Dentsply Sirona Develops New 3D Endo Software for Better, Safer and Faster Endodontics

Endo Meets 3D

With the largest research and development platform in the industry, Dentsply Sirona is committed to its mission of empowering dental professionals to provide better, safer, faster dental care.

York/Salzburg: Dentsply Sirona has developed yet another innovation in endodontics: 3D Endo is the first CBCT-based software that enables endodontic treatments to be preplanned and optimized on the basis of imaging data from the ORTHOPHOS units. This new advancement is also the first software project to combine the know-how and experience of Dentsply Sirona’s market leading engineers, scientists and software developers in both its endodontics and digital radiography units. Based on 3D data and its specific visualization, the practitioner is able to case-specifically recognize the demands on the root canal treatment tooth, analyze the natural shape of the root canal and select the appropriate files using the integrated file database. As a result, the endodontic treatment is more efficient and safer, as well as with significantly improved patient communication.

Since, with the help of a planning report or demonstrative capabilities directly in the software, the practitioner can clearly explain the initial situation and the appropriate treatment to the patient. Dentsply Sirona plans to introduce this software in the coming months upon the receiving the necessary regulatory approval.

For years, Dentsply Sirona has been collaborating and creating integrated solutions in the area of endodontics. Back in 2014, WAVEONE® by Maillefer and RECIPROC® by VDW, both leading reciprocal file systems, were first integrated into the TENEO treatment centers and more recently into the SINIUS centers, which considerably improved the workflow of the Endo function. Now, with new 3D Endo software, Dentsply Sirona will offer an even more comprehensive integrated approach to endodontics which will be available on the market this fall.

"Dentsply Sirona is working to shape the future of endodontics worldwide by continuously striving for better patient outcomes and by empowering dental professionals with world-class innovative solutions, education programs and clinical procedures. This new software is yet another way in which our platform will redefine endodontic care for dental professionals and patients by setting new treatment standards in efficacy, safety and simplicity," says Dominique Legros, Group Vice President, Dentsply Sirona Endodontics.

By Dentsply Sirona

Dentsply Sirona announces the introduction of another integrated solution to the market: a new 3D imaging software to improve the planning and workflow of endodontic procedures.

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“Find it, fix it, and leave it alone”

By Prof. Philippe Sleiman, Lebanon

This three-part principle, though originating in the field of osteopathy, can find great application in modern endodontics, where we deal with routine root canal treatment, as well as with cases in which a patient is in a compromised state of health for which the solution may be a routine root canal treatment, and anything more than that would be overtreating.

Initially, we need to find the problem, by analysing the clinical situation and identifying what is going wrong. This task is truly difficult. Making the correct diagnosis based on-
- the patient’s history, for we need to listen to our patient, to learn about his or her local problem, where it is located and what triggers it.
- the patient’s health, that is overall health, any diseases and/or conditions, systemic medication, etc.
- the proper use of the appropriate diagnostic tools, including pulp testing, response to cold and hot, the bite test, radiographs and CBCT scans.
- additionally, the latest software can help us in reading and analysing the data that we have, including in 3D—i.e., recall the words of my radiologist professor, reminding us to study radiographs and be attentive to every small detail, not just look at them—rather, the logical connection between the patient’s account and history, the clinical findings and the imaging data—sometimes, putting the pieces of the puzzle together can be fast; sometimes, it may take longer.

Once the diagnosis has been established, the choice of treatment modality and selection of the best tools to perform the treatment follow. At this stage, focusing first and foremost on the patient’s health, it is important to choose the most effective and efficient treatment that would be as minimal as is practical and sufficient. The rest should be taken care of by Mother Nature.

Case presentation
Case 1
The first case that I would like to present was a referral patient. Sitting in the patient’s chair was an older man giving his account over the previous six months, he had twice travelled to somewhere in Asia for surgery on his left-sided submandibular lymph nodes (Fig. 6), which had apparently been swollen. Each time, pathology tests were clear of any cancer-specific markers. CT scanning and conventional radiographic assessment were conducted, with no findings recorded.

Having shared this, the patient reported that he felt his lymph node becoming swollen again, and he was anxious about this. His account was taken very seriously. Additionally, he reported that two of his mandibular premolars were aching, since root canal treatments had been started at a different clinic, but the dentist had been unable to finish them. With the patient’s permission, a new CBCT scan was obtained, and I asked the patient to wait for an hour to give me time to study it.

Judging by the general view first and then going into details, I realised that the two mandibular premolars were indeed in need of endodontic retreatment. However, knowing from clinical experience that premolars may have various clinical manifestations, I continued looking for other sources of potential problems, but without disregarding the premolars as the culprits (Fig. 2).

Analysing the CBCT sections, trying different filters and settings, looking at the mandibular molar with a large filling, and studying the bone around it, my eye caught something unusual. There was a small access migrating towards the internal angle of the mandible (Fig. 7) and creating an area of bone erosion (Fig. 8). This could be the pathology causing the patient’s suffering, in addition to the two mandibular premolars.

At this point, one might be happy with the diagnostic findings and race to treat the problems, affecting the mandibular dentition. However, still unsatisfied with the overall findings, I turned to analysing the maxilla, where I found that the second molar had internal decay and cerebral internal resorption, creating an infection pathway into the maxillary sinus (Fig. 4). I explained the situation to the patient and proposed re-treating the two mandibular premolars, as well as conducting primary root canal treatment on the mandibular molar and the mandibular molar. The patient agreed, and the four treatments were performed in one session, using the TF® Adaptive system (Kerr) for shaping and EndoVac (Kerr) for chemical preparation according to the “A” sequence of irrigation protocols followed by 3D obturation of the root canal system using the Elements Obturation Unit (Kerr: Fig. 5).

Anchors were prescribed for the patient to help his body combat the submandibular infection. Although I prescribed systemic antibacterial medication very rarely, I did so in this case because it was not clear what had happened with the lymph nodes and if they were still functional based on the immediate postoperative radiographs of the submandibular (Fig. 6) and the maxillary molar (Fig. 7). A minor postoperative reaction (moderate pain, no swelling) was observed and had completely resolved a week later.

Case 2
The next clinical case is somewhat similar and involved an extra-oral sinus tract (Fig. 8). A middle-aged female patient was referred to the office with an extra-oral fistula in the posterior submandibular area. According to the patient, she had had no pain or swelling and the fistula had appeared several weeks before she presented to the clinic.

At first, she thought it was a skin problem, but then realised that there was pus draining and the opening was growing larger. Upon consulting with a dermatologist, who said the problem was most probably of dental origin, the patient consulted her dentist, who had previously placed an implant for her. The dentist thought the infection was associated with her third molar and not the implant, and suggested extraction of the tooth. The patient wanted to retain the tooth and hence sought an endodontic consultation regarding this option.

A new CBCT scan (i-CAT, Imaging Sciences International) confirmed that the third molar had an internal sinus tract, which had created the fistula. This could be solved by root canal treatment on the molar, followed by a crown and follow-up treatment, with a good prognosis for overall long-term success. The patient was happy to hear that and requested treatment as soon as possible.

The root canal was treated (Fig. 10), using the TF® Adaptive system for shaping and EndoVac for chemical preparation according to the “A” sequence of irrigation protocols followed by 3D obturation of the root canal system using the Elements Obturation Unit (Fig. 5). Follow-up records were taken (Figs. 11 & 12), with radiographic control to check for bone healing and external facial photographs to compare. The patient was extremely satisfied that her molar could be preserved.

Conclusion
These clinical examples illustrate the importance of diagnosis as the main piece of the puzzle: the importance of “finding it.” Today, the state-of-the-art approach in endodontics requires the use of sophisticated equipment and software to complement the expertise and experience of the endodontist.
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References
[1] “Find it, fix it, and leave it alone”—an axiom attributed to Dr Andrew Taylor Still, the founder of osteopathy, and recorded by his students and followers.
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