such appliances in groups peripheral to the primary national and international orthodontic professional associations. By contrast, traditional and newly developed orthodontic procedures are well researched and reported in meetings and published in peer-reviewed journals of the American Association of Orthodontists (AAO), The Edward H. Angle Society of Orthodontists, and the European Orthodontic Society, where such discussions and interchanges should take place.