

I-physio profile designer concept: How to avoid conventional impression



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Abstract

Objective: Present a new technique réduction the clinical steps of implant placement and impression for crown on implant. Develop the concept of gingival sculpting with I-physio healing abutments.

Methods: This case presentation shows how to use the new concept of I-physio profile designer abutment to shape the gingiva during healing and use this abutment for impression before placing the final crown.

Results: This simplified procedure shows that I-physio profile designer abutments reduce the clinical and prosthetic steps in implantology.

Conclusion: In the future, implantology and prosthodontics on implants will certainly benefit from this technique and improve the long-term results for the patients.

Keywords: Immediate placement of implant, Implantology, I-physio profile designer abutment, Optical impression.

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Introduction

Numeric impression is a key evolution in dentistry, be it on natural teeth or in implant dentistry.

This evolution makes obsolete the conventional techniques using materials like silicones, plaster etc., as can be needle implants or Linkow blades.

The recent techniques using scan body or healing abutments with a notch (Biomet 3I Encode system), can be considered as incomplete because they are not close to the anatomy of natural teeth [figure 1A](#) and [figure 1B](#).¹

A recent approach has been proposed by a french company: ETK, both simple and quality based: the I-physio profile designer concept. This system answers to many problems related to prosthodontics and biology.

The concept is based on the following principles: A tooth is not round as healing abutments are; epithelial cells and hemidesmosomes are part of the periimplant biological space; damaging or tearing them every time we unscrew and screw back the healing abutment may damage the implant sulcus and compromise the stability of the periimplant tissues.¹⁻³ The insertion of prosthodontic elements placed on bone-level implants can be delicate or painful for some patients.

To avoid these problems the solutions proposed are: to place at the time of implantation (one-step surgery) or at the time of exposure of implant (two-step surgery) a healing abutment whose anatomy is close to the emergence profile of the tooth that has to be replaced [figure 1C](#). The second idea is to register with a computerized image the position of the implant with respect to the tissue structure,

registering the spatial position of this healing abutment. Once osseo-integration is completed, a numeric registration of this healing abutment is realized without removing it.

An STL file is sent through Internet to the lab technician, who will use a milling machine to manufacture the crown or the bridge. This can done on a standard or customized abutment. This technique has other advantages, like immediate esthetical placement of the crown which becomes safer and easier. A clinical case is presented which demonstrates this technique using the I-physio concept.

Case Report

Mister C., 62 years-old, comes consulting because of pain and mobility of tooth 12. The medical questionnaire mentions that the patient is HIV+. Intra-oral examination shows that tooth 12 is wearing a coronal reconstruction with a ceramic crown fused to metal [figure 1D](#), placed on a casted inlay-core.

The prosthodontic element is loose, a crack is visible on the root. Probing shows a root fracture.

Different treatment plans are proposed, the patient chooses the extraction and immediate placement of an implant.

The placement of the implant is scheduled without a flap elevation with a surgical stent. The OXZ file coming from a numeric impression of the upper arch with a 3D shape camera and the DICOM file from the CB-CT (OP300 instrumentarium) are combined [figure 1E](#). This allows the planification of the case [figure 1F-figure 1H](#) and modelization of the surgical stent using the software «implant

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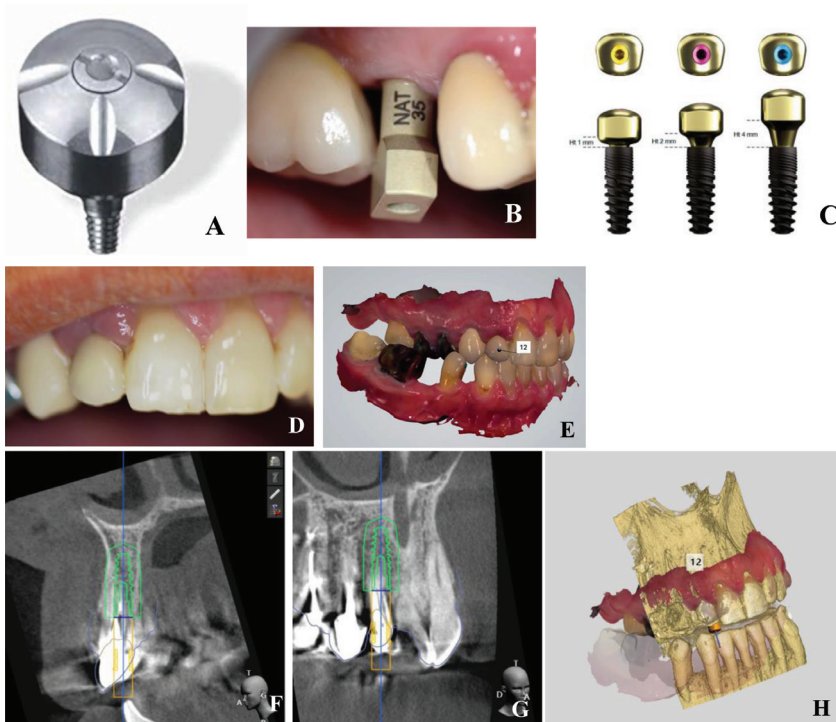


Figure 1 A. Implants, B. Biomet 3I Encode system, C. Implant Ht 1 mm, Ht 2 mm, Ht 4 mm, D. Intra-oral examination, E. DICOM CB-CT (OP300 instrumentarium), F. The planification of the case, G. Modelization of the surgical stent using the software, H. 3D FormLab printer

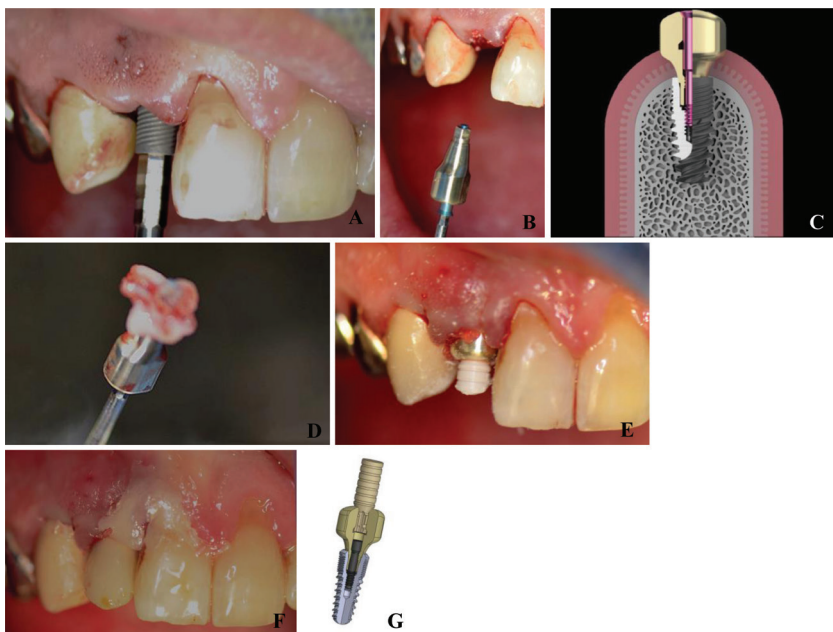


Figure 2 A. The long screw, B. The short screw, C. Screw 3D, D. Healing abutment, E. The post is adjusted according to the occlusal space, F. Temporary crown is fabricated with the molding that registered, G. The I-physio abutment

studio». This guide is printed in the dental office with a 3D FormLab printer.

The surgery is performed in a specific surgical room respecting the usual conditions of asepsis for the placement of dental implants. The tooth is extracted without flap elevation thus preserving the cortical bone. The surgical stent is then inserted and his adjustment checked thanks to lateral windows.

This is a simplified guided surgery, i.e. only the 2.2 mm drill is used with the stent; other drills are used the conventional way.

A Naturactis implant 3.5 x 10 mm (ETK) is inserted with a couple of 40N/cm [figure 2A](#).

The buccal gap between bone and implant is filled with deproteinized bovine bone (Creos® by Nobel Biocare®). It has a low resorption rate and a good biocompatibility. It is usually recommended to fill this implant/bone gap on the buccal side when it is more than 2 mm, thus maintaining a primary stability and reducing the risk of epithelial invagination.⁴

The I-physio Profile designer is trans-screwed on the implant and a PRF membrane is placed (double thickness, trans-screwed by the healing abutment, covering the biomaterial and the implant) [figure 2B-figure 2D](#).

The long screw of the healing abutment can be replaced by a shorter one, allowing the insertion of a clipped post in the I-physio abutment. The post is adjusted according to the occlusal space [figure 2E](#) and a temporary crown is fabricated with the molding that registered the shape of the lateral incisor before extraction [figure 2F](#) and [figure 2G](#).

This temporary crown is removed from the I-physio abutment and adjusted, avoiding any contact during the occlusal movements, polished and placed back into position. Un CB-CT is made to control the positioning of the implant [figure 3](#). Post-op instructions are given to the patient. In particular, he is informed that this tooth is not in function.

An appointment is scheduled 3 months later. Three months after implantation, Mister C. comes back to the dental office. The temporary crown has been submitted to strains, but the clipped post has accommodated them. If the strains are too important, it will clip off, acting as a fuse.

The patient has some difficulties controlling the biofilm and a slight inflammation of the marginal tissues is noted. Still, using a Titanium healing abutment has reduced this inflammation compared to a conventional resin temporary tooth.¹⁷

The temporary tooth is removed clipping it off, the I-physio is cleaned but not removed and a

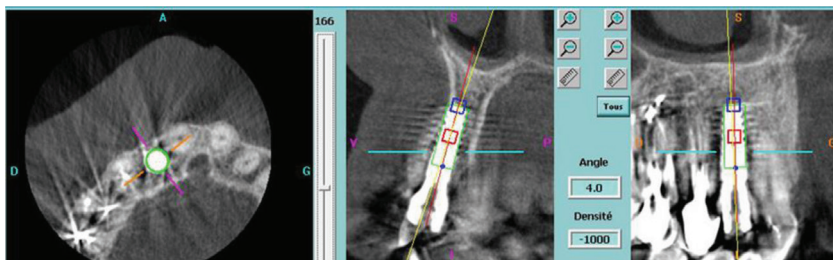


Figure 3 Un CB-CT is made to control the positioning of the implant



Figure 4 A. Intra-oral scanner 3 shape, B. Vitro-ceramic disk with lithium disilicate, C. E.MAX



Figure 5 A., B., C. X-Ray is made to check the perfect adjustment, D. The patient can smile again with a natural smile

numeric impression is performed with the intra-oral scanner 3 shape. The temporary tooth is changed.

The new file is sent to the lab technician through Internet [figure 4A](#). The crown is done using tooth 22 as a mirror image for 12, using a vitro-ceramic disk with lithium disilicate (E.MAX).

A few days after, the prosthesis is sent to the dental office. The tooth is delivered without a model [figure 4B](#) and [figure 4C](#) but a printed model can be realized. Iphysio Designer is removed once only, on the day of placement of the crown.

The shape of the crown is totally homothetic with the morphology of the soft tissues around the abutment, thus allowing a placement without

any pain [figure 5A](#) and [figure 5B](#). The connexion between the Naturists implant and the abutment is a cone morse, but still an X-Ray is made to check the perfect adjustment [figure 5C](#). The patient can smile again with a natural smile [figure 5D](#).

Discussion

As soon as 1975, François DURET has published the principles of numeric registration and milling of prosthodontic elements (<http://www.francoisduret.com>).

Nowadays these numeric techniques are reliable for restorative dentistry up to 3 to 5 elements.⁵ The milling of prosthodontic elements and 3D impression of surgical stents at the dental office allows the clinician to go through total numeric steps. Postoperative conditions are optimal^{6,7} and the surgeries are performed with more precision.⁸

Numeric impression and reconstruction bring satisfaction to the patient, avoiding conventional impression with intra-oral materials⁹ and allow painless placement of prosthetic elements: these are perfectly homothetic with the peri-implant tissues. Moreover, this technique contributes promoting the dental office and allows a fast realization of the prosthetic elements.^{10,13}

The clinician will appreciate the quality of adaptation of the prosthetic pieces.¹² Using numeric technology make the different steps less clinician dependent.

Impression numeric techniques with scan body have been long described.¹³ Some of them however make necessary several screwing and unscrewing of the healing abutments or do not have an anatomic shape. The more manipulations, the higher the risk of damaging the peri-implant tissues.¹⁻³

Using I-physio abutments allows a perfect esthetic and biological integration of our prosthodontic elements on implants.

Numeric approach of impression and prosthodontics fabrication reduces the cost.¹⁴ gain of time, no transfer needed, no implant replica.

On a long-term basis the absence of cement reduces the prevalence of peri-implantitis.¹⁵ In a similar way, this technique limits the bacterial contamination of peri-implant tissues related to repeated manipulation of healing abutments.

It is a simplification for the referent clinician, as it is easy to handle. The clinicians who do not have a numeric camera can make a conventional impression with silicone material, then the lab technician will scan the model and the placement of the prosthodontic element will be performed the same way as explained before.

Conclusion

Using numeric impression is becoming part of daily practice. It increases the quality of prosthodontics on natural teeth and implants. Still, the quality of the final ceramic requires a good lab technician.¹⁶

The I-physio profile designer concept is a response to the demand for quality, comfort, esthetics, rapid treatment and long-term reliability coming from the patients.

As a consequence, this concept brings a stressless relation with our patients and the lab technician, with a fast learning curve., both for the generalist and the specialist.

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Conflict of Interest

The authors report no conflict of interest.

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