

# Transfer of Esthetic Gingival Contour for Anterior Implant Prosthetics

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## ABSTRACT

Communication of the exact positioning of the gingival margin is critical to achieving anterior esthetics with implant fixed prosthetics. The time taken to shape and position the gingiva with a provisional restoration can be lost at the impression appointment. Upon removal of the provisional restoration, the gingival complex collapses losing positioning and hampering the laboratory in fabrication of the final restoration. This article shall review a technique to replicate and communicate the soft tissue positioning and support to the laboratory using custom impression copings, allowing better esthetics with the restoration upon placement.

**Keywords:** Soft tissue position, Fixed implant prosthetics, Laboratory communication, Custom impression coping.

## INTRODUCTION

Anterior implant esthetics—three words that imply numerous and treacherous pitfalls and strike fear into the hearts of restorative dentists. Among the challenges is the accurate and predictable communication of proper final tissue contours to the dental laboratory.<sup>1,2</sup> Only with proper communication of the gingival architecture, the laboratory can provide a natural appearing restoration.

Anatomical and esthetic gingival contours make or break the anterior case. A natural and healthy gingival architecture that mimics and blends with natural dentition is not only highly desirable but also, in most cases, attainable. With proper placement of the implant body, adequate soft tissue and a temporary restoration that guides and shapes the tissue into life-like contours, an implant restoration in the anterior region can appear natural and beautiful.<sup>3-5</sup>

Placement of the fixture, as referenced in numerous articles, is facilitated by good communication between the restorative dentist and the surgeon and is achieved through accurate surgical guides.<sup>5</sup> Proper orientation of the fixture is required in the mesiodistal, buccal-lingual and occlusogingival planes. When deficiencies in the hard and/or soft tissue prevent ideal placement of the fixtures then allografting and autografting techniques may be utilized to supply abundant soft tissue with which to create esthetic contours.

Once the implant is placed and the tissue has healed, sculpting of interproximal papillae and the buccal crescent of gingiva are accomplished with sequential fixed temporaries.<sup>6,7</sup> Stepwise addition of temporary material

manipulates tissues to place, and creates proper esthetic contours. Once accomplished, these contours must be accurately and predictably conveyed to the laboratory.

Enter the ‘custom impression coping’. By copying the final contours of the fixed, esthetic temporary restoration to an impression coping, gingival tissue is supported in the correct anatomical position during the impression procedure. This prevents tissue collapse during the impression phase and allows an accurate communication of the position of the soft tissue.

## CASE REPORT

A 55-year-old female was sent by her surgeon to treatment plan an implant in the edentulous area of tooth no. 9 (upper left central incisor). The space had been occupied by an ill fitting and unesthetic bonded pontic. The patient desired more natural and harmonious smile.

A surgical guide created by the restorative dentist in concert with the surgeon was used to place the implant in proper position. Healing took place over 6 months at which time the fully integrated fixture was surgically exposed by removing a plug of tissue with a surgical trephine. A 5 mm healing abutment was placed and the patient was immediately sent to the restorative dentist to begin tissue manipulation with the temporary restoration.

A screw-retained temporary abutment (Biomet 3i, Palm Beach Gardens, FL) was air abraded using 50 micron alumina oxide (Danville Engineering, San Ramon, CA). The roughened temporary abutment was then coated with a bonding agent (Prime and Bond, Dentsply Caulk, Milford,

DE), and a hybrid composite resin (Esthet-X, Dentsply Caulk, Milford, DE) was added to the screw-retained temporary abutment head to shape the tissue to the desired gingival contours. The supragingival portion was created intraorally with the temporary abutment cylinder screwed into place. Once this was formed, the subgingival portion was created extraorally in the laboratory.

Over a period of several weeks, the temporary abutment cylinder was modified by adding and subtracting composite subgingivally until it reached final esthetic contour, and the surrounding tissues were in proper position. When these tissues were pink, firm, stable and healthy, an open impression tray was fabricated (Triad Transheet, Dentsply Prosthetics, York, PA) (Figs 1 and 2).

It has been noted and documented that once the temporary restoration is removed, the gingival tissues tend to collapse and slump rather rapidly over the implant platform. Even a relatively fast impression with a standard impression coping will result in an inaccurate model of proper esthetic gingival contour. While some laboratories may be able to compensate for this by manipulation of the models, it is unpredictable and seldom as esthetically correct as the temporary restoration. The custom impression coping solves this problem.

Since the gingival portion of the temporary supports the tissue, this is the area that must be copied. The temporary restoration was secured to an appropriate laboratory analogue, and the tissue surface was lubricated (Dentsply Triad model release agent). A quick set laboratory stone (Grey Set FS—Dental Mfg Corp, Newark, NJ) was mixed by using a vibrator and placed into a container. The laboratory analog and attached temporary restoration were inserted to the height of contour of the restoration and allowed to set (Figs 3 to 5).

Once the stone was completely set, the temporary abutment cylinder was unscrewed from the analog and removed from the stone. The analog remained at the bottom of a smooth and accurate impression of the contours of the temporary restoration making a mold to create the custom impression coping (Fig. 6).

A stock open tray impression coping was next used to create the custom impression coping. To aid in the adhesion of the custom material to the coping, the end of the coping facing the implant analogue, but avoiding the portion in contact with the analogs platform, was roughed up with a diamond (Brasseler USA, Savannah, GA) and air abraded as previously described to roughen the temporary abutment. The stone impression was lubricated with model release agent (name and company) and the impression coping, after being coated with bonding agent (Prime and Bond), was screwed onto the implant laboratory analog embedded in the stone mold (Figs 7 and 8). Flowable composite (Flow-it, Pentron Clinical Technologies, Wallingford, CT) was carefully injected around the coping into the stone mold and light-cured in layers to ensure complete curing of the



**Fig. 1:** Screw-retained implant provisional restoration at site 9, placed at time of implant uncovering



**Fig. 2:** Screw-retained provisional following soft tissue healing and development of soft tissue contours and emergence profile



**Fig. 3:** Screw-retained provisional restoration affixed to an analog is immersed in model stone to the height of contour



**Fig. 4:** Incisal view of the screw-retained provisional restoration affixed to the analog within the model stone

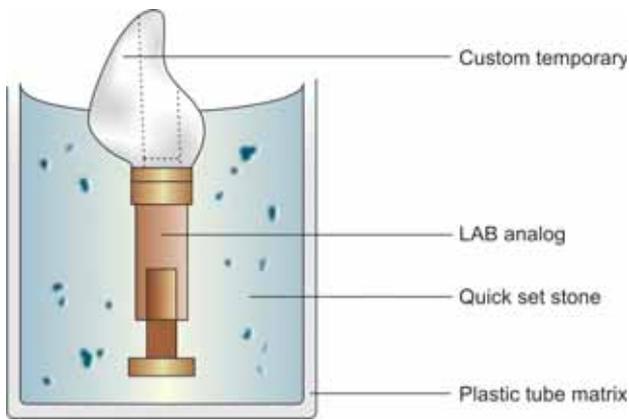


Fig. 5: The fabrication of the custom model matrix



Fig. 6: Screw-retained provisional removed from the analog within the matrix demonstrating the matrix replicating the emergence profile achieved by the provisional



Fig. 7: Materials used to fabricate the custom impression coping (custom matrix, flowable composite, open tray impression head and long pin)



Fig. 8: Custom matrix with open tray impression head placed on the analog

resin within the mold (Fig. 9). Alternatively, Duralay self cure resin (Reliance Dental, Worth, IL) may be used in place of the flowable composite resin.

Once cured, the coping was unscrewed from the implant analog and removed from the stone mold. The perfect replica of the tissue portion of the temporary was then wiped with alcohol to remove uncured resin in the air inhibited layer. This replica, the custom impression coping, was ready for the final impression (Fig. 10).

After orienting intraorally on the implant after removal of the temporary restoration, the custom impression coping was fixated to the implant via a long impression pin, supporting the soft tissue as the temporary restoration had previously. The tissues, properly supported, regained the desired contours created by the temporary. An open tray impression using a custom tray (Triad Transheet, Dentsply Prosthetics, York, PA) previously fabricated was filled with a polyether impression material (Impregum, 3M/ESPE, St. Paul, MN) which was taken and sent to the laboratory along with an interocclusal bite record using a rigid PVS bite material (Correct Bite, Pentron Clinical Technologies, Wallingford, CT) and an opposing model (Figs 11 to 13). Additionally, an impression of the temporaries was taken intraorally to aid the laboratory in seeing the desired crown

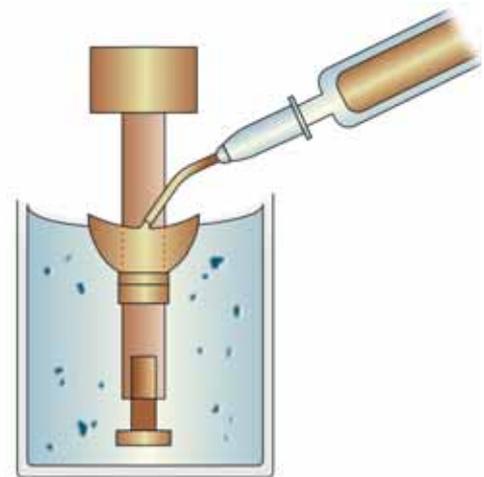


Fig. 9: Fabrication of the custom impression coping

contours and a stick bite to further define the incisal plane and midline.

The laboratory using the open tray impression with the custom impression coping was able to fabricate a soft tissue model. This replicates sulcus dimensions and gingival margin position as developed intraorally permitting the laboratory to design a restoration that mimics what has been developed intraorally and provides natural esthetics.

On delivery, the restoration fits precisely and harmoniously with the natural and esthetic contours of the



Fig. 10: Completed custom impression coping ready for intraoral use



Fig. 13: Open tray impression with custom open tray impression head embedded within

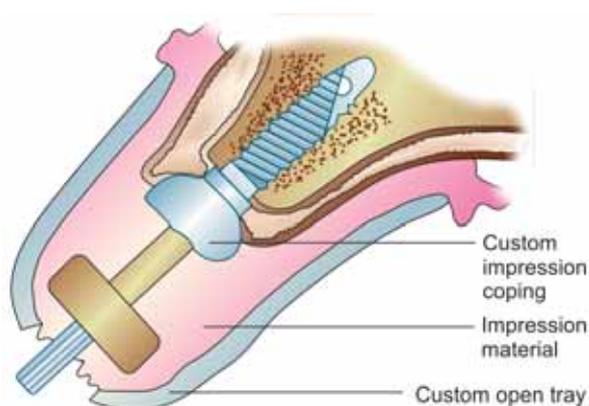


Fig. 11: Custom impression coping is utilized



Fig. 14: Final restoration showing good soft tissue support and emergence profile replicating, what was achieved with the provisional



Fig. 12: Custom impression coping fixated intraorally supporting the soft tissue

gingiva. The implant-supported restoration is indistinguishable from the adjacent teeth and is a functional and esthetic success. The guesswork as to where the tissue will position after restoration placement is eliminated (Fig. 14).

## CONCLUSION

The key to esthetic results with implant fixed restorations is communication of the soft tissue position to the laboratory.

We work hard to develop the position of the gingival margin and the emergence profile, but, when impressions are captured, the soft tissue changes position. Tissue collapse occurs as soon as the provisional restoration is removed from the implant fixture.

The methods, described herein, detail a technique to replicate the soft tissue support and thus replicate the gingival margin position developed with the provisional restoration. Thus, the final restoration provides the esthetic results both the practitioner and patient have worked to develop in the provisional phase.

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