



Endodontic treatment is one of the main topics at IDS

Rapid change over the past decades

Endodontics is becoming more and more successful thanks to consistent therapy methods with trusted and innovative techniques. The International Dental Show (IDS) in Cologne will be presenting the entire spectrum: fast and minimally invasive file systems, consistent torque control, single-use files vs instrument disinfection, sustainability and artificial intelligence.

Hardly any other specialised field within dental medicine has undergone such rapid change over the past decades compared to endodontics. Both the increasingly more profound scientific findings and a host of technical innovations make it possible to preserve teeth that it wouldn't have been possible to save years ago. Fundamental, important correlations that are essential for the therapy are outlined below and possible modifications in the treatment protocol that are closely linked to the scientific and technical developments of the past years described.

Difficult cases becoming easier?

In general, in the field of endodontics solving the "difficult" cases is becoming easier and even the cases that were still "too difficult" a few years ago are becoming treatable. Studying the scientific pub-

lications of the past years, there is a clear trend towards less invasive techniques while the biological targets of the endodontic therapy are at the same time maintained. The dentist exploits all opportunities of current endodontics to ensure the highest probability of success: highly-flexible nickel-titanium instruments, magnifying glasses, an operating microscope and digital volume tomography (DVT), optional warm filling techniques, bioceramic sealers, activated rinse liquid and modern obturation materials.

The file sequences during the treatment are gradually becoming easier—up to the usage of just one single file for cases that are not too complex. The selection of a specific system is made according to the requirements of each respective case, depending on whether the priority lies for instance on a substance-preserving technique (also with a view to



possible retreatments) or the speed (i.e. at the request of the patient). At IDS visitors have the opportunity to choose future file systems or several systems from a large selection.

The rinse liquid can be activated using Erbium YAG laser-induced shockwaves (PIPS, photon-induced photo-acoustic streaming) or it is achieved by ultrasound or sound wave activation of the rinse liquid. The success can meanwhile be measured in the scope of studies using microbiological methods (qPCR/quantitative polymerase chain reaction).

Beyond this, more attention is being paid to the theme "Sustainability", indeed in many respects. For instance is the single-use file sustainable? It still has to be weighed up: From a therapeutic point of view in comparison to files used several times the risk of breakage is reduced which in turn increases the chances of success. To further lower the risk of breakage, endodontic motors with torque control are recommended. The files that are used

several times appear to be more environmentally-friendly at the first glance. On the other hand the amount of disinfectant needed and the hygienic residual risk increases. A tour round IDS shows the visitors the pros and cons and thus helps them make the right decisions as to which instruments are the best recommended option for their practice.

Furthermore, artificial intelligence is becoming the highly regarded impulse for innovations in the endodontics sector. Because this specialised field is predestined for being supported by artificial intelligence (AI). During the treatment a large amount of data is gathered and artificial intelligence is suitable for precisely that: analysing large amounts of data, recognising patterns in the data and coming to the resulting relevant conclusions. The dentists can make use of this

information for example when opting for or against a specific therapy.

Today, among others the degree of restoration, existing root fillings, X-rays (2D/3D), intra-oral images, endodontic length measurements and torque recordings belong to the endodontic data pool.

At present, artificial intelligence still reaches its limits as far as predicting treatment results and the final assessment of the treatment quality are concerned. The large amounts of data collected possibly do not yet suffice here. For example, whereas AI knows the torque value during every stage of the treatment, the angle of insertion of the files remains unknown. However, it is important to know this in order to map the treatment procedure pretty accurately.

Source: GFDI/VDDI