

3D DIGITAL IMPLANT USING CBCT, INTRA ORAL SCANNER AND 3D PRINTER

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Most of the current implants have been subjected to surgery by relying on the manual operation of the surgeon by establishing a diagnosis and treatment plan using two-dimensional x-ray and 3D CT. And taking impression for prostheses are being applied to the implants thus placed (called analogue implant). The completeness of surgery and prostheses varies greatly even if the procedure is performed by the same dentist, and the results will be different depending on the skill or experience of the dentists and the doctor's conditions of the day (called analogue implant). The author would like to introduce a most accurate system that allows doctors to easily perform surgery and prosthodontics by combining the CBCT, intra-oral scanner, CAD-CAM machines and 3D printer. First, we obtain all the information and the 3D anatomy by merging the CT and intra-oral scanned three-dimensional virtual images. Before operation, CAD (computer aided design) software, such as implant studio and dental manager (three shape), is used to complete the entire operation simulation and prostheses design (3D virtual design of implant placement and prosthesis) and then fully surgical guide and provisional crown and bridge are manufactured by CAM (computer aided milling) and 3D printer. If the implant fixtures simulated are reproduced to the patient's mouth by fully guided surgical guide, pre-fabricated prostheses will be mounted within the clinically acceptable error range. To precisely reproduce the implant position 3-dimensionally at the time of surgery, we use a simulated digital data to fabricate a fully surgical guide, and fabricate abutments, crowns and bridges. After this preparation, the operation is carried out and the prosthodontic work is also immediately loaded (called 3D digital implant). If the position of the implant in the 3D-simulation cannot be accurately reproduced in the patient's mouth, the pre-fabricated prosthesis will never fit well. The overall error is affected by precision of CT, oral scan, milling machine, 3D printer and several soft-wares. All procedures of fully guided implant surgery and prosthodontics are completed easily, accurately and comfortably to the patients and doctors. With this system, the author would like to introduce how to complete surgeries and prosthetics in difficult cases. The author wants to introduce a fully guided implant system with highly precision. In addition, the author introduces the CAD-CAM-PRINT system which produces the whole process in office.