Two-stage esthetic crown lengthening

By Michael Sonick, DMD, Stephen Rothenberg, DMD and Debby Hung, 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 Treatment plan rationale

Patient history

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

Patient story

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 of teeth #4 to #13 (Figs. 1, 2).

Due to attrition and the relationship between the denition and periodontal drape, the anterior teeth appear square-shaped and “masculine.”

Diagnoses included (1) Cosmetic Type I A altered passive eruption, evidenced by a wider-than-cus- tomary dimension of keratinized gingiva and an alveolar crest at least 1.5 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
  1. 6-week healing period
  2. Second stage: gingivectomy
  3. 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 dem- onstrates up to 7 mm of gingival display, LeFort I maxillary impaction may further refine results if con- ventional crown lengthening insuffi- ciently elevates the periodontal margin, creates an unacceptable crown-to-root ratio or precludes achievement of a natural-seeming emergence profile due to exposure of excessive radicular structure.3

Likewise, neuro- muscular relaxation of the upper lip by botulinum toxin type A (BTA-A) depresses the lip, and thus masks any mucosal surplus left after peri- odontal surgery.4 As the patient de- clined orthognathic and facial plastic therapy, the treatment rendered to al- leviate her gummy smile and reestablish tissue and dental symmetry included a two-stage crown lengthening procedure followed by de- livery of porcelain veneers from tooth #4 to #15.

A biphasic crown lengthening approach mini- mizes the 1 to 5 mm coronal gingival shifts com- mon after one-stage procedures detected especially in patients with thick soft tissue biotypes (such as the patient fea- tured in this report).5

By first reshaping only the osseous crest and letting healing commence, it is possible to cor- rect any coronal re- bound of the soft tis- sue seen after heal- ing at the second, gingivectomy-only, sur- gery. Once the attachment appara- tusa full remodeling of the gingivectomy, which takes roughly three months, final restorations may be cemented.

Restorative consult

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

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 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 aesthetic 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 doxycycline 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 0.02 percent minocycline for 600 ppm fluoride twice daily. The patient was also directed not to chew in the affected area for at least two weeks.

Suture removal occurred at 10 to 14 days post-surgery. CT imaging 10 to 14 days post-surgery. CT scans of the maxilla showed no evidence of resorption or intrusion of the root apices. The patient was also directed not to chew in the affected area for at least two weeks.

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References