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# Management of Peri-implant Soft Tissue Emergence Profile and Accurate Transfer Technique

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#### Abstract

**Objectives:** Today, the focus of implant dentistry has moved from osseointegration to meeting aesthetic prospects. Aesthetic demands may be satisfied with a suitable emergence profile created in peri-implant healthy soft tissue, this could be a challenging and time-consuming stage. In this article, the one-step formation of a peri-implant emergence profile and an indirect impression technique that preserves the obtained soft-tissue form are described through cases.

**Methods:** In the cases with missing teeth in aesthetic areas, all detailed consent was obtained from the patients. After the placement of the implants, individual temporary crowns were placed immediately and were not removed until the osseointegration was completed in order to create a peri-implant soft tissue profile that would meet the aesthetic and biological requirements. After the healing period, impressions were taken using custom-prepared impression posts by adding resin material to support the formed mucosa. Thus, the soft tissue profiles could be reflected in the models, and the emergence profiles of temporary crowns could be transferred to the final restorations.

**Results:** The aesthetic and biological demands were practically satisfied at the expected level by following the present method.

**Conclusion:** It is possible to manage the soft tissue around the implant in one step and transfer it to the impression easily.

An ideal soft-tissue form that meets the aesthetic and biological demands can be obtained, and transferred to the permanent prosthesis, while time saved with this effortless clinical technique.

#### Introduction

Dental implants have evolved to the point that they are considered to be a routine, reliable, and preferred treatment option for replacing missing teeth [1-4]. The focus of implant dentistry has moved from osseointegration to meeting aesthetic prospects [5]. The amount and grade of peri-implant tissues and the adaptation during time are some of the main factors affecting the aesthetic result of implant-supported restorations [6,7]. Aesthetic demands may be satisfied with a suitable emergence profile created in peri-implant healthy soft tissue. Besides aesthetic expectations, a good emergence profile prevents the entrance of microorganisms and peri-implant infection by performing a barrier to effectively protect the bone [8,9]. Additionally, the absence of interdental papillae may create aesthetic and phonetic problems and can allow food impaction. The absence of interdental papillae is a challenging case to reconstruct due to the small dimensions and limited vascular supply of the interproximal space [10,11]. To achieve the desired emergence profile and interdental papillae, one can guide the tissue response during the healing phase after the implant placement. This peri-implant tissue guidance can be performed by the step-wise conditioning technique or the one-step immediate temporization approach [12-14]. After obtaining the emergence profile, it is a matter to be considered to reflect the soft tissue form to the impressions will be taken. Several techniques have been described such as using provisional restorations and/or customized impression copings to accurately duplicate the peri-implant emergence profile [15-19]. In the present article, the one-step formation of the peri-implant emergence profile, and an indirect impression technique to reflect the soft-tissue form obtained, was described via case reports.

#### Clinical Considerations

In the cases we presented in this article, regarding the anamnesis taken from the patients who applied to our clinic, there were only missing teeth but no other clinical and radiographic findings or any systemic disorders that would pose a risk in implant placement. In this study, we commit that all the rules required to be followed within the content of the "Higher Education Institutions Scientific Research and Publication Ethics Directive" are conformed with and that none of the cases under the heading "Actions Against Scientific Research and Publication Ethics" are not enforced. Implant surgeries were performed after detailed consent was obtained from the patients regarding treatment planning and the use of intraoral photographs. In order to form a peri-implant soft tissue shape that would satisfy the aesthetic and biological needs, the practitioners decided to make immediate temporary crowns, provided that primary stabilization was ensured. The individual acrylic temporary crowns were designed and manufactured by using computer-aided design/computer-aided manufacturing (CAD/CAM) technology according to the required shape of the soft tissue. After the inspection of functional and parafunctional incisal adjustments on the temporary crowns that were cemented to the Ti-bases of the implants and torqued to the implants, the gingiva were left to heal. The provisional crowns were not moved till the osseointegration time of the implants was completed. After the healing periods of the hard and soft tissues were completed, it was observed that the peri-implant tissues have shaped around the neck areas of the temporary crowns (Figure 1-3).



**Figure 1: Case 1:** Missing of maxillary lateral incisor tooth. Placement of the standard impression posts for the impression to be taken to fabricate an immediate temporary crown after implant placement. (A: frontal view; B: lateral view) The irregular form of the soft tissue after removal of the standard impression post is seen. (C: frontal view; D: lateral view) After one week from delivery of immediate custom temporary restoration. It is seen that the gingiva begins to reshape according to the gingival surface of the temporary crown. (E: frontal view; F: lateral view) After two months from the delivery of temporary restoration. The soft tissues approach the demanded emergence profile during the healing process. (G: frontal view; H: lateral view).



**Figure 2: Case 2:** Missing of maxillary central incisor teeth. After the placement of the implants, the formless and flat shape of the soft tissue is seen with the healing caps (A) and the standard impression posts (B). Stage of delivery of the individual immediate temporary restorations. (D: frontal view; C, E: lateral views) After one week from the delivery of temporary restorations (F). It is seen that the soft tissue begins to reshape according to the demanded emergence profile (G) and the interdental papillae initiated to form (H).



**Figure 3: Case 3:** Missing of maxillary canine tooth. The irregular form of the soft tissue is seen with the healing cap after implant placement. (A: frontal view; B: lateral view) After one week from the application of immediate temporary restoration. The gingiva begins to reshape according to the gingival surface of the temporary crown. (C: frontal view; D: lateral view) After two months from the delivery of temporary restoration. It is seen that the soft tissue surrounds the neck region of the temporary crown and attains the desired form during the healing process. (E: frontal view; F: lateral view). When the permanent restoration phases were started, custom impression posts were created to reflect the formed peri-implant tissue profile to the main impression. Individual impression posts were made by the addition of resin material in a way that mimics the gingival surfaces of the temporary crowns to support the shaped mucosa while the impressions were taken (Figure 4-7).



**Figure 4: Case 3:** Under the guidance of temporary canine tooth restoration, healthy mucosa attained the desired shape after four months.

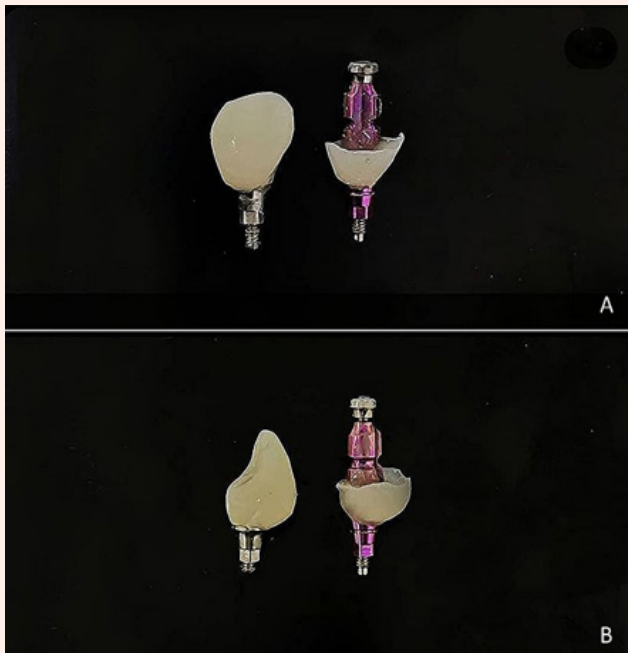


**Figure 5:** Case 3: The view from the labial (A) and incisal (B) of healthy mucosa having the demanded emergence profile and interdental papilla form, after removal of the temporary canine tooth restoration.

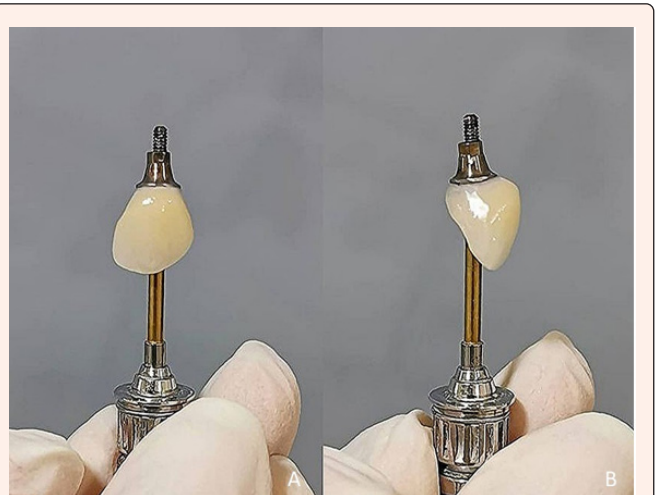


**Figure 7:** The custom impression post supports the shaped mucosa during the main impression stage.

To transfer the shape of the gingival surfaces of the temporary crowns to the copings, the temporary crowns were connected with the implant analogs, and the analogs were embedded in silicone impression material up to the maximum circumference level of the crowns. After the silicone had hardened, the temporary crown was removed and a standard impression post was placed. The gap between the impression post and the silicone material was filled with the resin material having a low curing contraction. The soft tissue form is precisely reflected in the casting model through the impression taken with the individual impression posts. Thus, the permanent custom abutments and restorations were shaped precisely analogous to the temporary crowns, and the demanded aesthetics and biological requirements could be maintained (Figure 8-12).



**Figure 6:** The custom impression posts were modified by the addition of resin material to mimic the gingival surfaces of the temporary crown. (A: labial view; B: distal view)



**Figure 8:** Labial (A) and distal (B) view of permanent canine tooth restoration.



**Figure 9:** Case 3: Permanent canine tooth restoration with demanded soft tissue profile from the frontal (A) and lateral (B) view.



**Figure 11:** Case 1: Frontal view of the implant-retained final restoration with required soft tissue profile in the maxillary lateral incisor tooth region.



**Figure 10:** Case 2: Permanent restorations in the maxillary central incisors region with demanded soft tissue profile. The appearance of healthy mucosa with the emergence profile and interdental papilla forms before the delivery of the final restorations (A). Delivery stage of the maxillary central teeth final restorations. (C: frontal view; B, D: lateral view).



**Figure 12:** Case 1: Labial view of the final maxillary lateral incisor tooth restoration having the demanded esthetic and biological requirements of the peri-implant mucosa.



## Discussion

This paper describes the chairside approach that reduces the clinical steps necessary to achieve the desired soft tissue contours with the use of immediate temporary crowns instead of standard healing abutments and the technique for transferring the obtained soft tissue form to the master cast. Hartog et al. [16] previously described a similar case report. To reshape the soft tissue that has healed after implant placement, a step-wise conditioning technique can be used. This technique requires multiple sessions that include modifying the temporary restoration until the reshaping of the peri-implant mucosa in demanded form has been achieved [17]. However, this approach is time-consuming, and removing the provisional crowns number of times can cause irritation of the peri-implant tissues and hazard the soft tissue barrier, and also the final aesthetic result [12]. Immediate temporization has advantages including the ability to provide optimal aesthetics by guiding the tissue response during the healing phase, and facilitating the production of final restorations, as well as protecting patients' well-being and self-esteem [13,14,16,20]. After removing the temporary crowns, due to the rapid depression of the peri-implant soft tissues, several impression techniques have been reported that duplicate the soft tissue form to the final restoration in a more appropriate method compared with the traditional impression technique [15,19]. The indirect technique that requires extra-oral additions of resin to impression posts reflects completely the form of the peri-implant mucosa surrounding the temporary crowns and allows delivery to the laboratory [15,18,19]. The primary benefit of the extraoral acrylic resin addition is the none of connection of the resin with the tissue. Therefore, the auto polymerizing resin can be applied in a dry environment without putting pressure on the soft tissues [19,20]. The possible disadvantage is the rapid tissue depression while preparation of the individual impression posts and the resulting soft tissue pain because of the placement of the posts [19]. This can be bypassed by attaching a healing cap molding it with a resin material [18].

## Conclusion

The demanded emergence profile can be created with the provisional crowns placed after implant placement immediately in one step. The mucosa profile formed by temporary crowns can be transferred on the models, so permanent restorations, owing to the impressions taken with the individual impression posts. Thus, the aesthetic and biological anticipations can be satisfied such as expected.

## References

1. Kan JY, Rungcharassaeng K (2000) Immediate placement and provisionalization of maxillary anterior single implants: A surgical and prosthodontic rationale. *Pract Periodontics Aesthet Dent* 12(9): 817-824.
2. Spear FM (1999) Maintenance of the interdental papilla following anterior tooth removal. *Pract Periodontics Aesthet Dent* 11(1): 21-28.
3. Andersson B, Odman P, Lindvall AM, Branemark PI (1998) Five-year prospective study of prosthodontic and surgical single-tooth implant treatment in general practices and at a specialist clinic. *Int J Prosthodont* 11(4): 351-355.
4. Albrektsson T, Zarb G, Worthington P, Ericsson AR (1986) The long-term efficacy of currently used dental implants: A review and proposed criteria of success. *Int J Oral Maxillofac Implants* 1(1): 11-25.
5. Farronato D, Manfredini M, Mangano F, Goffredo G, Colombo M, et al. (2019) Ratio between Height and Thickness of the Buccal Tissues: A Pilot Study on 32 Single Implants. *Dent J* 7(2): 40.
6. Buser D, Martin W, Belser UC (2004) Optimizing esthetics for implant restorations in the anterior maxilla: anatomic and surgical considerations. *Int J Oral Maxillofac Implants* 19: 43-61.
7. Chappuis V, Araujo MG, Buser D (2017) Clinical relevance of dimensional bone and soft tissue alterations post-extraction in esthetic sites. *Periodontology* 2000 73: 73-83.
8. Priest G (2003) Predictability of soft tissue form around single-tooth implant restorations. *Int J Periodontics Restorative Dent* 23(1): 19-27.
9. Phillips K, Kois JC (1998) Aesthetic peri-implant site development. The restorative connection. *Dent Clin North Am* 42(1): 57-70.
10. Tarnow DP, Magner AW, Fletcher P (1992) The effect of the distance from the contact point to the crest of bone on the presence or absence of the interproximal dental papilla. *J Periodontol* 63(12): 995-996.
11. Nordland WP, Sandhu HS (2008) Microsurgical technique for augmentation of interdental papilla: three case reports. *Int J Periodontics Restorative Dent* 28(6): 543-549.
12. Elian N, Tabourian G, Jalbout ZN, Classi A, Cho SC, et al. (2007) Accurate transfer of peri-implant soft tissue emergence profile from the provisional crown to the final prosthesis using an emergence profile cast. *J Esthet Restor Dent* 19(6): 306-314.
13. Castillo RA (2006) Immediate provisionalization of a single-tooth implant with a temporary cylinder in one surgical appointment. *Pract Proced Aesthet Dent* 18(5): 3-5.
14. Hartog L, Raghoobar GM, Stellingsma K, Vissink A, Meijer HJ (2016) Immediate Loading of Anterior Single-Tooth Implants Placed in Healed Sites: Five-year results of a randomized clinical trial. *Int J Prosthodont* 29(6): 584-591.
15. Hsieh YL, Aronovich S, Munz S, Liu F (2019) A Technique to Simultaneously Fabricate Multiple Custom Impression Posts for Implant-Supported Restorations in the Esthetic Zone. *J Prosthodont* 28(3): 339-342.
16. Hartog L, Raghoobar GM, Stellingsma K, Meijer HJ (2009) Immediate loading and customized restoration of a single implant in the maxillary esthetic zone: a clinical report. *J Prosthet Dent* 102(4): 211-215.
17. Oh KC, Kim JH, Woo CW, Moon HS (2019) Accuracy of Customized Prefabricated Screw-Type Immediate Provisional Restorations after Single-Implant Placement. *J Clin Med* 8(4): 490.
18. Ntounis A, Petropoulou A (2010) A technique for managing and accurate registration of periimplant soft tissues. *J Prosthet Dent* 104(4): 276-279.
19. Papadopoulos I, Pozidi G, Goussias H, Kourtis S (2014) Transferring the emergence profile from the provisional to the final restoration. *J Esthet Restor Dent* 26(3): 154-161.
20. Santos PH, Suzuki TY, Martini AP, Oliveira Reis B, Assunção WG, et al. (2019) Emergence profile customization technique during implant transfer. *J Indian Prosthodont Soc* 19(2): 197-200.