

The orthodontic Appliance / Machine / Informed Consent

Definition

Orthodontics is using fixed appliances in the most complex and interactive region of the human body, mostly during growth. Due to the construction and effectiveness of orthodontic appliances in combination with growth interference orthodontics is ranked in the highest risk levels of II b to III, as this appliance is fixed in the body - on teeth – (implanted), and it is loaded with energy for doing work:

"The appliances used by the orthodontist are machines for doing work in the physical sense during a period of weeks or months."

[Jarabak, J.R., Fizzell, J.A., Technique and treatment with Light – Wire Edgewise Appliances, Mosby Company 1972]

Consequences

It must be realised, that *the orthodontic machine* is moving teeth and is changing all functional and morphological relations by its own, *not the orthodontist!*

By this the orthodontist is constructing and implanting this machine, is loading this machine with energy, is navigating this machine indirectly and is distributing this machine- with full liability for each part, its efficiency, individual controllability and its medical value / safety.

As the orthodontist is influencing and altering the complex function of the organ of mastication and adjacent organs so highly, basics of Functional Anatomy are essential for diagnosis and treatment objectives, otherwise the orthodontists may be in danger to cause dysfunctions.

Common Orthodontics

Of similar danger is the application of the orthodontic machine with wires of reduced controllability. Most treatments start with insufficiently controllable, super elastic wires of the Ni-Ti-group as a levelling arch. They are known to be highly uncontrollable, but easy and quick to be applied:

"The disadvantage of super elastic wires is, that the orthodontist cannot bend either curves, nor torque or loops in such sorts of wires".

[Sernetz, F., Dentaforum, : Physikalische und technische Eigenschaften von Drähten für die Kieferorthopädie und Orthodontie, Quintessenz Zahntechnik, Teil 4 (Ni-Ti- Legierungen), p 892, 1999,]

It is hardly to believe, that a patient will give his consent to the application of an insufficiently controllable wire for uncontrolled levelling and treatment.

The patient additionally should be informed, that *" the superelastic, 'light wires' of the NiTi- group cause significantly larger root resorptions, 140 per cent greater in perimeter, area, and volume, than on the teeth of the 'steel group'."*

[Weiland, F: Constant versus dissipating forces in orthodontics: the effect on initial tooth movement and root resorption. European Journal of Orthodontics 25 (2003)335-342, Award of European Orthodontic Society, EOS]

This effect is explained by the specific characteristics of the Ni-Ti-alloy, giving the effect of a continuous, equal level of force, causing reduced recovery of stressed tissue (non-linear behaviour) in contrast to a linear behaviour of stainless steel with a continuously declining force level for tissue recovery (linear behaviour).

CMD- Orthodontics, the alternative

The alternative is a reduction of the oversized common slots-sizes of .018 x .025 or .022 x .028 inch slots and wire sizes of .016 x .022 and larger down to .016 x .020 slot-sizes and wire sizes down to .010 x .020 inch of Bio-Functional Orthodontics, BFO.

Flat wires of stainless steel provide all qualities for orthodontic need: light, linear reacting forces for biological recovery, high resiliency, high elasticity and high formability for individual bends for individual teeth positioning.

This BFO-technique was introduced as Fixed Functional Orthodontics on the American Orthodontic Association, AAO- meeting in 1999, evolving to Bio-Functional Orthodontics, BFO, on the AAO-meeting and the meeting of the World Federation of Orthodontics, WFO, 2000, in Chicago.

BFO-mechanics and their machines differ substantially from common orthodontics in applying differential System-Loading additional to wire loading, which is unknown and more or less impossible in common orthodontics. Differential system loading is the most important prerequisite for controlled navigation of teeth and occlusion.

Finally BFO-Techniques became the basis of CMD-Orthodontics, the treatment of Craniomandibular Dysfunction, CMD and medical indication of orthodontics.