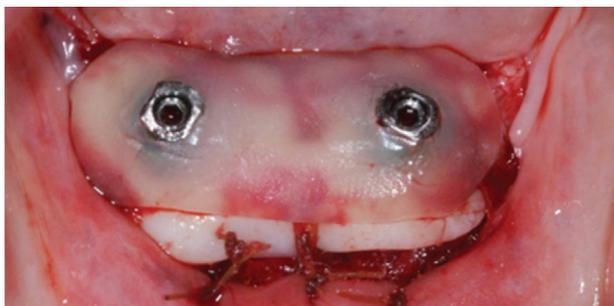


## Stabilization Techniques for Soft Tissue Grafting Around Dental Implants: Case Report

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**Introduction:** Implants that lack keratinized tissue (KT) have been associated with increased plaque accumulation, gingival inflammation or hue of metal showing through the tissue. Free gingival grafts (FGGs) are a predictable treatment for minimal or lack of KT. FGGs can increase the zone of KT around teeth and implants alike. Despite predictability of FGGs, stabilizing the graft around implants can be challenging, but is critical for success. Little information is available regarding ways to stabilize FGGs around implants. Acrylic or composite stents are a viable option for obtaining graft stability and support during the healing process.

**Case Presentation:** This case report highlights the practicality of using acrylic or composite stents for FGG stabilization with successful outcomes. Two patients presented with dental implants, with minimal or lack of KT requiring soft tissue augmentation. FGGs were harvested from the palate and fitted around implant carriers allowing stabilization and adequate suturing. Custom-made acrylic or composite stabilization stents were fabricated to fit around implant carriers, which were screwed into the implant platform, and hollowed out internally to provide space for the graft. Postoperative visits showed healthy, stable zones of KT in both cases.

**Conclusion:** The customized acrylic or composite stents allowed stabilization of the FGGs with successful outcome. *Clin Adv Periodontics* 2019;9:192–195.

**Key Words:** Dental implant; free tissue flaps/transplantation; gingiva transplantation; stents; surgical flaps/surgery.

### Background

Keratinized tissue (KT) is thought to be important in maintenance of health around teeth and dental implants.<sup>1–4</sup> Although not essential to survival of either

teeth or implants, KT allows patients to perform adequate oral hygiene,<sup>5,6</sup> chew without discomfort, and hide the gray hue of implants in the esthetic zone. Multiple techniques for augmenting KT around dental implants have been advocated.<sup>7,8</sup>

Connective tissue graft is considered the gold standard for root coverage and for better color match,<sup>9</sup> but free gingival grafts (FGGs) increase the width of KT.<sup>10,11</sup> Additionally, FGGs promote KT on the surface of the mucosa providing better comfort for patients during mastication and cleaning.<sup>10,11</sup> Presence of KT surrounding dental implants is linked to improved periodontal health in many studies.<sup>4,5</sup> A 15-year cross-sectional study indicated that implants surrounded with adequate KT had significantly lower plaque and bleeding indices than implants with no KT.<sup>5</sup>

In cases where there is minimal or lack of KT around implants, a mucogingival correction may be indicated. The FGG is the treatment of choice to address this issue

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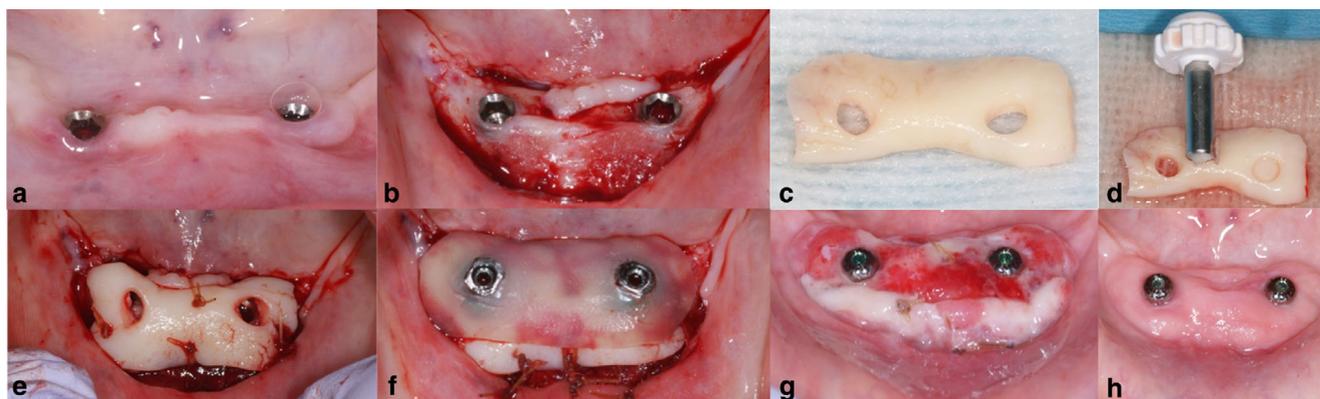
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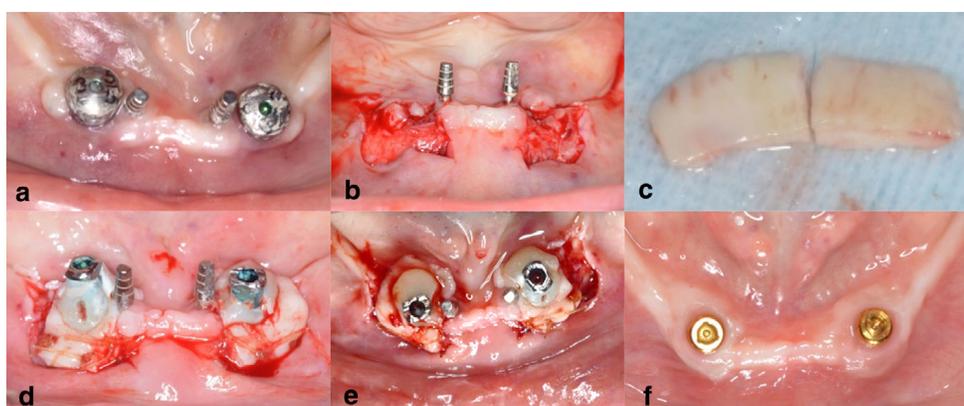
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**FIGURE 1** **1a** Occlusal view of initial clinical presentation 5 months after second stage surgery showing inadequate keratinized tissue on the buccal and lingual of two dental implants planned as overdenture abutments. **1b** Partial thickness flaps prepared around implants before FGG application. **1c** FGG with fenestrations ready to be placed around implants. **1d** The use of a soft tissue punch to put holes in FGG to fit around implants. **1e** FGG sutured around implants before carrier placement. **1f** Stabilization of FGG using a single acrylic stent held in place with shortened implant carriers and screws. **1g** FGG healing at 2 weeks. Note that graft showed normal healing. **1h** Normal healing of FGG at 2 months. Note the increased zone and thickness of KT.



**FIGURE 2** **2a** Occlusal view showing lack of KT around implant #22 and 27 after healing abutment connection. **2b** Facial view showing a partial thickness flap reflection with transitional implants medial to the recipient surgical sites. Temporary implants were placed initially to prevent pressure from the denture on underlying tissues. **2c** Harvested FGG was split into two pieces. **2d** Buccal view showing the FGGs sutured around the implants. The implant carriers were shortened outside the mouth to accommodate the denture. The acrylic skirt was fabricated around the implant carriers at the time of surgery and secured with screws. **2e** Occlusal view showing the acrylic surgical stents over the implant carriers in place securing the FGGs. Note the extension of acrylic on the lingual surfaces where sutures were not possible. **2f** Healing at 6 months shows a wider and thicker band of KT around the locator abutments.

in a variety of cases. Although many factors play important roles in the success of the grafting procedure, graft stability at the recipient site is critical. A FGG must be immobilized as any movement could compromise vascularization and impair healing.<sup>12</sup> In this report, we present two cases where FGG security was enhanced with acrylic or composite stabilization devices. In addition to suturing, graft stability was secured over the surgical bed by using customized acrylic or composite stabilization stents attached to implant carriers.

## Clinical Presentation

Two Caucasian females 63 and 90 years old, respectively, presented to the Graduate Periodontics Clinic at University of Detroit Mercy School of Dentistry with inadequate KT around dental implants after second stage surgery. They both signed informed consent forms for treatment.

## Case Management

### Case 1

A 63-year-old female presented to the Graduate Periodontics Clinic in 2013 with minimal KT and persistent inflammation 5 months after second stage surgery (Fig. 1a). The recipient sites were prepared with a partial thickness flap (Fig. 1b). A large FGG was harvested from the palate (Fig. 1c). Two fenestrations were made in the graft (Figs. 1c and 1d) to allow placement around implants #22 and 27 and sutured with 5-0 chromic gut (Fig. 1e). The carriers were initially placed on implant analogs and shortened by cutting with a bur to the

level of the stent and the intaglio surface of the stent was hollowed out to provide space for the graft. (Fig. 1f). The stent was removed at the 2-week follow-up based on normal clinical protocol. Two- and 8-week follow-up revealed normal healing (Fig. 1g) and a widened zone of healthy KT (Fig. 1h).

### Case 2

A 90-year-old female presented to the Graduate Periodontics Clinic in 2014 with minimal to no KT around two dental implants placed in the mandible to support an overdenture (Fig. 2a). Temporary implants were placed at the time of implant surgery to prevent pressure on soft tissue and underlying bone grafts. Partial thickness flaps were prepared around both implants (Fig. 2b). A FGG was harvested from the palate, split into two pieces, perforated in the center, and draped over each implant (Fig. 2c). Grafts were

sutured with chromic gut on the buccal aspect. The carrier was shortened with a bur outside of the mouth, layered with flowable composite, and tried onto the implants before recipient site preparation. This allowed for adjustments to the intaglio surfaces before preparation of the recipient sites. Additional adjustments were made after the FGG was sutured into place. The carriers were screwed onto the implants with finger pressure until slight contact was noted on the graft (Figs. 2d and 2e). The stent was removed at the 2-week follow-up based on normal clinical protocol. The patient continued to wear her denture during the healing period, which was supported by transitional dental implants. Transitional implants were removed 15 weeks after FGG placement. Healing was uneventful at all follow-up visits and at 6 months, an increased zone of healthy KT was present around both implants (Fig. 2f).

## Clinical Outcomes

Increased KT width and thickness was achieved around dental implants in both cases. Soft tissues remained healthy over time with no adverse outcomes.

## Discussion

Although KT is not absolutely necessary for implant success,<sup>13</sup> it is desirable, as it improves patient comfort and is associated with less gingival inflammation than non-KT.<sup>4-6,14</sup> FGG stabilization is essential for adequate

vascularization and healing.<sup>12</sup> Unfortunately, FGG stabilization at dental implant sites can be difficult, especially in areas with limited vestibular depth or access for suturing. Although Oh et al. (2017) demonstrated that it is possible to obtain 2.2 to 3.3 mm of keratinized mucosa around dental implants without the use of stabilization stents,<sup>15</sup> they acknowledged that it can be difficult in areas with a shallow vestibule. This report highlights two separate methods of stabilizing FGGs using customized acrylic or composite stents attached to implant carriers. Although others have used relatively similar techniques for soft tissue augmentation,<sup>7,8</sup> few have shown as many different approaches to accomplish the same goal. In a case report from Loma Linda,<sup>7</sup> an intraorally polymerized acrylic stent was fabricated to secure an allograft in an edentulous mandible. The techniques used in our cases alleviated the need for laboratory fabrication. The acrylic and composite stents in this case report firmly secured the FGGs and were easily fabricated before or during the appointments for single and multiple units. Application of stents resulted in adequate stabilization of FGGs, increased KT, and successful soft tissue augmentation in both cases. This case report provides viable alternatives for predictable soft tissue augmentation around single or multiple dental implants.

## Conclusion

The customized acrylic or composite stents allowed adequate stabilization of the FGGs. ■

## Summary

<p><b>Why are these cases new information?</b></p>	<ul style="list-style-type: none"> <li>■ Little data available on use of this technique with free gingival grafts.</li> <li>■ Shows a technique using two different stent materials to stabilize free gingival grafts.</li> <li>■ Shows stent fabrication and use for FGG stabilization around single and multiple implants.</li> </ul>
<p><b>What are the keys to successful management of these cases?</b></p>	<ul style="list-style-type: none"> <li>■ Proper preparation of the recipient site and proper fabrication of the stabilization stent.</li> </ul>
<p><b>What are the primary limitations to success in these cases?</b></p>	<ul style="list-style-type: none"> <li>■ Either composite or acrylic and/or implant analog must be procured.</li> <li>■ Extra time (in-office) is needed to fabricate a stabilization stent.</li> </ul>

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