

CASE REPORT

IMPRESSION TECHNIQUE FOR BOTH IMPLANT AND NATURAL TOOTH: A CASE REPORT

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ABSTRACT

Objective: Impression for implant restorations is usually taken in one-step. It traditionally requires the use of impression copings, analogs and laboratory components. On the other hand, two-step impression technique is commonly used for making impressions in conventional fixed dental prosthesis. To capture the position of implants and to record fine details of the prepared tooth simultaneously, few techniques have been described in the literature. The aim of this report is to describe one-step impression technique for both implant and natural tooth simultaneously using a customized implant impression coping and an acrylic resin tooth coping.

INTRODUCTION

Impression in implantology requires much less precision in recording the details than the impression of prepared teeth. Recording the precise position of the implants and transferring it to the master model is an essential condition to obtain an accurate superstructure with passive fit. In the esthetic region, we also need to capture the soft tissue around the implant at the same time by using the provisional restoration (Tsai, 2007). A custom impression coping is obtained, by recording the emergence profile from provisional restoration. The final restoration should support by its contour the profile created by the provisional and preserve the stability of soft tissues (E. Grizas, 2018). Impressions for implant fixed restorations are usually taken in one-step (putty and wash impression materials used simultaneously). Two-step impression technique (the putty-body impression first and then the wash stage by injecting the light-body) is commonly used for making impressions in conventional fixed dental prosthesis (Patil, 2015). During the impression-making process, it may be difficult to obtain a good impression of the tooth margin preparations simultaneously with a good implant impression. Indeed, fine detail reproduction and dimensional fidelity are required for the impression of tooth preparation (Chee, 1998). It is advantageous to use a light-body elastomeric impression material that has the consistency and flow to record the margins and fine details of prepared tooth. A light-body material is usually injected around the tooth preparation with impression syringe (Chee, 1998).

In our clinical situation, one-step impression technique modified by using a customized implant impression-post and a tooth impression coping were used to take an impression of an implant and a prepared tooth simultaneously.

Clinical Case

To ensure an esthetic restoration, two provisional restorations were fabricated to pattern the soft-tissue around the tooth and implant and to allow peri-implant soft-tissue stability (Figure 1).



Figure 1. The soft tissue contour as established by the provisional restorations

The final impression was made after the soft tissue contour has matured, and the desired emergence profile was reached (Figure 2). First, the provisional restoration was connected with an implant analog (Figure 3). The assembly was fitted into a mold filled with silicone material up to the level of the provisional crown's maximum circumference.



Figure 2. Occlusal view of the natural emergence profile after removing the provisional restorations

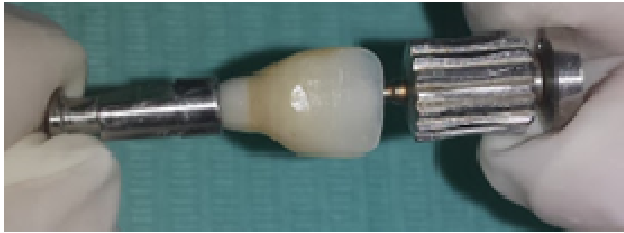


Figure 3. Provisional restoration that recreate a natural emergence profile assembled with implant analog

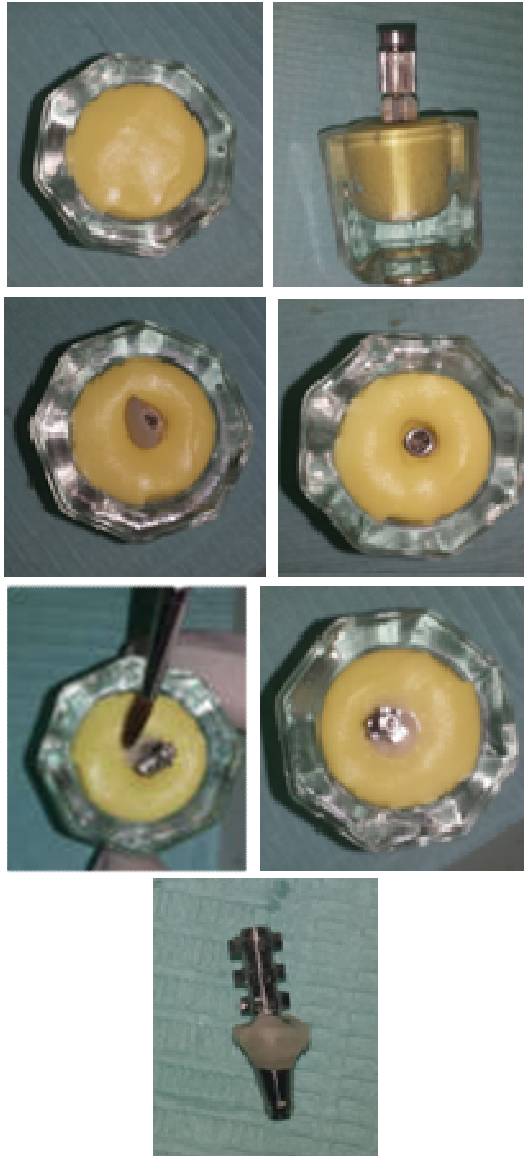


Figure 4. Transferring the emergence profile of the provisional by making a customized impression-post



Figure 5. Implant impression-post and tooth impression coping are customized with acrylic resin



Figure 6a. Open tray impression technique



6b. Unscrewing the impression coping

When the silicone has set, the provisional restoration was removed, and an impression post was connected to the implant analog. The discrepancy between the round impression post and the silicone walls of the block was filled with acrylic resin (Unifast; GC Company, Tokyo, Japan) that created a customized impression post (Figure 4). After removing the provisional restoration from the tooth preparation, a tooth coping was made intraorally with acrylic resin and then

perforated with a bur (Figure 5 a, b). A conventional one-step impression technique was made with a dimethyl siloxane material using open tray technique. Heavy-body impression material was placed in the open tray. The light-body impression material was injected around the customized impression-post and the tooth coping filled with impression material was seated on tooth preparation. Excess material escaped through the perforations and along the margins. After setting, the impression-post was unscrewed in the usual manner and we removed the impression out of the mouth (Figure 6 a, b). After the connection of the implant analog into the customized impression post (Figure 7), the simulated soft tissue material was added around the implant analog transferring the ideal soft tissue profile then the impression was poured in order to produce the working cast (Figure 8). The shade was selected and the all ceramic crowns were fabricated (Figure 10) and then cemented on the tooth and the implant abutment (Figure 11).

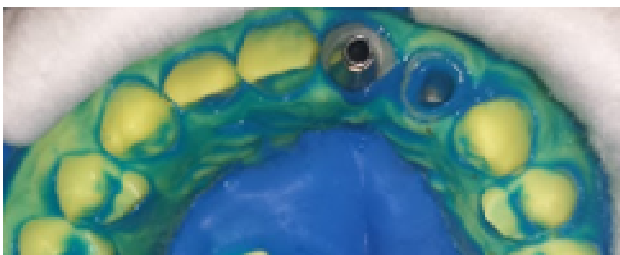


Figure 7. Definitive impression with implant analog connected into the custom impression-post and the tooth coping in place

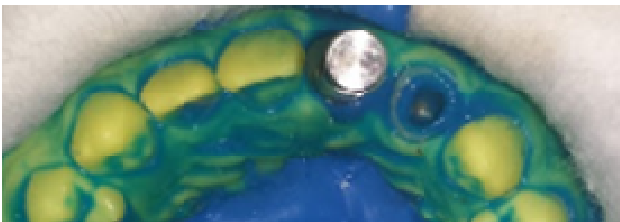


Figure 8. Soft tissue cast reproduced around implant



Figure 9 a. Fabricating a positioning index



Figure 9 b. The positioning index on the working cast



Figure 10. Occlusal view of the definitive zirconia crowns on the cast

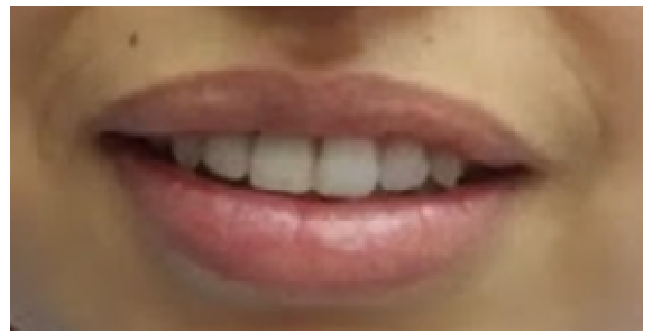


Figure 11. Ceramic restorations after cementation

DISCUSSION

The impression process for fixed prosthodontics requires careful management of the soft tissue. The tissue has to be retracted to expose the finish line for making impression (Benson, 1985). There are few studies in the literature on mixed impressions involving natural teeth and implants. Kutkut and al describe an implant-abutment level impression technique simplifying the dental implant restoration by reducing armamentarium through incorporating conventional techniques used daily for crowns and bridges (Kutkut, 2016). The technique used in this article allows to be more efficient by working with a single cast in the laboratory and so makes it easier to match and blend the restorations of tooth and implant for optimum esthetics (Chee, 1998).

The difficulty in obtaining an acceptable impression by capturing the uninterrupted finish⁷ line during the final impression process increases for natural tooth because tissue fluids and saliva must be controlled while a free-flowing impression material is simultaneously injected. The advantage of this impression procedure is that the custom-made coping facilitates adequate access to the tooth preparation without interference of implant impression-post. Also, because the coping is filled with impression material, it will hydraulically displace air and any fluids, so we obtain a void-free impression of the prepared tooth, including the subgingival extension (Dimashkieh, 1995). For implant impression, many techniques are described in the literature to transfer the emergence profile from the provisional to the final restoration. In our case we made a custom impression coping by adding acrylic resin extraorally. The main advantage of this technique is that the autopolymerizing resin can be used without pressure on the soft tissues. This technique is fast, easy, and accurate (Papadopoulos, 2014).

Conclusion

Impression technique used in this article helps making accurate impressions of tooth preparations and implants simultaneously. By using a customized acrylic resin coping, the soft tissue is displaced when the impression material is mechanically forced into the sulcus. Thus, employing this technique is an alternative of making a two-step impression for the prepared tooth. On the other hand, the use of customized implant impression copings allows the reproduction of predictable restoration by transferring the emergence profile from the provisional restoration to the final restoration and insures optimum esthetic outcomes.

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