Esthetic gingival recontouring—A plea for honesty

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There continues to be a tremendous amount of confusion in the dental literature and among practitioners regarding the diagnosis and treatment of gingival discontinuities. The purpose of this article is to present a rationale for gingival recontouring, illustrated by a case report. A patient requested gingival recontouring. Because the preoperative evaluation was inadequate, a simple gingivectomy procedure was performed. After healing, the tissue had rebounded to its preoperative levels. The patient was then evaluated more comprehensively, and gingival recontouring was accomplished with a mucoperiosteal flap and osseous recontouring. The tissue subsequently healed at the correct position and remained stable. To reliably perform gingival recontouring procedures, the dentist must have a clear understanding of the biologic width. By using diagnostic bone sounding, the practitioner can determine the appropriate surgical procedure that will ensure an esthetic and stable postoperative result. *(Quintessence Int 2000;31:553–556)*

Key words: biologic width, bone sounding, crown lengthening, esthetics, gingival recontouring, gingival surgery

During the past 20 years, there has been a tremendous increase in the emphasis on dental esthetics. This new era in restorative dentistry was made possible by the dental scientists who developed adhesive technology and materials. Understanding of the adhesive interfaces of enamel, dentin, and porcelain enabled anterior restorations so natural that they defied detection. The next step in the esthetic dentistry revolution was a greater emphasis on the beauty and symmetry of the soft tissues surrounding the lifelike porcelain restorations.

Dentists continue to struggle with gingival esthetics today. The profession has become enamored with the concept of gingival recontouring. The literature is replete with articles that describe a cosmetic restorative case with a brief mention of the preliminary gingival recontouring. The problem is that the authors commonly provide no diagnostic criteria or treatment rationale for their gingival recontouring procedures. This misinformation leads to confusion among practicing clinicians who are attempting to provide state-of-the-art therapy for their patients. It is the purpose of this article to provide a logical diagnostic and treatment approach to the management of gingival issues.

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In 1961, Gargiulo and others[1] provided the profession with the classic histologic study on the dentogingival attachment apparatus. This oft-quoted study defined the average dimensions of the sulcus, epithelial attachment, and connective tissue attachment. In 1977, Ingber et al[2] discussed the relationship between the periodontium and the margin of the restoration. They termed the distance from the alveolar crest to the base of the sulcus the *biologic width,* based on the work of Dr D. Walter Cohen. This concept has withstood the test of time, and the term is used almost universally today. In 1980, Maynard and Wilson[3] described this area from the alveolar crest to the margin of the restoration and termed it the *physiologic dimension.* More recently, Kois[4,5] has elegantly described this relationship in simple and understandable terms. Yet, there is still a tremendous amount of confusion surrounding this very important 3 mm of human anatomy.

It is self-evident that esthetically driven periodontal surgical procedures should only be accomplished in the presence of gingival health. However, the key element that determines the position and contour of the gingival margin is the position and contour of the underlying alveolar bone. Kois[6] has described this relationship using the terms *normal crest, low crest,* and *high crest.* The normal crest relationship is a distance of 3 mm from alveolar crest to gingival crest when measured midfacially on a maxillary anterior tooth; this relationship occurs approximately 85% of the time. In the low crest situation, this distance is more than 3 mm; this occurs approximately 13% of

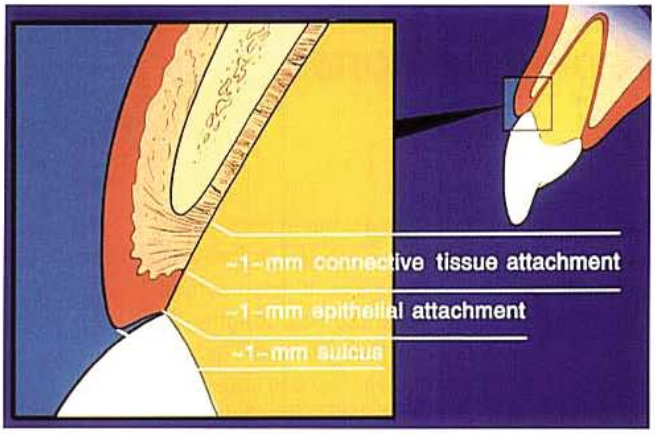

Fig 1 Average biologic dimension.

Fig 2a Preoperative view showing lower gingival levels on the maxillary right anterior teeth.

the time. Finally, the high crest relationship is a distance of less than 3 mm from alveolar crest to gingival crest, which occurs approximately 2% of the time.

Thus, in the vast majority of patients, the distance from the alveolar crest to the gingival crest, measured midfacially on the maxillary anterior teeth, is approximately 3 mm.[4-6] This can be roughly divided into 1 mm of connective tissue, 1 mm of epithelial attachment, and 1 mm of gingival sulcus (Fig 1). This distance is measured by first anesthetizing the gingiva and then inserting the periodontal probe into the sulcus and pushing it apically until the tip engages the alveolar bone. This procedure is termed *bone sounding.*

The 3-mm distance (normal crest) is what nature requires, in the majority of the population, for gingival health and stability. If bone sounding reveals that the distance from gingival crest to alveolar crest is 3 mm, it is not possible to remove any gingival tissue with a simple gingival recontouring procedure, which would result in a postoperative distance of less than the required 3 mm. In this circumstance, when tissue is removed with a simple gingivectomy, the tissue will predictably grow back to the preoperative 3-mm dimension. If a restoration margin is placed at the gingival crest immediately after the gingivectomy, the tissue will attempt to grow back to the preoperative position. If the margin of the restoration is less than 2.0 to 2.5 mm from the alveolar crest, a biologic width impingement will have been created, resulting in chronic gingival inflammation.

When gingival tissue recontouring is required, it is imperative that the dentist determine the existing relationship of gingival crest to alveolar crest with bone sounding. If the distance is 3 mm or less, the gingivectomy procedure must be followed by osseous resection.[7,8] This is generally accomplished by elevating a mucoperiosteal flap and removing alveolar bone on the facial surface from the mesiofacial line angle to the distofacial line angle with high-speed burs and hand chisels. Enough bone is removed to ensure that the postoperative distance from gingival crest to alveolar crest is 3 mm. This will generally result in a stable gingival complex that migrates neither coronally nor apically.

In the uncommon circumstance in which the distance from gingival crest to alveolar crest is greater than 3 mm (low crest), gingival tissue can be removed with a simple gingivectomy, followed by a circumferential fiberotomy. For example, if the measurement is 4 mm from gingival crest to alveolar crest, then 1 mm of gingival tissue can be removed with a simple gingivectomy, resulting in the required postoperative distance of 3 mm. A sulcular incision is then made from the gingival crest to the alveolar crest to incise the attachment apparatus. The healed gingival tissue will be stable in its new position.

CASE REPORT

A 26-year-old woman presented with a chief complaint of uneven gingival margins; the gingival crests were 1 mm more coronal on the maxillary right anterior teeth than on the left side (Fig 2a). The patient was not evaluated correctly, and a simple gingivectomy procedure, which removed 1 mm of marginal gingiva on the maxillary right anterior teeth, was performed (Fig 2b).

At the 2-week postoperative appointment, it was apparent that the tissue had grown back to the preoperative levels (Fig 2c). At this time, a more thorough evaluation was accomplished. The explorer was used to determine whether the cementoenamel junction could be felt in the gingival sulcus on the maxillary right central incisor. Because the cementoenamel junction could not be felt, a diagnosis of altered passive eruption was made.[7,8]

Fig 2b Gingivectomy performed to level gingival margins.

Fig 2c Postoperative view revealing tissue rebounding to pre-operative levels.

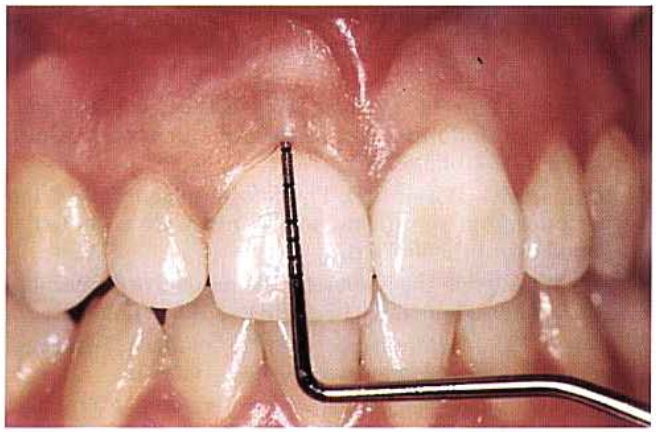

Fig 2d Periodontal probe bone sounding to the alveolar crest.

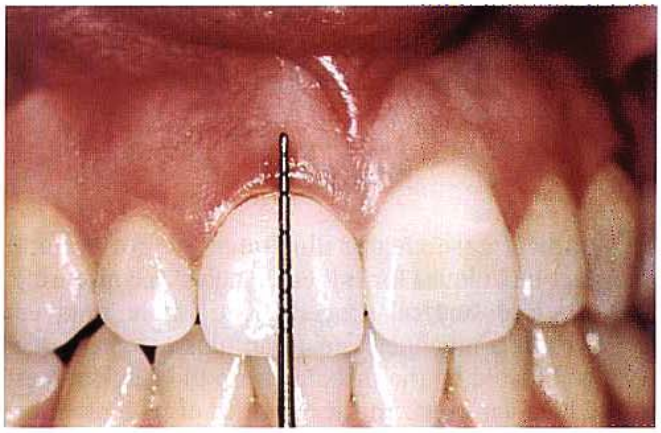

Fig 2e Periodontal probe demonstrating the 3-mm distance from the gingival crest to the alveolar crest.

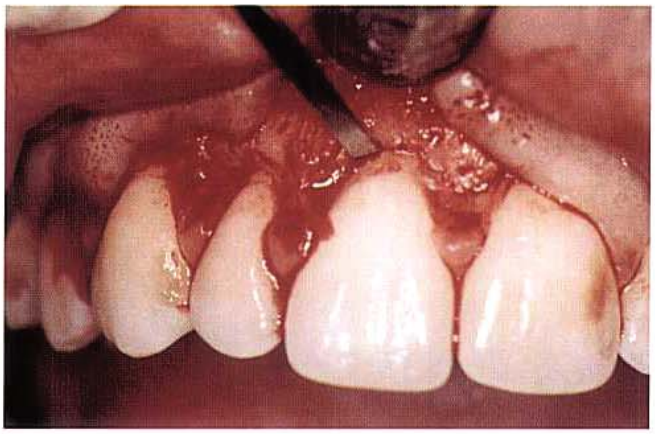

Fig 2f Second surgery, involving a mucoperiosteal flap and osseous resection.

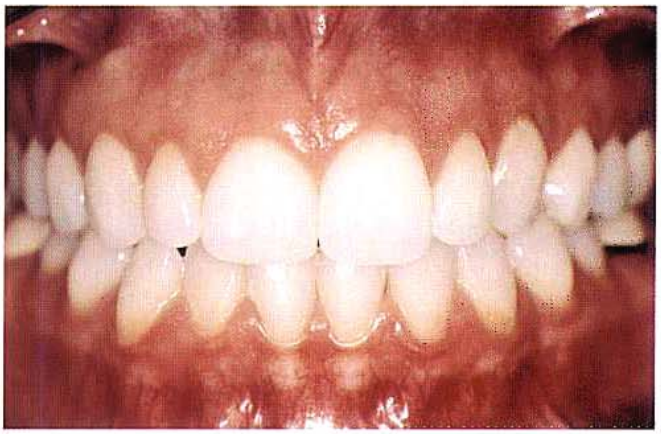

Fig 2g Twenty-eight–month postoperative view demonstrating a stable postoperative result.

The next diagnostic step was to measure the distance from the gingival crest to the alveolar crest, in order to determine the indicated surgical procedure. The gingiva was anesthetized, and bone sounding was performed. The distance from the gingival crest to the alveolar crest on both maxillary central incisors was 3 mm (Figs 2d and 2e). The tissue had rebounded to its original presurgical dimension of 3 mm. The tissue remained stable at this position for approximately 1 year.

Subsequently, a second surgery was performed. It consisted of a 1-mm gingivectomy coupled with a mucoperiosteal flap and 1 mm of osseous resection (Fig 2f). The tissue healed in the correct position and has remained stable for 28 months (Fig 2g). However, the surgically corrected gingival contour does not perfectly mirror the gingival contour of the adjacent central incisor. The contour of the alveolar crest ultimately determines the final gingival contours. Therefore, the alveolar crest, after ostectomy, must exactly mirror the desired gingival contour.

DISCUSSION

This clinical case clearly illustrates the correct and incorrect techniques for esthetic gingival recontouring. The required surgical procedure, a simple gingivectomy versus a mucoperiosteal flap plus osseous resection, is dictated by the distance from the gingival crest to the alveolar crest. In the majority of patients (normal crest), the simple gingivoplasty or gingivectomy will not provide predictable, long-term gingival recontouring. The instrument used to accomplish the gingival recontouring–knife, electrosurgery, or laser–has no impact on the surgical outcome. The result is dictated by the level of the underlying alveolar crest.

CONCLUSION

It has been the purpose of this article to provide a diagnostic rationale for gingival recontouring. It is imperative that authors of articles and educators who lecture on the subject of gingival esthetics be held to a higher standard. First, when gingival recontouring is described, the preoperative dimension of the gingival crest to the alveolar crest must be reported. Second, a 1-year postoperative photograph must be provided to confirm the long-term stability of the postoperative result. If the profession demands this higher level of accountability, the confusion caused by the current generation of misinformation should diminish.

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