Surgical crown lengthening for aesthetics—aka ‘the gum lift’

Correctly diagnosing the need for gingival surgery should not be overlooked as a less important part of smile improvement. Here’s an example of how to perform the procedure with a predictable technique that promotes rapid healing.

Don’t ignore gingivae!

Smile design, golden proportions, embrasure form, labial anatomy—just some of the terms used in so many of the articles published in journals today. Cosmetic dental education is so popular because patients are asking dentists for this type of work. As a result, dentists have to understand the latest techniques and materials to exceed their patients’ increasingly high expectations.

Many after-shots of cosmetic dentistry are published in the press and very often one aspect of an otherwise excellent case leaps out—‘Why did no-one treat the gingivae?’

The gingival aesthetics

Healthy, pink, well-contoured, symmetrical gum tissue complements and frames the teeth. Patients may describe how they wish to change the aesthetics of their teeth not their gums but what patients really want is a great smile. In over 50 per cent of all cosmetic procedures we undertake, crown lengthening is involved. This figure is not surprising, many clients’ aesthetic concerns are related to poorly aligned/crowded teeth; a protruding central will almost certainly have a gingival margin that is more apical than a tooth that is retroclined due to the relative positions of the crestal bone and thickness of the gingiva.

Classic smile design describes ideal gingival aesthetics as:

1. Lip line at or just above the gingival margin when smiling wide.
2. Symmetry between the upper central incisors.
3. Canines and central incisors have gingival margins at the same level when looking from the front.
4. Lateral incisors ideally 1–1.5 mm below the level of centrals and canines, although it is acceptable if the levels are the same.

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Contouring v lengthening

Diode lasers have made gingival contouring procedures quicker and cleaner than ever, but their use must be properly planned to respect the underlying crestal alveolar bone.

When planning how much tissue can be removed with gingival contouring alone, the clinician must bear in mind that there should be 3mm between the gingival or restorative margin (which ever is more apical) and the alveolar crest.1 This is referred to as the biological width. Exposing the bone can lead to tenderness of the periodontal tissues. In patients with thick gingival, an unsightly ‘angry red’ appearance will develop due to the chronic inflammation and hyperplasia. Where the gingiva is thin, the result is more likely to be resorption of crestal bone and associated recession of the gingival tissues with exposure of restorative margins. In a patient with a high lip line, either outcome would be a disastrous failure. Refining the zenith

The ability to use electro surgery and, especially, lasers to cleanly perform gingival contouring has resulted in clinicians being taught to refine gingival outline/ reposition gingival zeniths on the same day as preparation. When the case is fitted, the tissue appears very healthy and stable.

Ultimately the gingiva has been shown to grow back to the original position as the individual’s biological width is re-established.

Figure 3 shows the situation we usually find when a flap is raised. The alveolar bone is not smooth and the peaks and troughs in the crestal bone are reflected in the gingiva.

If probing in just one location, the probe may contact a peak or a trough in the crestal bone, resulting in a reading that is higher or lower than the ‘average’ position of the bone surrounding that tooth. For example, you may probe to bone and read 4.5mm off the probe when really the bone is at 3.5mm. This could result in gingival contouring alone being undertaken when really crown lengthening was necessary to achieve the desired gingival position.

A case study: crown lengthening and 10 veneers

Presenting complaint

This 52-year-old female attended the clinic for cosmetic dental treatment. Her concerns were the irregularity of the teeth and the ‘gummy’ appearance of her smile on the left side.

Diagnosis

A full clinical and radiographic examination was performed—this article will only address the next most dramatic and powerful changes that we make and the clients are simply amazed by the results. (Fig. 2)

Crown lengthening procedure

From the study models, diagnostic wax-up and imaging we determine where we would idealise the position of the gingival margins. Some advocate the use of a clear silent to help visualise the waxed-up position of the gingiva in the mouth.2 We prefer to use digital microscopy (we find them more accurate in our hands) to communicate and verify the desired levels of the gingiva and crestal bone. The use of the stick bite (Fig. 6) is very helpful in visualising the desired horizontal plane, even when the patients’ eyes are obscured by DVD headsets or dark glasses.

Figure 7 shows marks having been placed at the desired position of the new gingival zenith. The symmetry between the left and right sides can now be visualised.

The laser (Diolase ST) is then used to contour the gingiva to the required position. We now also use the calipers (Dentagauge/ erskine DENTAL) to record the distance from the incisal edge to the gingival zenith (Fig. 8). The principles of biological width now mean that this distance (13mm) plus 3mm (16mm) is where we need to position the crestal bone via osseous contouring.

We now need to raise a full thickness flap, sufficient to allow easy access to and visualisation of the alveolar bone (Fig. 9). We tend to avoid the use of any re- structuring incisions due to the scarring that can result.

Another common client concern is the ‘gummy smile’ (Fig. 1). A combination of crown lengthening and veneers in these patients can be one of the most dramatic and powerful changes that we make and the clients are simply amazed by the results. (Fig. 2)
The bone is then contoured to the desired position using a bur. We leave a very thin wafer of bone covering the root and then remove this last portion with a Hollenbach carver, as shown in Figure 10. This helps to prevent any damage to the root surface from the bur. We also will often thin the buccal thickness of the bone for two main reasons. Firstly, thick or bulbous bone can cause the lip to ‘ride up’; secondly, leaving thick bone at the margin can cause the gingivae to re-grow beyond the 5mm point. This is because the biological width is really a biological volume.

The amount of bone removed is determined by adding 5mm to the previous measurement, thereby creating the correct biological width. As can be seen in Figure 11, this distance is confirmed with the callipers.

This procedure is repeated on all the teeth planned for crown lengthening. The flap is then replaced and sutured into position. (Fig. 12). To avoid unsightly knots being visible labially and to minimize any knots palatally, we use a continuous suture. Once the sutures are completed we place some gauze over the flap and apply gentle pressure for up to 20 minutes. This helps prevent any blood ‘pooling’ under the flap and encourages primary fixation. Detailed, written after-care instructions and oral hygiene aids such as soft brushes, Eladrid (chlorhexidine) mouthwash and Corsodyl gel are given.

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