



BIOLOGIC SHAPING IN PERIODONTAL THERAPY

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Abstract

This article focuses on biologic shaping during periodontal treatment. This is especially important if there is concavity or unevenness of the enamel near the edge of the crown. This can create an unmanageable situation and increase the risk of further loss of bone support. The point is that biologic shaping in periodontal therapy limit unnecessary bone removal and create a biocompatible environment. Biologic shaping preserve bone, creating the biologic width necessary for tooth restoration. However, putting biological shaping into practice requires a team approach with a deep understanding of fundamentals, anatomy, surgical and reconstructive procedures, materials, and final reconstructive contours. When performed correctly, it can improve the long-term prognosis of dental health.

Keywords: *periodontal surgery, biologic shaping, periodontal resective and regenerative techniques*

Introduction

Periodontal surgery involves modification of hard and/or soft tissues to achieve a therapeutic goal. These goals include treatment of periodontal defects, including furcation involvement of molars, and crown lengthening procedures to facilitate restoration of a tooth or teeth. Traditionally, resective and regenerative techniques focus on osseous structures with little attention given to modification of tooth surface. Unfortunately, this could lead to excessive removal of the bone and/or creation of an environment that is not cleansable and biologically incompatible. Further, regenerative techniques can yield unpredictable results in furcation lesions thus predisposing molars to further attachment loss. Biologic shaping is intended to create a cleansable, biologically compatible root surface that is manageable by both patients and dentists/hygienists. Here modification of tooth surface is the primary focus with removal of the bone performed only when absolutely necessary to create a biocompatible environment. This chapter will focus on biologic shaping during the course of periodontal therapy. Biologic shaping was first reported by Melker and Richardson in 2001 and described for esthetic dentistry in 2003 ^{1, 2}. It combines periodontic and restorative phases of dentistry and aims to facilitate home care by patients using simple hygiene aids such as floss and a toothbrush, as well as facilitate professional maintenance by hygienists to remove plaque and calculus. It also creates biologically compatible dimensions necessary for the restoration of a tooth without infringement on biologic width. Further, biologic shaping removes tooth-derived risk factors such as developmental grooves, enamel projections and concavities. This is particularly important if a developmental groove, concavity, or enamel projection is in close proximity to an existing crown margin resulting in a void or retainment of cement in the groove (Fig.1).

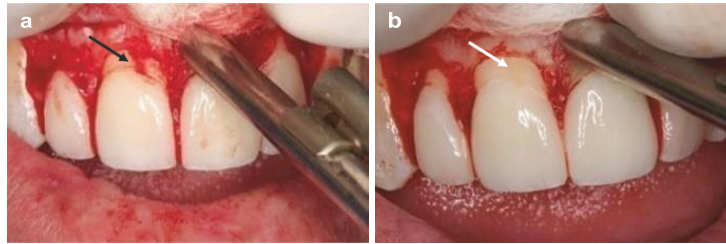


Fig. 1. Removal of developmental groove. (a) Developmental groove present on the right central incisor illustrating the problem when a margin finishes in a developmental groove (black arrow). There is a lack of adequate seal, and bonding material is located in the groove causing severe inflammation. (b) Removal of the developmental groove to allow for maintenance of the area (white arrow). This can create an unmanageable situation and increases risk of further attachment loss. Therefore, the ideal therapy will involve modification of tooth structure to eliminate these anatomical discrepancies and create a new restorative margin that is supragingival to the previous margin.

The point being that biologic shaping limits the unnecessary removal of bone and creates a biocompatible environment. Biologic shaping is an alternative to conventional crown lengthening surgery³⁻⁵. Crown lengthening utilizes the margins of an existing restoration or the cemento-enamel junction (CEJ) of a nonrestored tooth to gauge the amount of osteotomy necessary to reestablish the biologic width. Creating proper space ensures that a new margin will not impinge upon the attachment apparatus. This creates challenges in the furcation as removal of the bone in this region further compromises the tooth by creating an environment that is not cleansable for both the patient and the hygienist (Fig. 2).

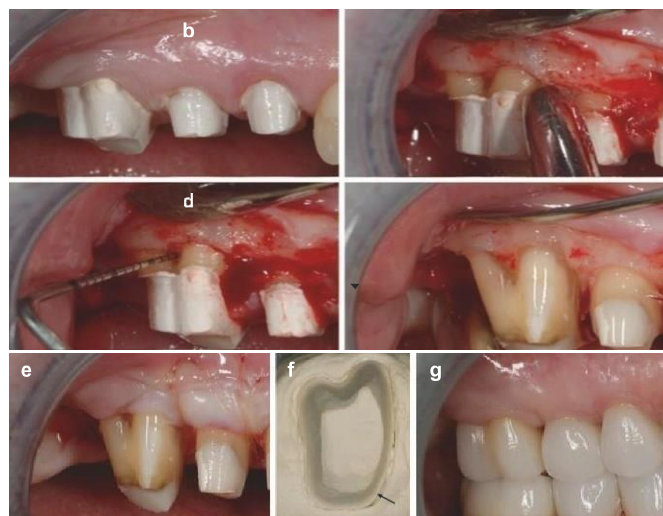


Fig. 2. This patient was referred for correction of biologic width invasion. Prior treatment involved removal of existing restorations and decay and placement of cores and provisionals. (a) Provisionals removed. Note Durelon cement still present on the teeth. Antimicrobial effects of this cement are protective. (b) Reflection of a full thickness flap followed by a partial thickness dissection apical to the mucogingival junction. (c) Of critical importance is the location of the existing margin approximating the furcation. In essence there is no space for the biologic width. (d) After biologic shaping 100% of the tooth structure is perfectly smooth from the bone to the occlusal surfaces. Note that there is absolutely no margin present after biologic shaping. Critical is the actual location of the bone in the furcation. Removal of furcation results in coronal movement of the bone (arrow). No matter how much bone is removed, space for the biologic width cannot be achieved. By removing the previous margin and allowing a new biologic width to establish, the new margin can be placed coronal to the gingival collar. (e) The flap is sutured with 5-0 chromic gut just coronal to the bone. Primary closure helps to decrease postoperative discomfort. (f) The day of impressions. A chamfer margin is placed with a 0.3 mm thickness and placed just coronal to the gingival collar (arrow). Note the large amount of tooth structure remaining. (g) Final restorations cemented. All margins are supragingival. The furcation on #3 is perfectly contoured to follow the shape of the underlying tooth structure. The barreling in of the furcation is extended to the occlusal surface. The material for these restorations is Feldspathic porcelain. This case has now passed the 15 year period of stability and function. Restorations by Dr. William Strupp Jr.

Thus, it is critical to preserve as much bone in the furcation area as possible. Therefore, rather than removing the bone away from the planned restorative margin, biologic shaping moves the restorative margin away from the bone, minimizing the amount by which the crown must be lengthened to establish biologic width. Table 1 lists the rationale for biologic shaping.

Table 1. Rationale for biologic shaping ⁵

1	Replacing or supplementing the current indications for clinical crown lengthening
2	Minimizing osteotomy
3	Facilitating supragingival or just slightly intrasulcular margins (when there is a dark substructure) to preserve the biologic width
4	Eliminating developmental margins
5	Eliminating previous subgingival restorative margins
6	Reducing or eliminating furcation anatomy, thus facilitating margin placement
7	Allowing supragingival or intrasulcular impression techniques
8	Removing all CEJs

When treating combined periodontal and restorative cases, the periodontist must facilitate creation of a final margin (supragingival or just into the sulcus), improve tissue health to facilitate an accurate impression, and provide an abundance of dense connective tissue for augmentation of keratinized gingiva to protect the underlying periodontal support (Fig.3).



Fig. 3. (a) Case with three teeth requiring new restorations with chronic inflammation present on the first premolar (white arrow). (b) Restorations removed and decay excavated. (c) Core buildup (DenMat (Lompoc, CA, USA) enamel shade core paste) adds restorative volume to the teeth and helps determine placement of the final restorative margins. Connective tissue graft in place on the first premolar (black arrow). (d) Final restorations fabricated with Feldspathic porcelain with margins placed supragingival. Healing of the connective tissue graft provides a thick band of keratinized tissue an elimination of the chronic inflammation (arrow). Note that the new crown margin on the first premolar is now supragingival to the previous crown margin. The case is now in function for 11 years. Restorations by Dr. William Strupp Jr.

The dense connective tissue is essential for taking accurate impressions and cementing final restorations as there is greater probability of chronic inflammation if the restorative margin approximates mucosa ⁴. For esthetic surgical procedures, the periodontist must provide ideal clinical anterior crown length to aid the restorative dentist in providing the highest level of esthetic treatment. The periodontist also must make every attempt to avoid black triangles as a result of periodontal surgery and support the restorative dentist by motivating patients to accept the comprehensive treatment plan.

Clinical Prerequisites and Steps

Successful treatment requires a team approach and a thorough understanding of macroand microanatomy, biology, and restorative materials. Incumbent upon the laboratory technician is to fabricate a restoration that follows the newly created tooth contours, otherwise a plaque and food trap will be created increasing the risks of further periodontal breakdown. When executed correctly, biologic shaping can provide patients with successful long-term outcomes. Clinical prerequisites and steps for success have been previously published and are summarized below ³⁻⁵.

1. All previous restorative materials and decay should be removed.
2. A core buildup of composite-bonded resin should be placed where necessary to add volume to the teeth. The core helps determine the placement of the final restorative margin.
3. Acrylic provisionals should be placed with Durelon (3M™, ESPE™; St. Paul, Minnesota, USA) as the temporary cement. This cement is recommended for its antimicrobial properties and ability to help decrease sensitivity.
4. Removal of provisional restorations at time of surgery to allow for better access.
5. Inverse bevel incisions and removal of a collar of gingival tissue. Otherwise, sulcular incisions without the removal of gingival collar if <2 mm of attached keratinized tissue is present. Split-thickness flap reflection permits visualization of

the core/tooth relationship to the bone.

6. Shape root and remove old margins as well as 360° of CEJs. Reduce or eliminate cervical enamel projections, concavities, developmental grooves, flutes, etc. facilitate ideal restorative emergence profile (flat is better than fat contours). Diamond burs are recommended for this process.
7. Correction of any reverse architecture and removal of the bone where violation of the biologic width will be anticipated.
8. If insufficient keratinized attached connective tissue is present at the surgical site, perform soft tissue augmentation to create a thicker gingival biotype and increase the zone of keratinized tissue to resist restorative procedures and minimize the probability of chronic inflammation that can result when a restorative margin resides on mucosa ⁴.
9. Once the flaps are adapted, potassium oxalate should be used to help decrease postsurgical sensitivity. The liquid is applied to the root surface for 45–60 s and then lightly air-dried. Repeat 2–3 times.
10. Cement provisional prosthesis with a polycarboxylate cement such as Tylok (Dentsply International: York, Pennsylvania, USA) or Durelon.
11. Home care instructions include rinsing with chlorhexidine twice daily (morning and evening) and brushing with Prevident toothpaste (Colgate-Palmolive, New York, New York, USA) at bedtime. After meals the patient rinses with water or Listerine (Johnson and Johnson, New Brunswick, New Jersey, USA) to remove food particles.
12. At 4 weeks, the provisionals are either remade or relined leaving 1 mm of space between the provisional margin and tissue for continued biologic width growth in a coronal direction. No margination of the tooth surface is undertaken at this time.
13. At 14 weeks, chamfer margins are placed just coronal to the gingival collar and impressions taken. When a dark substructure is present in the anterior, margin placement may be necessary in the sulcus to avoid cosmetic issues. The new crown contours must follow the prepared tooth surface in the final impression. It is imperative that the lab fully understand furcation removal and the need for the new restoration(s) to follow such contours.
14. The patient is instructed on measures to facilitate hygiene and maintenance procedures initiated.

This protocol is applicable to any tooth slated for treatment. The cases below will provide examples of biologic shaping of teeth.

Case 1. Figure 4. (a) Preoperative image of the maxillary left quadrant. Due to occlusal issues and temporomandibular disease, the treatment plan included provisionalization of all maxillary teeth to correct occlusal concerns. (b) Provisionals and residual cement removed. (c) Incisions were made using a #15 scalpel blade and full thickness flap elevated to avoid flap perforation due to an underlying exostosis. Once the flap was reflected beyond the exostosis, a split-thickness flap was initiated to allow suturing of the flap to the periosteum upon closure. An internal bevel incision was used to elevate the lingual flap. It is critical that the buccal and lingual flap incisions preserve as much of the papillary tissue as possible to allow for primary closure of the flaps. All granulation tissue or remaining tissue from reflection of the flap was removed with a #4 Goldman-Fox curette. Note the presence of a mesial concavity and residual calculus on the first premolar (arrow). (d) A coarse diamond bur (c847–016, Axis Dental Co., Coppell, TX, USA) is used to remove all irregularities on the root surface including CEJs, concavities, developmental grooves, and the lip of furcations. (e) This is followed by preparation using a superfine bur (f847–016, Axis Dental Co., Coppell, TX, USA) to smooth the root surfaces to a polished finish. (f, g) To complete the procedure, a diamond round bur #4 is used to contour the bone to create a parabolic architecture.



Fig. 4. Biologic shaping of multiple teeth in quadrant eliminates mesial concavity of first premolar and creates a biocompatible environment and fabrication of full-coverage restorations that do not violate biologic width. Occlusion was a factor and therefore all teeth are needed to be restored. Final restorations by Dr. Howard Chasolen. The case is over 5 years old. See text for details.

If there are any areas where biologic width space is still needed, minor ostectomy is performed to create such a space. Complete furcation removal is confirmed when a periodontal probe is placed at the level of the bone in the furcation and moves freely without catching any undercuts coronal to the furcation. (h, i). A Castro-Viejo is used to suture 5–0 chromic gut material through the flap into the periosteum starting from the distal aspect of the second molar from buccal to lingual. A knot can be used to begin the continuous suture technique.

Because the suture passes through the periosteum when the suture is pulled to tie the knot, the flap lays just coronal to the bone creating primary coverage. The suture is continually passed from buccal to lingual interproximally from the distal to the mesial of the canine, and the suture is tied. The entire flap should lay tight against the bone and just coronal to the bone to create primary closure. There is no need for any pak as the flap will not move. See Supplementary Figures for suturing technique. (j, k) E-Max restorations with fullcoverage gold on the second molar. This case is over 5 years old. Final restorations by Dr. Howard Chasolen.

Case 2. Figure 5. (a, b) Upon removal of provisional restorations, a mesial concavity and calculus can be observed on the first premolar. For the patient and hygienist, this creates a non-cleanable environment that is at risk for continued periodontal breakdown. (c, d) Removal of the provisional restoration provides unimpeded vertical and visual access for the periodontist. Elimination of the concavity facilitates plaque removal for the patient and hygienist. Because the concavity is interproximal, it is critical that it not be accentuated as with buccal or lingual furcations. Rather, removal or blending of the line angles approximating the furcation should take place. The objective is to remove or flatten the concavity so floss and a hygienist's curette will achieve removal of plaque and calculus. (e) Minor ostectomy with a round diamond bur to create a parabolic bony anatomy. (f) Continuous suture provides primary closure (see supplementary figures for suturing technique). (g) At 14 weeks, a new restoration can be fabricated resulting in a biocompatible environment. Thereafter, the patient is placed on alternating 3-month recall with the restorative dentist.



Fig. 5. Mesial concavity and calculus present on the first premolar. Biologic shaping eliminates the concavity and facilitates hygiene measures. Restorations by Dr. William Strupp Jr.

Case 3. Figure 6. (a, b) The provisionals and any remaining cement were removed. Note the minimal tooth structure remaining on the first molar and location of cord in the furcation area (white arrows). (c) Incisions were made using a #15 scalpel blade and split-thickness flap elevated past the mucogingival junction. On the lingual an internal bevel incision was used to elevate the lingual flap. As stated above, it is critical for both the buccal and lingual flap incisions that as much of the papillas be kept to allow for primary closure to occur when the flaps are sutured after all necessary surgical procedures. Note the presence of existing margin in furcation space (black arrow). Restoration of this tooth would require placement of a new margin in the furcation area. (d) Biologic shaping procedures performed as per Case 1. (e, f) Final preps with thin chamfer margins finished at the tissue level 4 months postsurgery. Tissue retraction with only one cord: #7 Sil Trax Epi (Pascal International Inc., Bellevue, WA, USA) soaked in Hemodent (Premier Dental, Plymouth Meeting, PA, USA)

immediately rinsed after gentle placement so as not to damage connective tissue fibers in the biologic width. (g–i) Restorations cemented in place. (j, k) Clinical images taken at a 10-year follow-up. (l, m) Radiographs demonstrating conservative nature of biologic shaping. Over a 10-year period, it is noted that endodontic therapy was not needed on any tooth. Unless endodontic treatment is needed prior to biologic shaping, very rarely was endodontics needed after treatment. (l) First radiograph October 2005. (m) Second radiograph January 2018. Patient is now 84 years old. Restorative work by Dr. Howard Chaso.



Fig. 6. Example of multiple teeth requiring crown lengthening and long-term follow-up of the case using biologic shaping. Conventional crown lengthening surgery will further open the furcation area creating a non-cleanable area for patient and hygienist. Porcelain fused to metal restorations fabricated by Dr. Howard Chasolen.

Biologic Shaping of Molars

As stated above, furcation lesions present unique challenges for both the periodontist and restorative dentist. When treating molars with periodontal-restorative needs, alternative approaches to conventional crown lengthening procedures should be considered when furcation involvement is present due to the potential for biologic width/supracrestal fiber invasion and further opening of the furcation. This is due to the fact that the bone in the furcation usually moves coronally as one tries to crown lengthen in the furcation area. This makes it virtually impossible to create a space for the biologic width without destroying the furcation bone and considerably compromising the tooth. Therefore, rather than removing the bone, begin by removing the restorative margin or CEJ, and shape the tooth structures surrounding the furcation (Fig. 7).

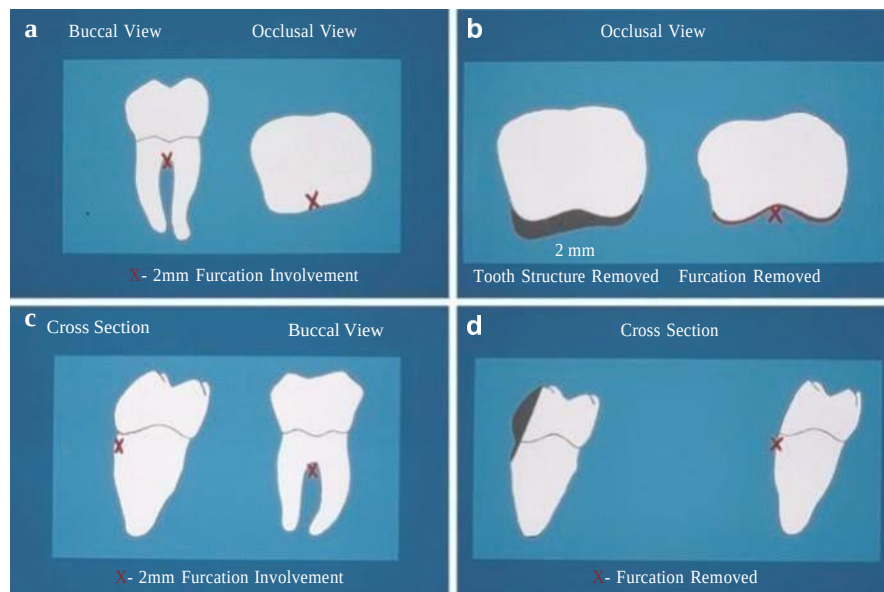


Fig. 7. (a) When looking at the images, the letter x is used to indicate the location of the furcation from the buccal and occlusal view. (b) The shaded areas indicate exactly where tooth structure should be removed. It is always important to remove tooth structure adjacent to the furcation to avoid creating a deep groove that cannot be cleaned. The x on the second photograph indicates that the furcation is no longer present as is located outside of the tooth structure. (c) Images indicate the location of the furcation from a crosssectional view. (d) The shaded area indicates where the necessary tooth structure needs to be removed so that the furcation will be in fact eliminated. One should notice that no height of contour is now present and should be kept that way in the final restoration. Again, notice in the photograph on the right the x location is now on the outside of the tooth surface and is thus eliminated. The barreledin furcation must be continued to the occlusal surface to avoid creating a not cleanable area.

Once this is accomplished, it will be easier to determine if ostectomy is required. Importantly, this approach is applicable to teeth with either shallow or deep furcations and is particularly advantageous in teeth that require full-coverage restoration. When properly performed, the furcation defect will be eliminated. As stated above, this is confirmed when a periodontal probe is placed at the level of the bone in the furcation and moves freely without catching any undercuts coronally for the furcation (Fig. 2). Once restored, hygiene measures will be facilitated for the patient and hygienist. The following cases are presented below to illustrate the benefits of biologic shaping of molars.

Case 4. Figure 8. (a) Example case of multiple teeth requiring crown lengthening. Existing restorative margins approximating the crest of the bone on the premolars and furcation entrance on the first molar (black arrows). There are concerns with trying to perform crown lengthening in the furcation to create a space for the biologic width. As one tries to remove the bone in the furcation, the bone actually moves coronally as the surgeon tries to crown lengthen making it virtually impossible to create a space for the biologic width. By simply removing the old margin, there is no mechanical location from which the bone has to be removed, thus creating a space for the biologic width. (b) Example of this phenomenon after the lip of the margin is removed in the furcation area. The bone of the furcation is located coronally to adjacent bone (white arrow). (c) Biologic shaping of both teeth creates necessary space for the biologic width and facilitates fabrication of restorations that are cleansable for both patient and hygienist. The material is porcelain fused to gold and the margins are supragingival. Restorative work by Dr. Ira Berge.



Fig. 8. Biologic shaping of premolars and molars in quadrant. Biologic shaping of molar and fabrication of full-coverage restoration mimicking the new tooth contours removes the furcation lesion and facilitates long-term

maintenance of periodontal health. Restorations by Dr. Ira Berger.

Case 5. Figure 9. (a) Upon flap reflection, the margin on the mesial aspect of the first molar can be noted approximating the bone (white arrow) indicating that crown lengthening is required to establish the biologic width. Conventional crown lengthening surgery guided by the existing restorative margin will result in excessive removal of interproximal bone as well as the bone along the buccal and lingual roots to create a parabolic architecture necessary to avoid future periodontal breakdown. (b) Biologic shaping removes the existing margin negating the need to aggressively recontour the bone. Once accomplished, minor osseous contouring when required creates space for the biologic width and creates a parabolic architecture for bone and soft tissue continuity (black arrow). (c) Careful incision design and continuous suturing technique provide complete flap closure. Note supragingival location of core buildup/tooth interface. Core and provisional placed by Dr. William Strupp Jr.



Fig. 9. Minor osseous recontouring combined with biologic shaping creates a cleansable environment and restorative margins that do not impinge upon the biologic width or furcation. See text for details. Core and provisional placed by Dr. William Strupp Jr. See text for details

Case 6. Figure 10. (a) Old crowns with severe microleakage resulting in caries. Endodontics was required due to pulpal necrosis on the first molar. (b) Caries removed, as much as possible term.



Fig. 10. Comprehensive team approach demonstrates how hopeless teeth can be treated and retained long

Non-antimicrobial coronal endodontic seal placed by the endodontist. (c) Minimal tooth structure left with significant demineralized chalky dentin left after removing as much caries as possible without pulp exposure. (d, e) Core buildups with feather edge preps carrying margins to sound tooth structure. (f) Due to a thick buccal plate, a full thickness flap was elevated

to avoid perforation of the flap. Once the flap was elevated past the mucogingival junction, a split-thickness flap was initiated. (g) Biologic shaping has been performed, and at this point, there is absolutely no margins remaining on any teeth. All concavities, furcations, or surface irregularities have been removed. Osseous contouring has taken place to create a parabolic architecture. It can be noted that the periosteum is still intact on the bone which will be used to suture the flap. (h) Continuous suturing to the periosteum allowing flap positioning just coronal to the bone. (i) Occlusal view showing primary closure of the flap. The occlusal view also demonstrates how biologic shaping has created smooth root surfaces to the flap position. From previous photos the smoothness ends at the level of the bone. It can also be noted that the furcations have been removed to the occlusal surfaces. (j, k) Final preps with thin chamfer margins finished at the tissue level 4 months postsurgery. Tissue retraction with only one cord as described in.

Case 7. Restorations fabricated using Feldspathic porcelain with gold on the second molar. (l, m) Ten-year followup clinical image and radiographs. It should be noted that all endodontics was completed prior to periodontal treatment because of pulpal involvement and lack of tooth structure above the tissue. After 10 years no further endodontics was undertaken. Restorations by Dr. William Strupp Jr.

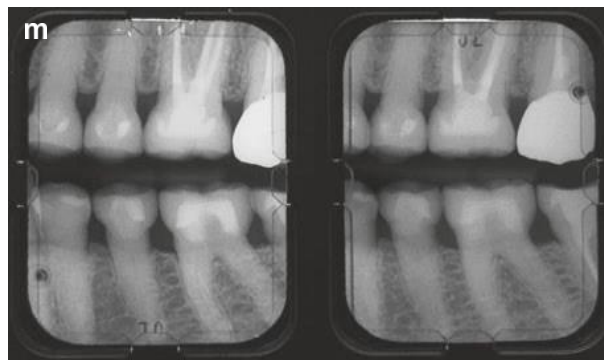


Fig. 10. Intraoral Radiographi Considerations When Performing Biologic Shaping

It is imperative that the patient understand and accept the need for full-coverage restoration of teeth due to the modification of existing tooth structure to facilitate hygiene. Further, when treating a concavity on any tooth interproximally, it is important not to accentuate the concavity but to blend the line angles so that the concavity is removed. Blend the line angles adjacent to the furcation to remove the concavity and as best as possible create a convexity to allow for maintenance (Fig. 11).

By removing the line angles, the patient will be able to use dental floss, and the hygienist's curette will be effective in removing plaque and calculus. If root sensitivity is present after biologic shaping, it should be managed by topical application of agents to seal dentinal tubules. It should also be realized that biologic shaping is not indicated for Class III furcation involvement. Finally, molars with Class I and II furcations are at minimal risk of pulpal exposure when biologic shaping is properly performed.

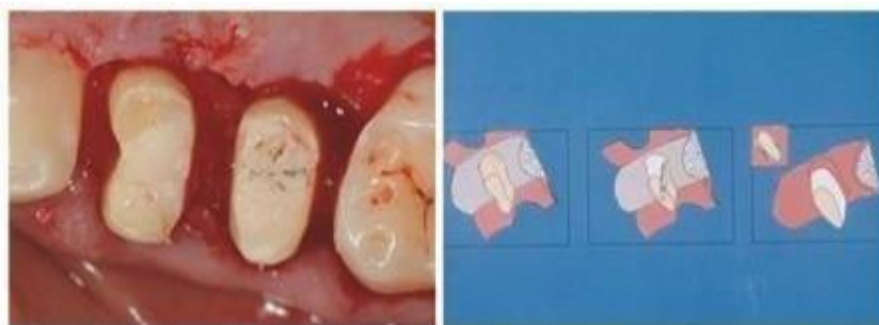


Fig. 11. Example of incorrect biologic shaping of a mesial concavity on a premolar. (a) Instead of removing the line angles to blend away the concavity, the concavity was accentuated. The situation results in a virtually impossible area for floss or a hygienist's curette to effectively remove plaque or calculus. (b) To prevent accentuating the concavity interproximally, do not barrel into the concavity or furcation. Rather, blend the line angles, and as best as possible create a convexity to allow for maintenance.

Conclusion

Biologic shaping conserves the bone while establishing biologic width necessary for restoration of teeth. It facilitates hygiene measures by both patient and dentist/ hygienist and creates a biocompatible environment required for long-term success. However, incorporating biologic shaping into practice requires a team approach with a thorough understanding of the rationale, anatomy, surgical and restorative procedures, materials, and final restorative contours to be achieved. When properly done, biologic shaping can improve the short and long-term prognosis of teeth.

REFERENCES

1. Melker DJ, Richardson CR (2001) Root reshaping: an integral component of periodontal surgery. *Int J Periodontics Restorative Dent* 21:296–304
2. Strupp WC Jr, Melker DJ (2003) Maximizing aesthetics using a combined periodontal restorative protocol. *Dent Today* 22:60–62, 64–9.
3. Melker DJ (2009) Biologic shaping. *J Impl Adv Clin Dent* 1:13–17
4. Stetler KJ, Bissada NF (1987) Significance of the width of keratinized gingiva on the periodontal status of teeth with submarginal restorations. *J Periodontol* 58:696–700
5. Tucker LM, Melker DJ, Chasolen HM (2012) Combining perio-restorative protocols to maximize function. *Gen Dent* 60:280–287

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2. Զիկագոյի Իլինոյսի համալսարանի պարոդոնտոլոգիայի ամբիոն, Ստոմատոլոգիայի քոլեջ, Զիկագո, ԱՄՆ

Ամփոփում

Պարոդոնտալ վիրաբուժությունը ներառում է ոսկրային և/կամ փափուկ հյուսվածքների ձևափոխում՝ թերապևտիկ նպատակին հասնելու համար: Այս նպատակները ներառում են պարոդոնտալ արատների բուժումը, ներառյալ մոյարների ֆուրկացիոն վնասվածքները և պսակի երկարացման պրոցեդուրաները՝ հեշտացնելու ատամի կամ ատամների վերականգնումը: Ավանդաբար, ռեզեկտիվ և վերականգնողական մեթոդները կենտրոնացած են ոսկրային հյուսվածքների վրա՝ քիչ ուշադրություն դարձնելով ատամի մակերեսի փոփոխությանը: Ցավոք սրտի, դա կարող է հանգեցնել ոսկորների չափից դուրս հեռացման և/կամ չմաքրվող և կենսաբանորեն անհամատեղելի միջավայրի ստեղծմանը: Բացի այդ, վերականգնողական տեխնիկան կարող է հանգեցնել անկանխատեսելի արդյունքների ֆուրկացիոն ախտահարումների տարածքում: Կենսաբանական ձևավորումը նախատեսված է մաքրվող, կենսահամատեղելի արմատային մակերես ստեղծելու համար, որը կարող են գործածել և՛ հիվանդները, և՛ ստոմատոլոգները/հիգիենիստները:

Կենսաբանական ձևավորումը համատեղում է պարոդոնտալ և վերականգնող ստոմատոլոգիան և նպատակ ունի հիվանդների համար հեշտացնել պարզ հիգիենիկ միջոցները, ինչպիսիք են թելն ու ատամի խոզանակը, ինչպես նաև հեշտացնել հիգիենիստների մասնագիտական խնամքը՝ ատամնափառը և ատամնաքարը հեռացնելու համար: Այն նաև ստեղծում է կենսահամատեղելի չափեր, որոնք անհրաժեշտ են ատամի վերականգնման համար՝ առանց խախտելու կենսաբանական լայնությունը: Այս հոդվածը կենտրոնանում է պարոդոնտի բուժման ընթացքում կենսաբանական ձևավորման վրա: Սա հատկապես կարևոր է, եթե էմալի գոգավորությունը կամ անհարթությունները առկա է պսակի եզրին մոտ: Սա կարող է ստեղծել անկառավարելի իրավիճակ և մեծացնել ոսկրային հենքի հետագա կորստի ռիսկը: Բանն այն է, որ կենսաբանական ձևավորումը սահմանափակում է ոսկրերի անհարկի հեռացումը և ստեղծում կենսահամատեղելի միջավայր: Կենսաբանական ձևավորումը պահպանում է ոսկրը՝ ստեղծելով ատամների վերականգնման համար անհրաժեշտ կենսաբանական լայնությունը: Այնուամենայնիվ, կենսաբանական մոդելավորումը գործնականում կիրառելը պահանջում է թիմային մոտեցում՝ հիմունքների, անատոմիայի, վիրաբուժական և վերականգնողական պրոցեդուրաների, նյութերի և վերջնական վերականգնողական ուրվագծերի խորը ըմբռնմամբ: Ճիշտ կատարման դեպքում այն կարող է բարելավել ատամների առողջության երկարաժամկետ կանխատեսումը:

БИОЛОГИЧЕСКОЕ ФОРМИРОВАНИЕ В ПЕРИОДОНТАЛЬНОЙ ТЕРАПИИ

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Резюме

Пародонтальная хирургия включает модификацию твердых и/или мягких тканей для достижения терапевтической цели. Эти цели включают лечение пародонтальных дефектов, в том числе фуркационных поражений моляров, и процедуры удлинения коронки для облегчения восстановления зуба или зубов.

Традиционно резективные и регенеративные методики сосредотачиваются на костных структурах, уделяя мало внимания модификации поверхности зуба. К сожалению, это может привести к чрезмерному удалению кости и/или созданию среды, которая не поддается очистке и биологически несовместима.

Кроме того, регенеративные методы могут привести к непредсказуемым результатам в области фуркационных повреждений, тем самым предрасполагая моляры к дальнейшей потере прикрепления.

Биологическое формирование предназначено для создания очищаемой, биологически совместимой поверхности корня, с которой могут справиться как пациенты, так и стоматологи/гигиенисты.

Биологическое формирование сочетает пародонтологический и восстановительный этапы стоматологии и направлен на то, чтобы облегчить пациентам уход на дому с использованием простых средств гигиены, таких как зубная нить и зубная щетка, а также облегчить профессиональное обслуживание гигиенистами для удаления зубного налета и зубного камня. Он также создает биологически совместимые размеры, необходимые для восстановления зуба без нарушения биологической ширины. Кроме того, биологическое формирование устраняет факторы риска, связанные с зубами, такие как борозды развития, выступы эмали и вогнутости.

Здесь основное внимание уделяется модификации поверхности зуба с удалением кости только в случае крайней необходимости для создания биосовместимой среды. В этой статье основное внимание уделено биологическому формированию в ходе пародонтологического лечения.

Это особенно важно, если формирующаяся борозда, вогнутость или выступ эмали находятся в непосредственной близости от существующего края коронки, что приводит к образованию пустот или задержке цемента в борозде.

Это может создать неуправляемую ситуацию и увеличить риск дальнейшей потери привязанности.

Таким образом, идеальная терапия будет включать модификацию структуры зуба для устранения этих анатомических несоответствий и создания нового реставрационного края, наддесневого по отношению к предыдущему краю.

Дело в том, что биологическое формирование ограничивает ненужное удаление кости и создает биосовместимую среду.

Биологическое формирование сохраняет кость, создавая биологическую ширину, необходимую для восстановления зубов. Тем не менее, внедрение биологического моделирования в практику требует командного подхода с глубоким пониманием основ, анатомии, хирургических и восстановительных процедур, материалов и окончательных реставрационных контуров.

При правильном выполнении биологическая форма может улучшить краткосрочный и долгосрочный прогноз состояния зубов.