# Why is orthodontics important? And is it necessary at all?

Werner Schupp

There is evidence to prove that orthodontic treatment reduces anterior tooth trauma in proclined maxillary incisors. The development and consequences of caries lesions and periodontitis can be partially prevented by correcting tooth misalignment. The aesthetic improvement of the orofacial appearance that orthodontics offers enhances children's and adolescents' emotional development, self-esteem and quality of life. The prosthetic-restorative provision for the dentition can be limited in the case of orthodontic anomalies. Orthodontic treatment can have a positive impact on the airway space. All this is described meticulously and scientifically proven by the authors in the new S3 guideline published in Germany[1].

Based on this data, are we justified in practising orthodontics so much and in such a complex and sometimes invasive way? Can the globally maintained goal of completing orthodontic treatment in an Angle Class I relationship still be met? Is there sufficient evidence for this? Do people need occlusion, and if so, how much? Can they maintain their function and health without physiological occlusion? Some believe so.

But what if Gerd Christiansen[2] is right in stating "Occlusion protects the functional joint space, and thus serves to maintain the health of the craniomandibular joint"? Do we have to think about occlusion and its relation to the craniomandibular system after all? Hugger and Kordaß[3] state that "under physiological conditions, the temporomandibular joint represents a pressure-loaded joint whose individual articulating components are loaded differently due to the leverage ratios depending on the position of occlusal contacts as well as the size and direction of contraction of the jaw musculature". Does occlusion have a significant influence on the craniomandibular system and thus on our patients' health? Can we negate the importance of occlusion in our field even if there is only an initial suspicion of it? Wang et al[4] demonstrated that a reduced molar relationship, i.e. a lack of posterior vertical support, is associated with an increased risk of developing craniomandibular dysfunction. All practitioners who deal with dysfunctions experience this every day, even without having categorical evidence of it.

But where do we already possess truth? In "Faust", Goethe[5] writes:

"Mysterious, even in broad daylight,
nature won't let her veil be raised.
And what she will not to your mind reveal,
you will not wrest from her with levers and with screws."

According to Hugger and Kordaß[3], biomechanical concepts are based on functional elements that can mainly be observed in intact systems:

- acceptable intraocclusal distance (distance between the posterior teeth in the maxilla and mandible when the rest position is assumed or the closest speaking space is determined);
- stable tooth-to-tooth contacts;
- bilateral centric occlusion contacts;
- synchronous bilateral contact of the posterior teeth with slight arch closure;

- multidirectional freedom for tooth-guided movements of the mandible;
- retrusive functional space.

In the physiological position of the joint (and this applies to every joint), the capsuloligamentous structures are maximally relaxed and the agonists and antagonists are in equilibrium. In this position, the maximum amount of joint play is possible. For the temporomandibular joint, its final position is determined by the occlusion. In this position, the joint needs a defined joint space with physiological joint play. This also includes a retrusive free space.

What does this mean for orthodontics? The setting of the final occlusion should meet the above criteria. The occlusion is congruent with the physiological joint space. From an orthodontic perspective, the occlusion must therefore be set in a physiological joint position in the virtual treatment simulation (VTS). Here lies an emerging domain of aligner orthodontics. The missing link, the virtual articulator in the VTS, is established. We can now correct the tooth misalignments with reference to a physiological condyle position in a "global centre of rotation"[6]. We will do this in a report for the JAO soon.

Orthodontics is and will remain important. Perhaps we should redefine some of its goals.

## References


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