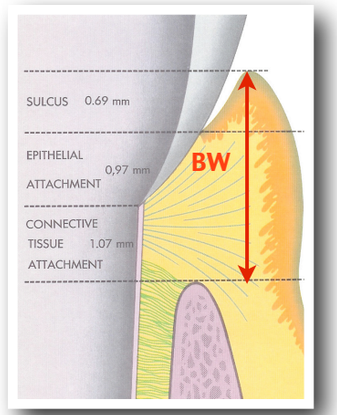
Understanding Biologic Width

Biologic width is the genetically predetermined distance that the gingiva maintains over the bone, from free gingival margin to osseous crest. It includes the depth of the sulcus, and the portion of the gingiva attached to the root. Although this dimension varies per patient, it is generally 3mm in thickness, as illustrated in the diagram below. About 1-2mm for the sulcus depth, and 1-2mm for the attached gingiva.

Biologic width is important. If the buffer of the sulcus and attached gingiva is violated by a restoration or caries, inflammation of the gingiva will occur and one of two things will happen:



1. The bone will retreat to make room for the gingiva to have freedom from the subgingival irritant leaving a pocket or uneven gingival margin.

2. The bone will stay fixed and the gingiva will stay irritated indefinitely leaving the gums unanesthetically red, puffy and easily bleeding.

Clinical Crown Lengthening

Clinical crown lengthening is the removal of bone and soft tissue from around a tooth in order to expose more of that tooth. This can be done for two primary reasons: aesthetics, or prosthetics. Although these two types of surgery have been categorized separately, primarily because prosthetic reasons for lengthening the teeth often result in non-esthetic results with uneven gingival margins, there are situations where prosthetically lengthening the teeth also provides a more esthetic outcome.

Anatomically, or aesthetically, lengthening teeth does not generally require the fabrication of a restoration post crown lengthening surgery.

Prosthetic, or functional, crown lengthening surgery is performed with the understanding that a new restoration, such as a full coverage crown or a veneer, will be used to restore the function of the tooth or teeth in question due to exposed roots or lost incisal tooth structure.

This issue of ProbeTips will **focus on anatomical crown lengthening and hopefully guide the clinician in referring patients when necessary**. In the next newsletter, prosthetically driven cases will be presented.

Pamela A Nicoara DDS MSD PLLC

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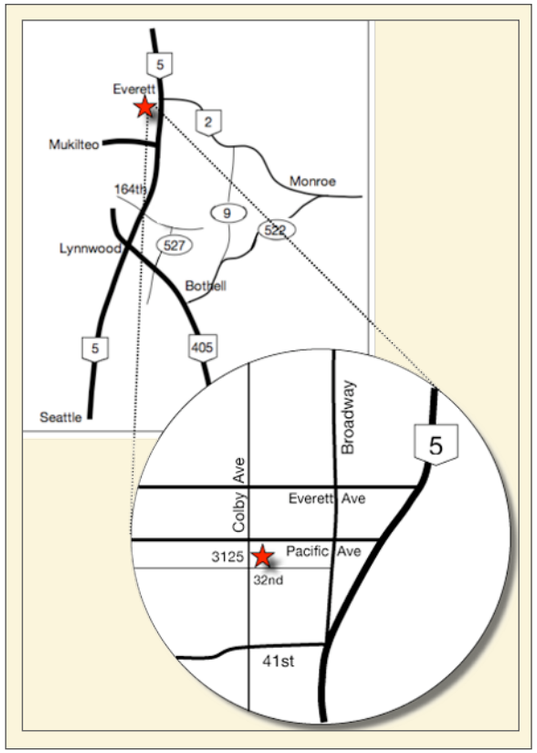

3125 Colby Avenue, Suite H
Everett WA 98201
T: **425-374-5380** F: 425-374-5382

www.NICOARAperio.com
doctor@NICOARAperio.com

Probe Tips

A Quarterly Periodontal Newsletter

By Pamela Nicoara DDS MSD

Anatomical Crown Lengthening

Volume 14, No. 2

August 2021

Anatomical Crown Lengthening

General Considerations

There are several factors which limit the use of clinical crown lengthening surgery in the face of more stable and predictable restorations like a fixed partial denture, or dental implants.

1. Crown : Root ratio
2. Root shape and surface area
3. Root trunk length to furcation entrances (lingual/palatal entrances are more apical)
4. Pristine healthy adjacent teeth
5. Aesthetic compromise

If any of the above parameters are impinged upon (i.e. the new crown length will be greater than the root length, the root is small or conical in shape, the entrances to furcations are very near the osseous crest, or support will be lost from adjacent healthy teeth which may also pose an aesthetic compromise), then it is appropriate to consider other restorative options listed above.

Anatomical Crown Lengthening

Problem: 'Gummy Smile'

General Causes: Altered tooth eruption, Super-eruption, Tooth wear, Short clinical crowns, Vertical maxillary excess (VME), Short upper lip, Hypermobile upper lip.

Diagnosis: A periapical film can show bone levels coincident with the CEJ indicating simple crown lengthening as the treatment of choice in the cases adjacent. Tooth wear often leads to compensatory super-eruption, so orthodontic intrusion would be a more organic option over crown lengthening and root exposure. VME can be confirmed by the orthodontist leading to orthognathic surgery. For short or hypermobile upper lip, plastic surgery may be required. Alternatively, some patients choose quarterly injections of Botox into the upper lip to reduce its mobility.

Treatment: Altered or super-eruption, or short clinical crowns can be corrected with crown lengthening. If roots of short crowns are exposed, then restorations on the root surface would be required.

Case No. 1: Altered eruption kept the bone levels coincident with the CEJ, instead of an average 3mm apical to the CEJ. Once bone levels are corrected, the newly sculpted gingiva will maintain their distance from the bone, usually about 3mm (i.e. Biologic Width). No restorations are required.

Case No. 2: Here, altered eruption has only affected a single tooth post orthodontics. Had the CEJ been more coronal than the adjacent tooth, then intrusion and incisal restoration would be necessary. Since the CEJs were level, no restorations are required.

Case No. 3: This case has a combination of altered eruption and hypermobile lip. Crown lengthening can achieve only so much to reduce excessive gingival display at full smile. Further improvement comes from quarterly botox injections, or plastic surgery to reduce lip mobility.

Case No 1. Before After

Case No 2. Before After

Case No 3. Before After

References

Clinical Periodontology and Implant Dentistry. Lindhe et al. 4th Ed. 2003.

Gargiulo, et al. Oral Surg Oral Med Oral Path. 1961.

Complete References Available on Request.

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