POPOVIC & KOLLEGEN
Praxis für Kieferorthopädie

Adult treatment

4. Avoiding jaw surgery in adult patients:

- MARA (Mandibular Anterior Repositioning Appliance)
- TLB (Torque-Lipbumper)

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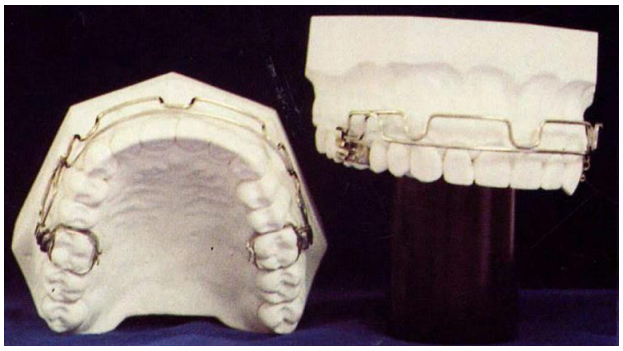

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After cessation of natural growth, orthodontic correction of jaw malrelations is much more difficult, because growth as an important factor in the treatment of children and adolescents can not longer be exploited. While potential growth facilitates treatment in those non-adult patients, an orthodontist is faced with a great challenge in adult treatment – a challenge he alone may not be able to meet. A reason for that is that orthodontic treatment modalities available to us cannot change bony anatomy in adults. No orthodontic appliance will make a fully grown upper or lower jaw smaller or bigger. It is problematic as well to widen the upper jaw when it is too narrow. The palatal suture is closed in adults. A therapy that promises success will most likely be a surgical one or a combination of orthodontics and orthognathic surgery.

Alternatives to surgical correction have been developed, both originating in Germany, in fact in our practice: the Mandibular Anterior Repositioning Appliance or “MARA” (1) is one. The second is the so-called Torque Lip Bumper or “TLB” (2).

MARA (1) is the name of the appliance that is used – as the Anglo-Latin name suggests - to advance the lower jaw (anterior = forward). In cases with receding chins (lower jaw too far back) this can improve the profile tremendously. In cases with jaw joint (TMJ) problems, the MARA also helps relieve the TMJs, because it decompresses the joints and thus takes the mechanical load off the tissue. A MARA can be used in children with great success, because it stimulates lower jaw growth. Clinicians have even observed bone remodelling in adults, which helps stabilise lower jaw advancement.

The MARA consists of metal bands on the first molars and components that advance the lower jaw gradually, by using shims in different sizes. This advancement is done by the patient himself, as he bites in a physiological position. If he attempts to bite in his old position, which is further back, a mechanism will automatically block this. In the figure above, you see a vertical, elbow-shaped metal leg attached to the upper first molar and a smaller, horizontal leg, attached to the lower first molar. If the two collide, as it happens when the

patient tries to bite too far back, they will block this movement and prevent mouth closure. This is no passive action, but the patient must actively advance the lower jaw in order to be able to bite together. Thus, the entire chewing musculature is trained and adapts to the new lower jaw position. Consequently, it is possible to avoid lower jaw surgery at least in mild to moderate cases to treat a receding chin or TMJ problems.

A different problem is often encountered in patients with upper air passage problems during the course of their childhood: an upper jaw that is too narrow. This often originates in an obstructed nasal air passage, when the patient switches to mouth breathing. Automatically, he will lower the tongue, which then results in insufficient growth stimuli for the upper jaw. The tongue normally rests behind the front teeth on the palate and thereby exercises pressure on the upper jaw which then causes the upper jaw to grow both in length but – more importantly – in width. Perhaps the upper air passage has been cleared in the meantime, or it may have only been impaired for a short space of time during a critical point in adolescent growth, maybe due to frequent respiratory infections. In the end, unfortunately, growth was disturbed. If the problem was spotted early on, treatment may be fairly easy, because the palatal suture that connects the two halves of the upper jaw is still open. Things appear different in adults. In such a case, the palatal suture usually needs to be “weakened” or even “split” surgically, in order to make it wider. Yet, here also, there is an alternative to surgery that also enables the clinician to achieve his goal: the Torque Lip Bumper or TLB (2). The TLB is an appliance similar to removable braces and is worn in the upper jaw (fixed with tubes on the molars). It helps keep pressure from the inner cheeks and the lips off the teeth. This is why the appliance is called lip bumper: it works a little like a car bumper does. While it is being worn, it simultaneously redirects the pressure from the cheeks and lips so that it is transferred to the gum and the periost (the thin “skin” around the bone that supplies the bone with blood). Pressure on the periost will cause the bone beneath it to grow thicker. This is an application of the biomechanical principle that bone always is reinforced in regions subject to mechanical loads. In places with little mechanical loads, bone will be thinned out. In this particular context, this means that bone grows in thickness where the cheeks and lips create pressure. On the palatal surface, bone is lost. The overall effect is that the jaw grows a little in width, all without having to cause injury to the palatal suture by surgery. This effect has been named after the German orthodontist Fränkel. One should add, though, that these treatment modalities, again, are applicable only in mild to moderate cases.

You can see that – even in adults – surgical intervention is not always necessary. We are glad to give you advise if these two alternatives to surgery can yield the desired results in your case as well.