Two-stage esthetic crown lengthening

By Michael Sonick, DMD, Stephen Rothenberg, DMD and Debby Hwang, DMD

A smile that is perceived as unattractive mars confidence, sociability and self-regard. For some patients, the lack of visual appeal stems in large part from a "gummy smile," which a layperson begins to consider disharmonious when there is 5 to 7 mm of gingiva displayed.1 Management of such a complaint often entails both periodontal and restorative therapy, if not also orthognathic surgery and facial plastic procedures.

The following report showcases two-stage esthetic crown lengthening and prosthodontic rehabilitation for the treatment of a gummy smile.

Patient history
A medically and periodontally stable 40-year-old female presented with excessive, asymmetric gingival display of 5 to 7 mm upon smiling, short clinical crowns and incisal wear from tooth #4 to #15 (Figs. 1, 2).

Due to attrition and the relationship between the dentition and periodontal drape, the anterior teeth appear square-shaped and "masculine."2,3 The patient also presented with excessive, asymmetrical cephalometric radiographs (Fig. 3).

Diagnoses included (1) Coslet Type Ia altered passive eruption, evidenced by a wider-than customary dimension of keratinized gingiva and an alveolar crest at least 5.5 mm apical to the cemento–enamel junction (CEJ); and (2) vertical maxillary excess.2,3 The patient also shows a thick tissue biotype.

Treatment plan
• Consult with oral and maxillofacial surgeon regarding orthognathic surgery
• Consult with facial plastic surgeon regarding lip lowering therapy
• Consult with restorative dentist regarding ideal tooth shape set-up and fabrication of surgical guide
• Two-stage esthetic crown lengthening from tooth #4 to #15
• First stage: osseous recontouring
• 6-week healing period
• Second stage: gingivectomy
• 5-month healing period
• Final porcelain veneer restorations for teeth #4 through #15
• Delivery of maxillary occlusal bite guide

Treatment plan rationale
Ideal treatment for the patient with vertical maxillary excess embraces a host of dental and medical specialties. In such a case as this, in which the patient demonstrates up to 7 mm of gingival display, LeFort I maxillary impaction may further refine results if con- venient crown lengthening insufficiency elevates the periodontal margin, creates an unacceptable crown-to-root ratio or precludes achievement of a natural-looking emergence profile due to exposure of excessive radicular structure.5 Likewise, neuromuscular relaxation of the upper lip by botulinum toxin type A (BTX-A) depresses the lip, and thus masks any mucosal surplus left after periodontal surgery.4

As the patient declined orthognathic and facial plastic therapy, the treatment rendered to alleviate her gummy smile and restablish tissue and dental symmetry included a two-stage crown lengthening procedure followed by delivery of porcelain veneers from tooth #4 to #15.

A biphasic crown lengthening approach mini-mizes the 1 to 5 mm coronal gingival shifts common after one-stage procedures detected especially in patients with thick soft tissue biotypes (such as the patient featured in this report).5 By first reshaping only the osseous crest and letting healing commence, it is possible to correct any coronal re-bound of the soft tissue seen after healing at the second, gingivectomy-only, surgery. Once the attachment apparatus fully remodels post-gingivectomy, which takes roughly three months, final restorations may be cemented.

Restorative consult
From the diagnostic models, the patient's prosthodontist created an ideal dental wax-up, upon which a vacuum matrix was applied to generate a surgical guide (Figs. 3, 4).

Osteotomy was performed using an Ochsenbein chisel, carbide finishing bur and Neumeyer bur to position the alveolar crest at least 5 mm from the anticipated restorative margins at each site, as verified by the surgical guide (Fig. 6).

The bone was grafted so that sharp edges or bony areas existed, and positive architectures were preserved. The flaps were replaced and secured in sling fashion with 4-0 expanded polytetrafluoroethylene (ePTFE) (Fig. 7). The gingiva appeared sim-ilar to that found before surgery, even 10 days after intervention (Fig. 8).

Gingivectomy (second stage)
Once the soft tissue resitsl six weeks post-osteotomy (Fig. 9), the second stage of biphasic crown lengthening of teeth #4 through #15 was executed. The patient was sedated and anesthetized as above.

A definitive external bevel gingivectomy of teeth #4 through #15 was performed with a #15 scalpel utiliz-
In order to correct lip line asymmetry and further diminish gingival display, neuromuscular-ocular lip correction (lowering) with BTX-A was reconsidered, but the patient did not pursue treatment. Six years after veneer placement, the patient remained satisfied with the functional and esthetic result achieved solely through periodontal surgery and prosthetic rehabilitation (Figs. 15, 14).

Postoperative instructions
After each surgical procedure, the patient was instructed to take 600 mg of ibuprofen every 4–6 hours, hydrocodone 7.5 mg/acetaminophen 750 mg every 4–6 hours as needed for pain and 100 mg of dexamethasone a day for 10 days.

The patient was instructed not to brush at or near the surgical site but instead to rinse with 0.12 percent chlorhexidine or warm saline twice daily. The patient was also directed not to chew in the affected area for at least two weeks.

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