

# Creating a harmonious emergence profile on single unit implant-supported restorations – a clinical report

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## Introduction

Single unit implant-supported restorations can successfully restore edentulous spaces, this therapeutic method being accepted by patients due to the conservative attitude towards neighboring teeth and, at the same time, having good long-term results, as shown in the literature. On the other hand, this type of restoration is a challenge for the clinical team because: i) patients have higher aesthetic requirements than in the past, ii) white (restoration) and red aesthetics (gingiva) contribute equally to the final result and the acceptance by the patient, iii) unlike the extended edentulous spaces, the ones corresponding to a single tooth offer limited space, so that the correct implant positioning is determinant in fulfilling the above requirements. The emergence profile of the implant crown influences its form thus the aesthetics, the gingival integration and the ability of the patients to maintain a proper oral hygiene. We are presenting a clinical case with a new method for obtaining a favorable emergence profile in single unit implant restorations.

A 39-year-old male patient came to our practice seeking for prosthetic treatment for the edentulous areas. In the preliminary discussion he mentioned he would prefer implant-supported restorations. The clinical examination revealed no pathological medical history and the absence of the teeth 14, 15, 25, 26 and 36. The limiting teeth were caries-free or had minor direct restorations (16, 27), and 27 was mesial tilted so that the edentulous span was reduced to a premolar (Fig.1 and 2).



Fig. 1



Fig. 2

In order to have a 3D image of the available bone, the patient was referred for a cone beam computed tomography examination (CBCT), and for an optimal planning of the case, an intraoral scanning of both dental arches was performed using a Medit i500 scanner (Medit Corp., Korea).

The options for prosthetic treatment would have been two conventional fixed dental prostheses, a resin retained fixed dental prosthesis on the left side or fixed prosthetic restorations (crowns) with implant support. All the possibilities, including their advantages and disadvantages, were presented to the patient and he was in favor of the implant restorations because of the conservative approach

regarding the existing teeth. The patient also refused orthodontic treatment to correct the tooth alignment problems.

### Digital planning of the case

Using exocad software (exocad, Germany), we combined the CBCT data with the STL files from the intraoral scanning and we were able to do a digital wax-up and according to this to simulate the implant positions. At the end of this planning stage, we printed the models and the orientation guide, which facilitates the insertion of the implants in a prosthetic-driven approach (Fig. 3-8).

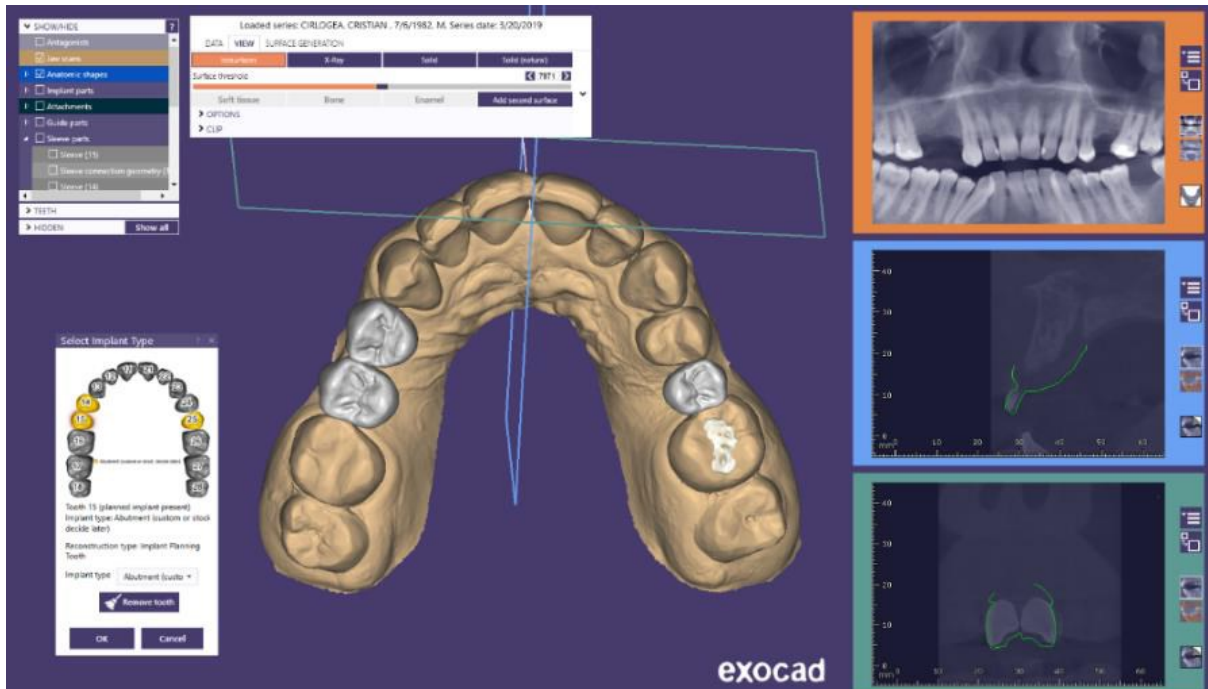


Fig. 3

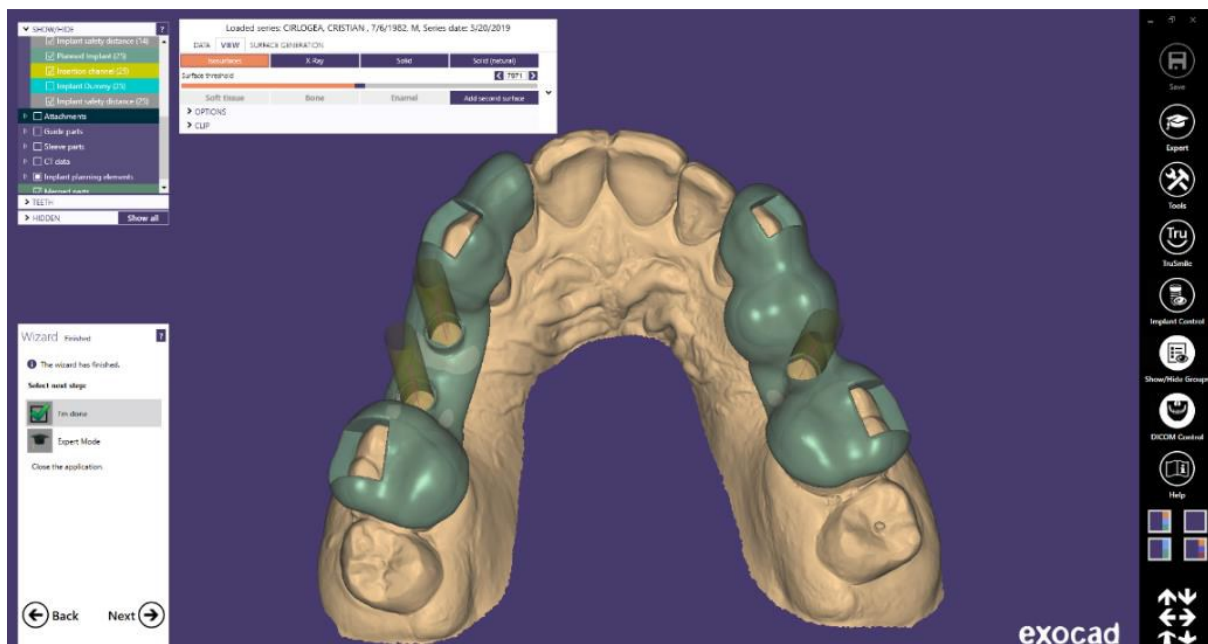


Fig. 4

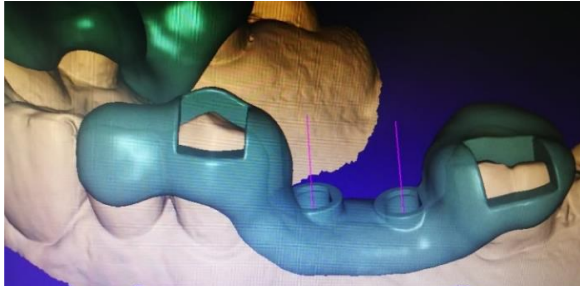


Fig. 5

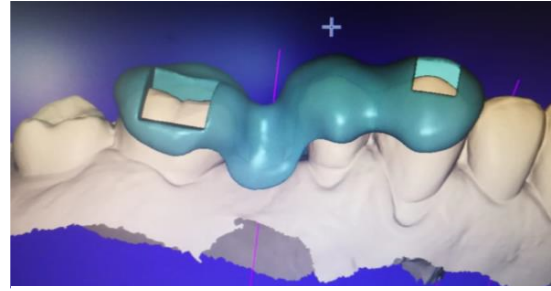


Fig. 6



Fig. 7



Fig. 8

### The surgical phase

The surgical phase consisted of preoperative preparation, local anesthesia and the insertion of three implants for the teeth 14, 15 and 25: Naturall + 3.5 / 12mm, Naturactis 3.5 / 10mm and Naturactis 4 / 10mm, respectively (Fig.9, 10), produced by Euroteknika (France).

The transgingival healing technique was used with the help of iphysio healing abutments (Euroteknika, France). These represent an innovation, which facilitates both the postoperative tissue recovery and the conformation of a favorable emergence profile (Fig.11). There are different dimensional options that can be used for incisors, canines, premolars and molars, respectively. All of the healing abutments were checked not to exert excessive pressure on the gingiva, which could jeopardize the remodeling, and not to affect the patient's occlusal contacts.



Fig. 9

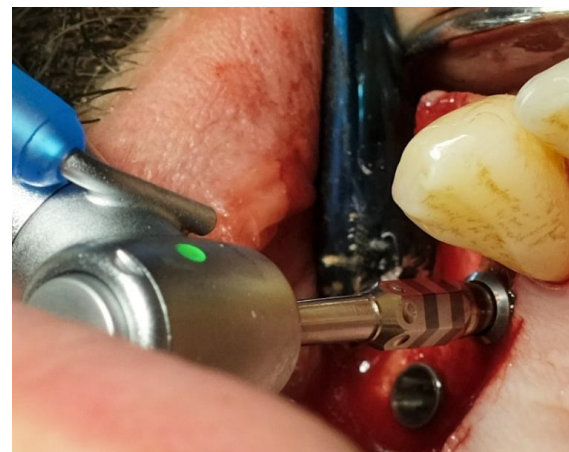


Fig. 10



Fig. 11

The optimal outcome of the surgical stage was also confirmed with the help of an orthopantomogram (Fig.12).



Fig. 12

When the sutures were removed, the iphysio abutments on the right side were replaced with ones with optimal dimensions in order to create an emergence profile specific to the maxillary premolars. The images below show the postoperative status 12 days after surgery.

The healing stage after the surgery went free of complications, and one can see the healing aspect of the attached gingiva at about three and a half months. At the same time, the conformation of the emergence profile and the harmonious gingival architecture can be observed.

The innovation represented by these healing abutments is that they were also designed as scanning abutments, because they have elements on their surface which facilitate the indexing in the CAD software. The iphysio exist in the 3Shape software (3shape A/S Denmark) or **exocad** software (exocad, Germany) virtual library, so that the restorations could be designed directly after the intraoral scanning (Fig. 13)

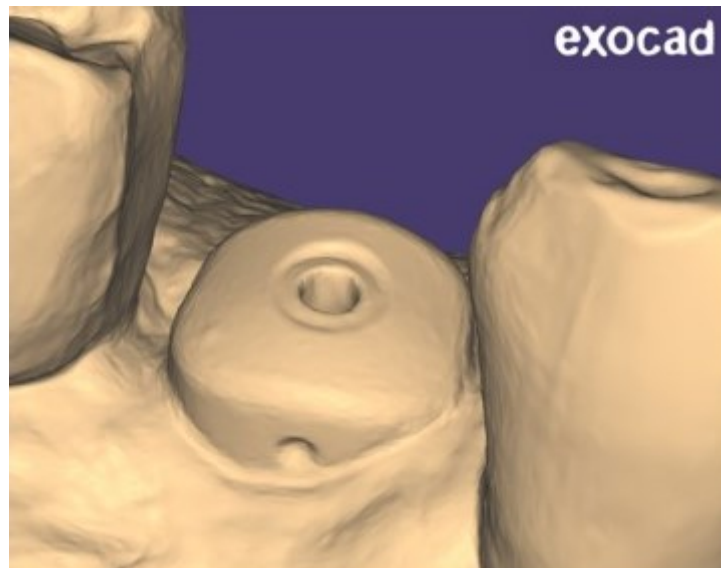


Fig. 13

### **The restorative phase**

In our clinical situation, the design of prosthetic restorations was made in the **exocad** software.

The following step was the design of the prosthetic abutments. The optimal shape of the gingival contour obtained in the healing phase facilitated the creation of prosthetic abutments with anatomical shape and later of the crowns with a harmonious emergence profile.

On the right side, hybrid individual crowns were made: custom prosthetic abutments were designed, then the crowns with occlusal cavities (Fig. 14), which were cemented in the laboratory with Panavia cement (Kuraray Noritake).

For the left side (25), an individualized prosthetic abutment was chosen for a cemented monolithic zirconia crown (Fig. 15).

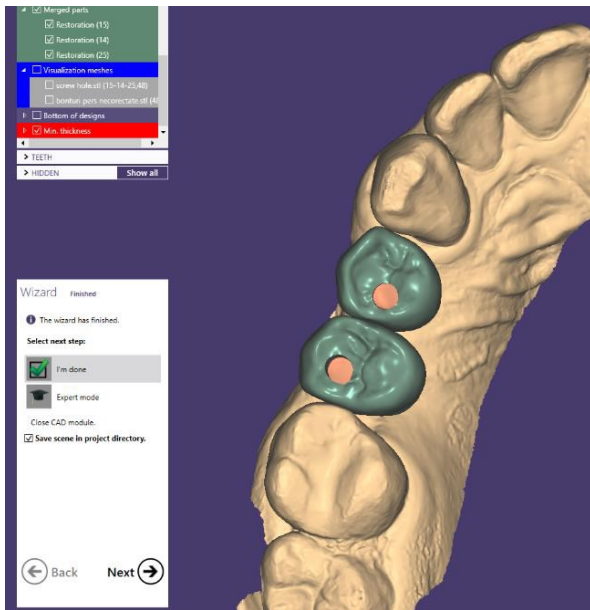


Fig. 14



Fig. 15

The next clinical stage was the try-in and adaptation of prosthetic abutments and crowns. After removing the iphysio, the prosthetic abutment and the crown 25 were inserted and the crowns 14, 15 were screwed on, respectively. The insertion was checked, the excess areas were marked with articulating paper, so that a proper insertion of the crowns was obtained.

Care was taken to ensure that there were no areas of excessive pressure on the periimplant gingiva. Afterwards, the static occlusal contacts were checked and marked in the maximum intercuspation position and the premature contacts were removed in order to have stable and simultaneous contacts on all teeth. Subsequently, the presence of interferences during protrusion and laterotrusion was checked to avoid unfavorable lateral loads. In the end, the aesthetic appearance of the crowns was observed together with the dental technician and small color changes were decided according to the patient's wishes. Finally, the crowns and abutments were removed and the iphysio were reinserted.

After making the final changes in the laboratory, the intraoral insertion of the restorations followed. The crowns 14 and 15 were screwed into the implants and the prosthetic abutment 25 at 25 Ncm, according to the manufacturer's recommendations. The crown 25 was cemented with temporary cement (Temp Bond NE, Kerr), and the access cavities were filled with Teflon and light curing composite (Filtek Ultimate, 3M Espe, USA). The contact points, the periimplant gingival area, the occlusal contacts and the aesthetic appearance were checked again, all the elements being confirmed by both the doctors and the patient. The final restorations are shown in the following images (Fig.16 - 20).

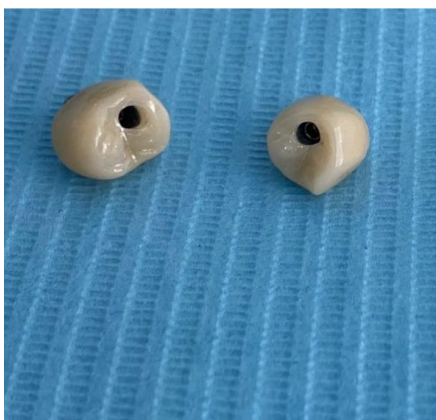




Fig. 16 - 20

The patient was further scheduled for monthly prophylactic check-ups according to the recall protocole. The images below show the appearance of the crowns 3 months after insertion, the normal and harmonious clinical appearance of the gingiva in terms of its position, color, texture and absence of signs of inflammation (Fig. 21 - 22).



Fig. 21



Fig. 22

## **Conclusions**

Although considered "simple cases" in daily practice, the single unit implant-supported restorations represent a challenge because of the peculiarities presented in the introduction and the reduced possibilities of correction. Hard and soft tissue integration, patient satisfaction, and the long-term success of restorations are based on a proper examination, planning and execution of the clinical case and on teamwork of the patient, oral surgeon, restorative dentist and dental technician. In all the above-mentioned treatment phases, the digital technology offers valuable assistance by enabling the integrated workflow in a prosthetic-oriented approach.

In the clinical case presented, the patient received implant crowns whose emergency profile, an important factor in the treatment outcome, was optimized using an innovative method, the iphysio healing abutments (Euroteknika/France). These components not only facilitate the soft tissue healing, but also support the conformation of the emergence profile starting from the day of the surgery. We further aim to monitor this patient and validate this method in other clinical cases.

## **Acknowledgements**

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