



Research Paper

## Optimizing Soft Tissue Management Around the implant: A case report and clinical insights in the aesthetic zone

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**Abstract:** Soft tissue management is crucial for achieving aesthetic success in implant dentistry, particularly in challenging cases where tissue deficiencies are present. This article presents a case report highlighting the significance of collapsed soft tissue preservation through direct custom impression coping techniques. The use of interim restorations facilitated soft tissue contouring, ensuring an ideal emergence profile for the final prosthesis. Through meticulous impression-taking methods, including the recording of soft tissue contours and the utilization of custom impression copings, accurate replication of the peri-implant soft tissue profile was achieved. This approach minimizes chair time, reduces the need for acrylic resin, and promotes precise soft tissue contouring, resulting in excellent outcomes for implant-supported restorations in the anterior aesthetic zone.

### Highlights

- The case report underscores the critical role of soft tissue management in achieving optimal aesthetic outcomes in implant dentistry, especially in challenging cases with inadequate tissue.
- Utilizing an interim restoration facilitated soft tissue contouring, allowing for the development of the desired emergence profile essential for a successful final restoration.
- Meticulous impression-taking methods, including recording soft tissue contours using composite resin material and impression posts, ensured accurate replication of the peri-implant soft tissue profile.
- By focusing on replicating soft tissue contours accurately, this approach results in excellent emergence profiles for implant-supported restorations in the anterior aesthetic zone, contributing to superior aesthetic outcomes and patient satisfaction.

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### I. Introduction

Soft tissue management in implant dentistry represents a pivotal aspect in achieving optimal esthetic outcomes. Successful implant restoration in the aesthetic zone is a very challenging approach when tissues are inadequate.(1) Certain cases require prosthetic resolution, even with the well-established procedures for hard and soft tissue augmentation protocols.(2)

The emergence profile of an implant-supported restoration is critical for hygiene and aesthetics.(3) Whenever these prefabricated components are used to restore aesthetically difficult circumstances, the outcome is typically an unnatural sulcular shape around the abutments and a poor final restoration in terms of

appearance.(4) One strategy of contour development is to use a temporary restoration to shape and contour the soft tissues surrounding the implant.(5) Apart from the provisional restoration, reproducing the soft tissue contour is multifaceted approach. Various methods have been suggested for the fabrication of a custom impression coping for reproduction of the peri-implant soft tissues.

This article delves into the importance of soft tissue management, highlighting the significance of ridge preservation by direct custom impression coping techniques. The article aims to provide comprehensive insights into achieving optimal esthetic outcomes in implant dentistry.

## **II. Case Report**

A 24-year-old female patient presented to the Department of Prosthodontics with a history of missing teeth, specifically the maxillary right central incisor, due to root caries and subsequent extraction. Following examination and investigation, it was determined that the best treatment plan would be to proceed with implant placement for the maxillary right central incisor.

A 4\*11 mm endosteal implant was successfully placed, and after four months, the second stage procedure was performed, which included the placement of a healing abutment. It was decided to use a metallic ceramic for a definitive prosthesis. Before the final prosthesis could be fabricated, it was necessary to ensure proper management of the soft tissue surrounding the implant site (Fig 1). This was accomplished by using interim restoration, which allowed for the contouring of soft tissue to create the desired emergence profile. The impression for the provisional prosthesis was made using a closed tray technique, and a provisional restoration was fabricated using acrylic resin (Fig 2). Over three months, the provisional restoration was routinely adjusted and contoured using a composite resin material to guide the soft tissue.

The acrylic was added, and the excess was removed, polished, and examined intraorally and radiographically. (Fig 3) The provisional restoration was allowed to remain intraorally for 4–8 weeks to ensure an optimal emergence profile. Overall, the soft tissue management with the provisional restoration was satisfactory, setting a solid foundation for the final implant restoration (Fig 4).

For the final restoration, a meticulous approach was taken to ensure accurate impression-taking using the open tray method. During the impression procedure, care was taken to avoid any soft tissue displacement. To achieve this, the soft tissue contours were first recorded using a composite resin material by using impression posts (Fig 5). This initial step was crucial in capturing the natural shape and position of the soft tissue without causing any distortion or displacement. By recording the soft tissue contours before the impression, we were able to create a stable foundation for the subsequent impression-taking process.

Before the final impression, a radiograph was taken with the impression post to check the accuracy. The implant position and the rest of the arch were captured using polysiloxane impression material in a special tray. After removing the impression, the implant analogue was attached to the impression coping. The definitive cast at the area of the soft tissue around the implant was generated using soft tissue simulation material, and the remaining portion of the definitive cast was then poured with die stone to create a stable base for the fabrication of the final prosthesis. The final prosthesis was fabricated and delivered to the patient (Fig 6).

## **III. Discussion**

This case report outlines a clinical technique that aids in recording the gingival contour in a definitive impression to create an emergence profile for the implant crown. It is a comparatively simple, accurate, and reliable approach for replicating the soft tissue profile. The quantity of keratinized mucosa, the height and thickness of the bone, and the form and composition of the transmucosal implant prosthetic components all affect the outcome that is achieved.(6)

Following second-stage surgery, provisional restoration for implant-supported restoration can aid in the following four contexts:

1. development of an interdental or interimplant papillae
2. better tissue contours related to the emergence profile
3. potential avoidance of a third surgical procedure
4. customization to form an aesthetically contoured prosthesis during the healing process.(7)

The peri-implant tissue's health, sanitation, and aesthetics are significantly impacted by the emergence profile of the implant-supported restoration. The features of the interim prosthesis actively shape the peri-implant soft tissues, allowing the clinician to observe, analyze, and change the existing tissue profile before taking an impression for a definitive prosthesis.(8) Without an appropriate dimensional transfer tool, transferring sculpted soft tissue will be difficult, if not impossible. It is obvious that using stock impression copings, due to their cylindrical shape, captures peri-implant soft tissue profiles and becomes erroneous. If the healed soft tissue contour is not properly replicated in the definitive impression, the final emergence profile might differ from the profile established by the interim restoration, potentially resulting in a compromised aesthetic outcome.

Several techniques, both direct and indirect, are used to produce customised impression coping. The direct procedure includes intraoral scanners.(9) The authors described several approaches for capturing and reproducing the contours of peri-implant tissues produced using an implant-supported provisional prosthesis. Hinds introduced one of these approaches in 1997.(10) The indirect method involved registering the tissue part of the implant-supported provisional prosthesis in a mould with elastomeric impression material, such as an adhesive impression, and then using this imprint to fabricate the custom impression coping that will replicate the contour of the implant-supported provisional prosthesis.(11) This takes place outside of the patient's mouth, and therefore it is an "indirect technique" (IT).

After removing the provisional crown and replacing it with a stock impression coping, a custom impression coping is placed directly in the patient's mouth and coated with a flowable composite that allows for the capture and transfer of peri-implant soft tissues contour onto the master cast.(12) This approach is referred to as the "direct technique" (DT).

#### **IV. Conclusion**

This approach used in this case report is unique in that it minimises chair time and avoids the use of acrylic resin, which can cause tissue damage. It also reduces surgical procedures by remodelling soft tissue throughout the healing phase to get the desired form. Additionally, preventing soft tissue collapse during the impression ensures the precise contour of peri-implant soft tissue. The emergence profile recorded with this technique is from soft tissue contour not from the provisional restoration. This method could be employed for single or multiple implant-supported restorations in the anterior aesthetic zone, yielding excellent outcomes.

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#### **FIGURES**



Fig 1 collapsed tissue in relation to left maxillary incisors



FIG 2 Acrylic provisional restoration

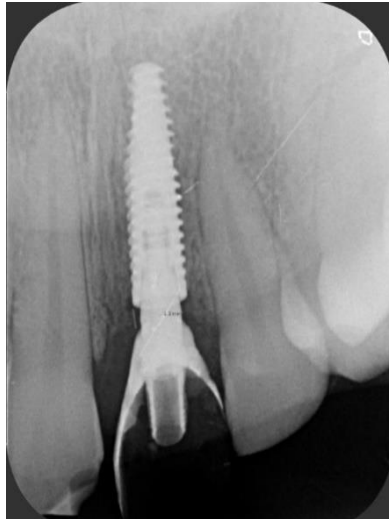


Fig 3 Radiographic image of provisional restoration after relining to shape soft tissue



FIG 4- contoured soft tissue profile after removal of provisional restoration



Fig 5 Replicating soft tissue contours using composite resin



Fig 6 Definitive prosthesis