Foremost, adequate bone must exist (or be built) to allow for proper implant positioning in 3 dimensions.

**CASE REPORT**

A modification of an approach introduced by Stein and Nevins (our version of guided gingival growth [GGG]) was performed by making a palatally oriented crestal incision, raising a full-thickness flap, replacing the cover screw with a temporary healing abutment (THA), and then covering the THA fully (or partially) with what is essentially an apically positioned flap (or at least a labially positioned one), which is secured with secondary intention. The healing abutment acts as a strut beneath the flap, creating a protected dead space on the buccal side of the implant for tissue regeneration.

Following the formation of a clot, connective tissue fills the gap and creates supportive...
Guided Gingival Growth...
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mucosa. For GGG, use of a 2- or 3-mm tall healing abutment is sufficient, and it is preferable to position the edge of the flap to cover at least half if not all of the THA. This ensures adequate blood supply and curtails exposure of the bone, which could stimulate resorption. Note that GGG is used for minor soft-tissue deficits. Indeed, positioning of the flap edge very close to the labial border of the healing abutment (or beyond apically) may be counterproductive, as this exposes much of the ridge around the palatal and interproximal aspects of the implant, which may lead to hard- and soft-tissue recession around the fixture and the adjacent teeth, especially in the papillary sites.

When utilized as recommended, the amount of buccal augmentation achieved by GGG as seen from the occlusal aspect may be up to 3 to 4 mm, though this may vary based on the height of the THA and existing mucosal thickness. Because there are no vertical incisions made in the technique, the level of keratinized mucosa expansion as seen from the labial view is limited, but may be at least 1.0 mm. The apicocoronal height of soft tissue attained at the time of surgery may simply equal the THA height plus the thickness of the newly positioned mucosa, but the final dimension reached after restoration is

**Positioning of the flap edge very close to the labial border of the healing abutment may be counterproductive....**

**Figure 8a.** Soft-tissue healing at 3 months after implant placement. Soft-tissue augmentation was necessary in order to idealize gingival aesthetics.

**Figure 8b.** Diagram of the bony and soft-tissue anatomy the day of second-stage surgery.

**Table 1. Criteria for Aesthetic Implant Treatment**

<table>
<thead>
<tr>
<th>Adequate Bone (minimum dimensions needed)</th>
<th>Adequate Soft Tissue</th>
<th>Reasonable Crown Contact Points *</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Buccal to implant: 2 mm²</td>
<td>• Papillary height and buccal thickness matches surrounding teeth</td>
<td>• Between implant and tooth: 5 mm or less distance from contact point to crest of bone³</td>
</tr>
<tr>
<td>• Lingual to implant: 1.0 mm</td>
<td>• Keratinized mucosa (2 mm) on buccal for color match, resistance to inflammation, improved plaque control due to patient comfort¹³</td>
<td>• Between implant and implant: 4 mm or less distance from contact point to crest of bone¹</td>
</tr>
<tr>
<td>• Between implant and tooth: 3 to 4 mm for papillary support² to at least 1.5 mm to offset natural formation of biologic width</td>
<td>• Between 2 implants: 3 to 4 mm to offset natural formation of biologic width; may want 5 mm to support papilla³</td>
<td>*Note that the distances mentioned in this column are based on averages attained. The patient’s natural papilla may be longer or shorter.</td>
</tr>
</tbody>
</table>
and more complicated There are several alternate methods for modification of the soft tissue at the second stage, including, but not limited to, connective tissue graft placement (see Table 1) and prosthetic contours influence the efficacy of GGG. The thicker the bone and mucosa are, the more predictable the outcome.

Use of GGG occurs at the second stage (fixture uncovering), but the decision to implement it may be decided upon at implant placement. If bone grafting is required at that time, and/or there is a modest lack of mucosal width (buccal, keratinized) or height present or anticipated after healing, then placement of a fixture cover screw and primary closure of the surgical site is justified. Primary closure permits undisturbed vascularization and regeneration; therefore, a better quality of tissue is available for handling at the second stage. The advantages, indications, minimum prerequisites needed, and adjunct therapies for GGG are found in Table 2. There are several alternate and more surgically complicated methods for modification of the soft tissue at the second stage, including, but not limited to, connective tissue grafting, the modified roll technique, and conventional apically positioned flaps. The long-term impacts of these procedures are questionable based on current scientific evidence. However, comparatively speaking, the connective tissue graft placement appears to be the most effective therapy, but this technique introduces greater patient morbidity.9,10

<table>
<thead>
<tr>
<th>Table 2. Guided Gingival Growth (GGG) Analysis</th>
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</thead>
<tbody>
<tr>
<td><strong>Advantages</strong></td>
</tr>
<tr>
<td>• Performed during second-stage procedure (time-convenient)</td>
</tr>
<tr>
<td>• Relatively conservative surgically</td>
</tr>
<tr>
<td>• No secondary donor site</td>
</tr>
</tbody>
</table>

**IN SUMMARY**

GGG is a conservative, efficient, and relatively straightforward treatment for mild soft-tissue deficits. When applied within its limitations, it may be a valuable tool for aesthetic refinement around dental implants.6

**References**


Dr. Sonick, a Diplomate of the International Congress of Oral Implantology, is an internationally known authority in the field of dental implantology and periodontology. He is a frequent guest lecturer in the international program at New York University School of Dentistry and the University of Connecticut School of Dental Medicine. He is the co-editor of the multi-language textbook, Implant Site Development, and serves on the editorial boards of numerous journals. He can be reached via email at mike@sonickdmd.com.

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