A Continuing and Emerging Diagnostic Problem

As an early adopter of computerized tomography (CT) technology in 1989, I feel compelled to speak out on what I believe to be a continuing and also an emerging dental problem. It is important to protect patients in need of complex implant/prosthetic treatment from the lack of treatment planning as well as inadequate planning with its untold results. It is important to emphasize the use of traditional prosthetic principals and materials as well as digital technology for treatment success. There is need for professional support and ethical leadership from the College, for the use of virtual implant surgery and from the pressures of misguided but highly motivated businesses to develop treatment plans from CT or cone beam computerized tomography (CBCT) scans for a patient's implant/prosthetic treatment, without adequate participation by treating dentists. I ask the following: "Currently, is there a continuing lack of adequate clinical planning for patient implant/prosthetic treatment? Are there emerging businesses arising to supply the diagnosis and treatment planning from CT or CBCT scans?" In my opinion, there are both, and this involves the lack of preoperative virtual surgery by clinicians and promotion to clinicians of digital technology, as a substitute for training, planning, and sound clinical judgment, with a reliance on third-party planning.

To complete a complex implant/prosthetic diagnosis with interactive patient planning and to complete the treatment plan, (place implants and prosthetics) with predictable results, it is essential to have three-dimensional (3D) radiographic visualization of the implant site(s), with a patient-acceptance prosthesis, surgical template, or guide besides the traditional diagnostically mounted casts, radiographs, and digital pictures. Bone donor sites also can be evaluated with digital technology, if autogenous bone blocks or membrane or sinus grafting are needed for functional and esthetic implant treatment planning. The use of advanced dental imaging, CT or CBCT, and implant interactive software for implant planning and placement are essential for successful treatment outcomes. The question is who is doing the planning, constructing the patient-acceptance prosthesis and surgical guides, verifying the positional accuracy of the diagnostic prosthesis, and determining the type of surgery and validity of the radiographic scan.

One of the greatest and necessary advantages of pretreatment planning software is the "virtual surgery" created from the dicom file of the CBCT scan with its 3D radiographic model and cross-sectional oblique views, which precedes the actual clinical treatment and eliminates the need for last-minute decisions. The actual surgery time is usually decreased because the surgeon has gone through all surgical steps of the virtual surgery, including an active role in the construction of the patient-acceptance prosthesis and surgical guide(s), so the treatment results are routinely consistent with the treatment planning. Thus, virtual treatment planning and computer-generated drilling guides benefit the patient by allowing flapless surgery, reduced surgical time, reduced discomfort and swelling, and faster recovery time. The virtual surgery aids the surgeon by reducing chairtime, stress at the time of surgery, and potential surgical complications. It also facilitates an accurate means of placing dental implants according to a predetermined prosthetically driven treatment plan. The implants can be treated as two-stage, single-stage with healing abutments, or as one-stage surgery with an interim prosthesis.

It is my belief that the College needs to provide professional leadership and develop a policy statement on clinician involvement on such matters. In the final analysis, we have an opportunity to deliver complex treatment that is very accurate or that is marginal.

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