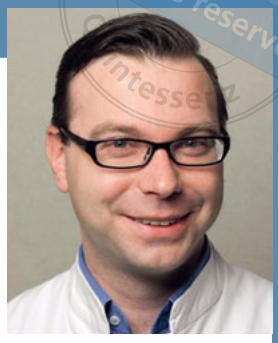
Learning by doing



Karl-Friedrich Krey

Since the early days of orthodontics, treatment with thermoplastic removable appliances has been practised. In the first attempts, manual setups of gypsum casts were performed to correct minor malposition of teeth, especially after fixed multiband appliance treatment. This was done by experienced dental technicians in close communication with the orthodontist nearby.

The revolution started in the 1990s with industrialisation of aligner production. With growing numbers of patients, manufacturers and orthodontists gained more and more experience in treating complex cases. Today a convenient fully digital workflow, from intraoral scan, virtual treatment planning, 3D printing and high-throughput manufacturing of aligners, is state of the art. Complex software is used by trained specialists to plan the sequence of aligners to achieve the desired goal. However, the underlying mechanisms on which assumptions of biomechanics, force generation, attachment placement and shape, and anchorage are made remain sometimes a little nebulous.

The challenge in aligner orthodontics is not to generate a nice looking setup, but to generate a biologically adequate sequence of aligners in the interplay between force generation and anchorage. But how can an orthodontist judge if the proposed setup and sequence will work in the biological reality of the patient? Experience may be the first answer, but everybody has to start somewhere – particularly in postgraduate orthodontic education. So the second answer is reading. There are numerous publications in a wide range of scientific journals investigating the underlying mechanisms of aligner treatment. The third and most important answer is to start your own aligner production.

Today in numerous orthodontic practices and orthodontic university departments, intraoral scanners, treatment planning software and 3D printers are available. In my opinion, this is the best way to learn to understand aligner orthodontics. There is immediate feedback regarding your scan quality and processing of the virtual models, and you can learn the weakness and strength of the manufacturing process, and much more. With the full set of diagnostic records on your desk, it is time to think about the treatment goal. As aligner orthodontics is just another way to treat, it is important not to renounce orthodontic diagnosis. The base for any further considerations is still a complete patient history, clinical examination – most important in my opinion – and further records like photography and panoramic and lateral head radiography.

When making the setup and staging, you are forced to think deeply about any perspectives of the patient, the biomechanics with anchorage, and so on. Every single tooth comes into focus with these decisions: Is there enough bone for movement? Do I need attachments? What shape of attachment is best? How much slicing? A lot of questions arise and you may not always able to find a solution. There is a fourth answer: Get connected with

colleagues, build a network and share your knowledge. One way is to read and possibly publish your work in the Journal of Aligner Orthodontics.

With this knowledge and experience, you will be able to develop a different view of the aligner setups and staging sequences provided by commercial vendors. Keep in mind that you are the orthodontist who is responsible for the success of the treatment and the health of your patient. Aligners are no more or less than the appliance that works for you.

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