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Simplifying Emergence Profile Transfer in Implant Restorations: A Case Report on Direct Technique

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Abstract

Introduction

The aesthetic success of implant-supported restorations relies heavily on the proper shaping of the emergence profile. This case report demonstrates the direct transfer of the emergence profile using flowable composite resin during the final impression phase.

Case Presentation:

A 32-year-old male patient with trauma to the maxillary left lateral incisor received a Neodent implant with immediate provisional restoration. Over 6 months, the provisional crown shaped the gingival contour. After verifying osseointegration, the space between the abutment and gingiva was filled with composite resin to transfer the emergence profile.

Results

The technique successfully preserved the gingival architecture, ensuring a natural-looking final restoration. The patient achieved an aesthetic outcome with well-integrated soft tissues and a stable implant.

Conclusion

Direct transfer of the emergence profile using composite resin offers a cost-effective, efficient approach for single-tooth implants, preserving soft tissue contours and improving aesthetic results. Digital technologies may further enhance precision in future procedures.

Keywords

Direct -Emergence profile, dental implants, anterior sector, provisional prosthesis, personalized transfer, soft tissue management, conventional technique.

Introduction

The aesthetic success of implant-supported restorations is fundamentally dependent on the form and health of the surrounding peri-implant tissues. For achieving optimal results, definitive restorations must reflect and maintain the soft tissue contours established by provisional restorations during the healing phase. Provisional restorations play a critical role in shaping the gingiva and ensuring that the final prosthesis integrates seamlessly with the natural anatomy of the surrounding soft tissues. In particular, after the removal of the implant healing caps, the gingival geometry tends to be circular, though incisors typically exhibit a more triangular gingival profile. This profile can be gradually shaped over the course of 3 to 4 months by incrementally adding or removing composite resin to the provisional restoration, mimicking the final contours of the restoration.(1)

A screw-retained provisional restoration is often recommended, primarily due to the absence of cement, which avoids potential complications with cement retention. However, in cases where the screw access is unfavorably positioned, a cement-retained provisional restoration may be the preferred choice. Once a natural and aesthetically pleasing emergence profile is achieved, both the clinician and patient are satisfied with the outcome, and a final impression can be taken to create the definitive master cast. (2)

The soft tissue contours created by the provisional restoration must be preserved in the definitive model for accurate communication with the laboratory, ensuring a predictable and aesthetically pleasing final prosthesis. To transfer the emergence profile effectively, both direct and indirect techniques can be employed. While indirect techniques involve the use of custom impression copings, they often come with the added costs of materials and increased chair time. On the other hand, direct techniques utilize the provisional restoration itself as impression coping, or alternatively, employ an in situ registration of the surrounding tissues, streamlining the process and improving efficiency.(3,4)

The primary objective of this article is to describe a direct technique that preserves and accurately transfers the emergence profile in single implant-supported prostheses. This is achieved by the intraoral application of a flowable, photo-polymerized composite during the final impression procedure, which allows for precise replication of the emergence profile established by the provisional restoration. This approach aims to provide clinicians with a reliable, time-efficient method for achieving both aesthetic and functional outcomes in implant-supported prosthodontics

Observation

A 32-year-old male patient, in good general health, presented at the CHU Farhat Hached in January 2024, seeking restoration following trauma to his upper left lateral incisor (tooth #22). The trauma had resulted in significant damage to the tooth, and the patient was unable to restore the tooth conservatively. After a thorough clinical and radiographic evaluation, the decision was made to replace the damaged tooth with a dental implant.

Treatment Planning and Procedure:

The treatment plan was outlined to replace tooth #22 with a Neodont implant, utilizing an immediate implant placement approach. Given the patient's esthetic concerns and the need to preserve the surrounding gingival architecture, immediate provisional restoration was planned immediately after implant placement. This would provide not only functional restoration but also maintain the esthetic contour of the gingiva during the healing period.

The implant was successfully placed, and a screw-retained provisional restoration was immediately inserted to help shape and support the surrounding gingival tissue. This provisional restoration was carefully monitored for its ability to guide the soft tissue healing process, with regular adjustments as necessary to ensure the correct gingival contour. (Fig 1)

Fig.1 Provisional crown in place.

After **6 months**, a follow-up appointment was scheduled to verify **osseointegration** of the implant. Radiographic evaluation and clinical examination confirmed the successful integration of the implant into the bone, with no signs of complications or implant failure. (**Fig 2**)

Fig.2 Control X-ray after complete osteointegration of the implant

The soft tissue around the implant had healed well, and the emergence profile, created by the provisional restoration, was maintained. (**Fig.3**)

Fig.3: Complete mucosal healing of the peri-implant tissues

At this stage, the provisional restoration was removed, and the implant was ready for the definitive restoration. The first step in the final restoration process involved the placement of a **standard impression abutment(transfer)** into the implant connection to allow accurate transfer of the implant position to the final model. (**Fig 4**)

Fig.4: Placement of the custom transfer in place

Next, the space between the impression transfer and the surrounding gingiva was carefully filled with **flowable composite resin** (Filtek Supreme XTE Flowable Restorative; 3M ESPE). The resin was applied in layers, each no more than **2mm in thickness**, to gradually build up the emergence profile.
This step ensures that the final restoration will seamlessly integrate with the gingival tissue and replicate the emergence profile established during the provisional phase. (**Fig 5**)

Fig.5: Injection of resin around the implant transfer in layers

The composite resin was subsequently **polymerized** in layers to ensure a stable, durable material for the final impression (Figure 3). This process helped preserve the tissue contours and allowed the laboratory to replicate the precise gingival architecture and implant position for the definitive restoration. (**Fig 6**)

Fig.6: Obtaining a custom transfer

In this case, an intraoral radiograph may be necessary to verify the correct fit of the impression abutment onto the implant, ensuring that there is no misalignment and that the abutment seats
properly within the implant connection. This step is crucial to prevent any potential issues during the fabrication of the final restoration. (**Fig 7**)

Fig.7: control X-ray of its adaptation

The final impression was taken using the open tray (pick-up) technique, where the customized transfer recorded the emergence profile onto the working model. (**Fig 8**)

Fig 8(a-b): Final Impression with Open Tray Technique

This technique ensures that the profile captured during the provisional phase is accurately reproduced in the final prosthesis, achieving a perfect aesthetic result. (**Fig 9**)

Fig 9: Final result

Discussion

The successful integration of implants into the oral cavity and the aesthetic outcome of implant-supported restorations depend largely on the careful management of soft tissues. The emergence profile, which refers to the contours and shape of the surrounding gingival tissue around the implant, plays a pivotal role in achieving both functional and aesthetic success.
This case report demonstrates the significance of maintaining and accurately transferring the emergence profile, particularly through the use of provisional restorations and a direct transfer technique.[4]

Provisional restorations are indispensable in implant therapy, especially in single-tooth replacements. They serve multiple roles: they facilitate soft tissue healing, guide the formation of the emergence profile, and allow the clinician to make adjustments for optimal tissue integration. The gradual shaping of the gingiva through a screw-retained provisional restoration, as seen in this case, is critical for

achieving predictable results. The provisional crown provides both functional and aesthetic benefits while ensuring the gingiva is sculpted to support the final restoration. Over time, adjustments to the provisional restoration can further refine the gingival contours to match the anticipated final outcome.

The emergence profile is a critical element in the aesthetic success of implant restorations. If the soft tissue surrounding the implant does not adapt correctly to the final restoration, it can result in poor aesthetics, including tissue recession or an unnatural appearance. The correct shaping of the emergence profile can mimic the natural contours of the surrounding teeth, ensuring that the final prosthesis blends seamlessly with the patient's smile. As shown in the case, the use of flowable composite resin to build the emergence profile directly during the impression phase ensures that the gingival tissue remains in the desired shape, which is then transferred to the final restoration.[5]

In this case, a direct technique was used to transfer the emergence profile, utilizing the provisional restoration and flowable composite resin. Direct techniques offer several advantages over indirect methods, particularly in terms of time and cost. However, they do require careful management of material application to avoid any distortion during polymerization.[6]

With the rise of digital dentistry, the role of technology in implant-supported restorations is becoming increasingly significant. Digital techniques allow for more precise planning, execution, and evaluation of implant placements and restorations.

One of the most promising advancements is the **digital transfer of the emergence profile**. By utilizing 3D scanning, clinicians can now digitally capture the contours of the gingiva and transfer these data directly into the design of the final restoration. This method not only improves the fit and aesthetics of the final crown but also offers the possibility of real-time adjustments during the planning stage, significantly reducing the chances of error.[7-9]

Challenges and Considerations:

One of the main challenges in transferring the emergence profile is ensuring that the flowable composite resin is applied in precise layers without distortion. A thorough understanding of the soft tissue behavior and the correct polymerization technique is essential to achieving the desired result. Additionally, careful radiographic and clinical assessment is required to verify the accurate fit of the implant abutment and impression coping to avoid any complications in the final restoration process.

Furthermore, the success of the direct transfer technique relies on the clinician's ability to manage the provisional restoration effectively during the healing period. If the gingival contour is not shaped appropriately, it could lead to complications,

such as poor adaptation of the final restoration or esthetic compromise.

Conclusion

This case report highlights the importance of achieving an accurate transfer of the emergence profile for the success of implant-supported restorations. The use of provisional restorations and direct transfer techniques not only enhances the esthetic outcomes but also facilitates the creation of a functional and stable restoration. By preserving the soft tissue contours and ensuring their accurate transfer, clinicians can provide patients with more predictable, aesthetically pleasing results.

With the advent of digital technologies in dentistry, such as digital impressions, 3D scanning, and CAD/CAM systems, the accuracy and efficiency of the transfer of the emergence profile
can be further enhanced. These tools offer a higher level of precision and convenience, making them valuable additions to any clinician's practice. The integration of digital workflows may become increasingly important in the future, offering a more streamlined and effective approach to implant restoration.

Future studies are needed to further explore the long-term effects of direct transfer techniques on peri-implant tissue health and the overall survival of implant-supported restorations. The evolution of materials, techniques, and technologies in implantology promises even more refined approaches to tissue management, ultimately enhancing the quality of life for patients seeking dental implants.

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