Possibilities and risks of digital techniques in implant dentistry

An interview with Dr Margareta Hultin, a senior lecturer at the Department of Dental Medicine at Karolinska Institutet in Stockholm in Sweden

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Implant dentistry is constantly advancing. New research results, the rapid development of digital technologies and increasing experience in clinical practice change the way implantologists work. This may lead to a rethinking of already established treatment approaches. In the “Things we stopped in our practice due to failures” session, the 2016 congress of the European Association for Osseointegration (EAO) will address this topic, evaluating the possibilities and risks of certain treatment protocols. DTI had the opportunity to talk to one of the session speakers, Dr Margareta Hultin, about her topic of immediate CAD/CAM restoration and recent developments in implant dentistry.

Dental Tribune International: Dr Hultin, how has implant dentistry developed in recent years, and what new insights have changed the way implantologists work?

Dr Margareta Hultin: Implant dentistry has developed in several areas in recent years, such as grafting and augmentation procedures, as well as treatments for optimising and predicting the aesthetic result after rehabilitation. On the one hand, improvements in implant treatment can be attributed to a better understanding of how both the hard- and soft-tissue anatomy—for example, the role of thickness, width and positioning of keratinised tissue—influence the long-term outcome and aesthetic result. On the other hand, 3-D radiographic imaging techniques have greatly improved individual assessment of hard tissue with regard to jaw anatomy and bone volume in treatment planning.

Digital dentistry is increasingly relevant in dental practice nowadays. How has digital technology changed implant dentistry, and what are its main advantages?
Digital technology can support dentists in several steps of restorative treatment, from cone beam computed tomography and the virtual planning of implant positions through to prosthesis manufacture for immediate function. Also, virtual planning can be transferred to the actual clinical setting by fabricating surgical guides for flapless implant placement.

The main advantage of digital techniques is the ability to plan and optimise the positioning of implants in a prosthetically driven manner. Moreover, computer-guided techniques can help decrease postoperative discomfort and allow immediate function, as they enable implant placement with minimal surgical trauma. In addition, these techniques can offer a useful alternative to bone augmentation in severely resorbed jawbone, as they facilitate optimal positioning of implants in the available bone.

In your lecture at this year’s EAO congress in the “Things we stopped in our practice due to failures” session, you discussed immediate CAD/CAM restoration. What are potential complications of immediate CAD/CAM restoration, and why is this treatment approach prone to failure?

Although computer-guided techniques for implant placement can offer advantages for both the dentist and the patient, guided implant surgery is technically demanding and not free of specific procedure-related complications. For example, the drilling template may fracture or there may be complications related to limited access and visibility when using a flapless approach. This can lead to deviations in implant positioning and ultimately a poorly fitting prosthesis. Moreover, high aesthetic demands may be difficult to completely foresee, since computer-guided implant positioning carries the risk of overlooking the ideal location of an implant with regard to the soft tissue. Therefore, the skills and experience of a clinician who wants to use these techniques need to go far beyond those necessary for regular implant surgery.

What alternative treatment protocol do you recommend for less experienced clinicians?

A good option is to use digital techniques for implant placement in combination with traditional protocols for prosthesis manufacture. For example, a template-guided flapless surgery for implant placement can be combined with a traditional protocol for unloaded healing and the fabrication of a permanent prosthesis.