To scan or not to scan, is that the question?

In 1996, I was honoured to have been invited to present at the first joint meeting of the European Association for Osseointegration and the Academy of Osseointegration held in Amsterdam in the Netherlands. At this meeting, I presented on the use of CT for the diagnosis and treatment planning of dental implants. A novel concept at the time was to create a radiopaque scanning or scannographic template to identify the tooth position in relation to the underlying bone. This template was fabricated prior to the scan and was worn by the patient during the scan acquisition. In the mid-1990s, we did not have virtual teeth and could not create a virtual occlusion, or import an optical scan of a stone cast, and therefore the information received was invaluable and provided the necessary information to plan for restoratively driven implant reconstruction. The industry was just then integrating the necessary software tools to choose implant sizes (diameters and widths) as positioned within the available bone of the receptor site, and then to simulate the abutment projections that would link the proposed implant to the radiopaque tooth incorporated in the scannographic template. Therefore, 18 years ago, it was suggested that to achieve the most from the scan, advanced planning and extra steps were needed to fabricate a scan template prior to the actual scan. At that time, we had to send our patients to a radiology centre or a hospital for the CT scan, at a high cost per scan. This created several barriers to the use of the technology.

With the introduction of CBCT devices during the past decade, most barriers to acquiring the scan have been diminished. In the normal course of diagnosis and treatment planning, we now have a much lower radiation dose to work with. With many devices, we have the ability to collimate the image (field of view) to further reduce exposure to the patient, and we can even obtain a full diagnostic image with a scan time of less than five seconds with the newest devices!

However, with these advances, several questions come to mind. Are we getting the most from the scans that are acquired each day? Are clinicians spending the extra time with pre-surgical planning steps to fabricate scanning templates and diagnostic wax-ups, or using fiducial markers when appropriate? Have these protocols been incorporated into everyday practice now that CBCT devices are so predominant, and who is providing these extra services? Are we using the software tools to their full potential to diagnose and treatment plan with the highest degree of accuracy? Our new digital workflow may need to start sooner than we think, indicating a paradigm shift that may include intra-oral optical scanning, desktop scanners, associated software applications, and collaboration with dental laboratory technicians who are quickly adapting to this technology.

It is my personal hope that clinicians will read about the latest state-of-the-art uses of the technology for a variety of different treatment modalities within the pages of our new cone beam International Magazine. It is through further education that the questions above will be answered, as we all learn from our combined experiences to obtain the most diagnostic information from each CBCT scan. Our patients are counting on it!

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