Basic Flap Management

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Periodontics is dedicated to saving a patient's teeth for his or her lifetime. Because the primary cause of periodontal disease is dental plaque, the main thrust in therapy is the creation of an environment the patient can keep clean. To this end rough restorations are smoothed or replaced, calculus is removed, and pocket depth reduction is attempted by curettage and root planing. If bony craters exist a variety of surgical procedures may be necessary. The correction of these osseous defects almost always requires that a flap be raised. It is the management of such flaps that is discussed in this article.

**To Split or Not to Split—That is the Question!**

A full thickness (mucoperiosteal) flap is one in which the entire soft tissue complex is elevated exposing the underlying alveolar bone (Fig. IA). A partial thickness (split thickness) flap is one in which only the superficial epithelialized portion of the soft tissue is reflected leaving the periosteum and connective tissue fibers attached to the bone (Fig. IB).

For more than 15 years the relative merits of the two flaps have been discussed, often heatedly. **Proponents of the partial thickness flap argue that the retention of the periosteum is much safer. They are particularly concerned about irreversible radicular bone loss (the interproximal region seems to be able to regenerate any bone lost by resorption during osseous surgery) especially if the tooth is prominent and/or the bone covering the root is thin or absent (dehiscence or fenestration) as seen in Figure 2. They worry that a full thickness flap may not reattach to a denuded root surface once the dehiscence has been exposed to the oral environment. A positive aspect of the partial thickness flap is said to be extremely accurate flap placement by the use of periosteal sutures—certainly an impossibility if a mucoperiosteal flap is reflected.**

Those favoring the full thickness flap state that it can be done

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more quickly (the partial thickness flap causes less bleeding, and gives the long run the kinder to the technique is performed with bone loss is slight and the might not reattach to an area notified because of the relative states that in the presence of tissue automatically is removed elimination of the craters. Flap ered to be problems and it is the full thickness flap heals mo In an attempt to shed soning evidence for each argumenference of opinion was gene ducted on dogs by Wilderman general consensus was that kinder to the underlying bonflaps. However, this hardly wa excised and discarded the reflect and polished (using a rubber sure removal of all tissue toained his elevated partial thickn position. In an attempt to experiment Wilderman\textsuperscript{6} cond the periosteum was retained be before, resorption of the bon pletely restored after 180 days with the partial than with the Coxich\textsuperscript{7} and Ramfjord\textsuperscript{8} r The authors did admit that su the final reparative properties the basis of their histologic m retention was only slightly le denudation.

But what about the prot discarding it? The results of an ample Bhaskar et al.\textsuperscript{3} using m of a full thickness flap into a partial thickness flap. On the in the monkey the partial heal A group headed by Pet humans, performed operations than would be desirable in cats and then sutured the tips into bone. Measurements made a
more quickly (the partial thickness flap requires sharp dissection), causes less bleeding, and gives increased visibility; the time saved will in the long run be kinder to the tissues. They maintain that if the surgical technique is performed with skill and care the chance of irreversible bone loss is slight and the fear that the elevated full thickness flap might not reattach to an area of dehiscence or fenestration is not justified because of the relative rarity of this event. This group further states that in the presence of interproximal bony defects the connective tissue automatically is removed from the crest of the ridge during the elimination of the craters. Flap placement and suturing are not considered to be problems and it is claimed that, for the first couple of weeks, the full thickness flap heals more rapidly than the partial thickness flap.

In an attempt to shed some light on the controversy, the supporting evidence for each argument will be considered. Part of the difference of opinion was generated by the “sister” experiments conducted on dogs by Wildermand and Staffileno12 in the late 1950’s. The general consensus was that Staffileno’s partial thickness flaps were kinder to the underlying bone than were Wilderman’s full thickness flaps. However, this hardly was a fair comparison because Wilderman excised and discarded the reflected full thickness flap and then scraped and polished (using a rubber wheel) the teeth and alveolar bone to ensure removal of all tissue tags. Staffileno, on the other hand, maintained his elevated partial thickness flap and then sutured it at its original position. In an attempt to compare the results of his denudation experiment Wilderman13 conducted a similarly designed study in which the periodontium was retained but the partial thickness flap discarded. As before, resorption of the bone over root prominences was not completely restored after 180 days but less bone (1.3 vs. 2.5 mm) was lost with the partial than with the full thickness flaps.

Costich14 and Ramfjord15 repeated Wilderman’s studies in humans. The authors did admit that sufficient time had not elapsed to evaluate the final reparative properties of the alveolar bone but stated that on the basis of their histologic material, the reaction following periodontal retention was only slightly less severe than the one reported after denudation.

But what about the protective properties of the flap itself? Why discard it? The results of animal experiments are conflicting. For example Bhaskar et al.16 using miniature swine observed that the reflection of a full thickness flap biologically was as sound as the elevation of a partial thickness flap. On the other hand Caflisse et al.17 claimed that in the monkey the partial heals faster than the full thickness flap.

A group headed by Pennell18 reflected full thickness flaps in humans, performed osseous reduction (which often was more radical than would be desirable or even necessary in therapeutic procedures), and then sutured the flaps into place 1 to 2 mm coronal to the alveolar bone. Measurements made up to 30 days later revealed that an
average reduction of .54 mm occurred in the height of the alveolar crest—an amount considered to be clinically insignificant by the authors.

Finally Wood et al. reflected a full thickness flap in the lower anterior region from the cuspid to the midline and a partial thickness flap from the midline to the other cuspid in nine patients. Healing on the partial thickness flap side appeared to be slower but by one month was indistinguishable clinically from the full thickness side. Seven patients agreed to have the area relapped (a full thickness flap was used) four to six months postoperatively. Measurements demonstrated a mean loss in bone height of .62 mm on the full thickness flap side and .98 mm on the partial thickness side. The authors concluded that partial thickness flaps were not indicated in the areas with thin connective tissue.

Who then is right? Perhaps both sides! It probably is fair to say that under most circumstances it is perfectly safe to raise a full thickness flap in order to expose defects in the underlying bone. However, it might be prudent to reflect a partial thickness flap in cases of a suspected dehiscence or fenestration. The clinician therefore should be wary of teeth already demonstrating recession and an inadequate zone of gingival tissue, rotated maxillary molars where one of the buccal roots is thrown into prominence, and teeth in buccoversion. The absence of radicular bone can be verified by “sounding” under local anesthesia, i.e., by piercing the alveolar mucosa with an explorer and feeling for the coronal edge of the bone. A possible dilemma occurs in areas of a thin soft tissue covering (clinically the gingiva and alveolar mucosa may display a yellowish cast instead of the expected pinkish color). If the gingiva is “split” and insufficient connective tissue is present to maintain the integrity of the epithelium, the flap may slough leaving an inadequate layer of connective tissue to protect the underlying bone. Perhaps it would be better to reflect a full thickness flap with the hope that upon suturing reattachment will occur optimally. It should be added that even in the elevation of a full thickness flap by blunt dissection, only that bone covered by the gingiva actually is denuded; the periosteum under the mucosal portion of the flap usually is retained creating sort of a “partial full thickness flap.” On the palate most periodontists reflect a partial thickness flap but then remove the connective tissue and periosteum that remains between the epithelialized flap and the palatal bone so the flap really ends up as a thinned out full thickness flap.

**THE DONT’S OF FLAP REFLECTION**

**Gingiva is Precious—Don’t Throw It Away!**

Gingiva, not alveolar mucosa, must form the soft tissue collar around the neck of a tooth. The former is tough and can withstand the daily insults of toothbrushing or a cate and ill-designed to provide bevel incision therefore should be lium but retain most of the gingivagingiva, say 6 or 7 mm, does exi remove a couple of millimeters incision. A full thickness flap then a veolar mucosa which, being elastic Palatal Scallops—“The Long and On the palate the clinician oby out of keratinized tissue. Here the excess marginal mucosa so that at the end of the surgical procedure palatal scallop is used. Perhaps the steps. The level of the underlying sounding. Under anesthesia a peric tal sulcus parallel to the long-axis of the reading in millimeters is noted ture point is made at the same lev pendicular to the long-axis of the from the distopalatal corner of the back down to the mesopalatal corner collar is removed. A second incision, made in the cut margin (Fig. 5) thus papillae are thinned and released, tained and reflected and the interposing the underlying bony defects.

If designed correctly the pala around the palatal roots just cover
occurred in the height of the alveolar bone to be clinically insignificant by the added 0.5 mm thickness flap in the lower anterior midline and a partial thickness cupid in nine patients. Healing appeared to be slower but by one month from the full thickness side. Seven pa-ch apped (a full thickness flap was used) the authors concluded that partial thick- ness flaps both sides! It probably is fair to say that it is perfectly safe to raise a full thickness flap in the underlying bone. How- ever, a partial thickness flap is recommended in cases of recession. The clinician therefore should be cautious about raising an inadequate zone in areas where one of the buccal teeth is present. The abdomen by “sounding” under local analgesic mu cosa with an explorer and feeling the flap. A possible dilemma occurs in areas of the gingiva and alveolar mucosa instead of the expected pinkish color). If a clotting time is present to maintain the flap may slough leaving an inade- quate zone to protect the underlying bone. A thickness flap with the hope of aamous uneventfully. It should be cut of a full thickness flap by making sure the gingiva is denuded; the top portion of the flap usually is retained as a thickness flap.” On the palate a most thickness flap but then remove the con- that remain between the epithelialized flap really ends up as a thinned out full

**OF FLAP REFLECTION**

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cossa, must form the soft tissue collar torner is tough and can withstand the daily insults of tooth brushing or eating crusty bread; the latter is deli- cate and ill-designed to provide this protection. A marginal internal bevel incision therefore should be made to remove the sulcular epithelium but retain most of the gingival complex (Fig. 3). If a wide band of gingiva, say 6 or 7 mm, does exist, it certainly is not detrimental to remove a couple of millimeters while making the initial releasing in- cision. A full thickness flap then is reflected apically to include the alveolar mucosa which, being elastic, allows the flap to be moved freely.

**Palatal Scallops — “The Long and the Short of It”**

On the palate the clinician obviously need not worry about running out of keratinized tissue. Here the problem is one of getting rid of excess marginal mucosa so that negligible sulcus depth will be present at the end of the surgical procedure. An internal bevel incision with a palatal scallop is used. Perhaps the beginner should attempt this in two steps. The level of the underlying alveolar crest is determined by sounding. Under anesthesia a periodontal probe is thrust into the palatal sulcus parallel to the long-axis of the tooth until bone is contacted, the reading in millimeters is noted, and an external horizontal puncture point is made at the same level. With the scalpel blade held perpen- dicular to the long-axis of the tooth, an incision to bone is made from the distopalatal corner of the tooth, up to the bleeding point, and back down to the mesopalatal corner of the same tooth (Fig. 4) and the collar is removed. A second incision, this time with an internal bevel, is made in the cut margin (Fig. 5) thus thinning the thick ledge. After the papillae are thinned and released, the epithelialized surface layer is re- tained and reflected and the internal connective tissue is removed ex- posing the underlying bone defects.

If designed correctly the palatal scallops should fit accurately around the palatal tissues just covering the crest of the bone. If the
scallops were too conservative the flap will be too long and create residual soft tissue depth. If too severe the flap will be short and the bone exposed (Fig. 6A). Surface resorption, necrosis, and sequestration may take place (Fig. 6B). Healing, while prolonged, usually produces an acceptable result because the palatal bone, being thick, contains the cancellous core needed in repair.

In an attempt to save time, some clinicians prefer to "straight-line" the palatal flap (Fig. 7A). Although healing may be somewhat delayed because the interproximal regions lack a soft tissue covering, this is not considered to be of clinical consequence and final contours can be excellent with minimal, if any, residual sulcus depth (Figs. 7B and C).

Figure 5. Internal bevel incision on thick edge of palatal scallop. The surface epithelialized portion is reflected as the palatal flap and the connective tissue between the Orban knife and the teeth and bone is removed.
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Figure 6. A. Palatal scallop over molar too severe resulting in bone denudation.
B. Six weeks postoperatively healing is still not completed. The area gradually is sloughing necrotic bone.

Figure 7. A. "Straight-line" incision on palate. B. Area shown in Figure 7A after one week of healing. Note granula-
tion tissue has covered bone. C. View of Figure 7A taken three months postopera-
tively, demonstrating acceptable contours and minimal sulcus depth.
“Lumpy Gums”

A mistake often made in the reflection of flaps is inadequate internal thinning of the papillae and margins (Fig. 8). The resultant thick or bulbous soft tissue often must be reshaped extensively (i.e., gingivoplasties) to achieve the desired “physiologic” contours.

Don’t “Mouse Hole” It

One of the most common errors made in flap design is the hesitancy to extend the primary incisions far enough to the mesial or distal so that good access to the underlying bone may be gained. Students are notorious for trying to correct bony defects while peering through a little tiny hole. It is much better to continue a neat incision a centimeter or so past the actual surgical site thus creating a flap that can be retracted gently while bone is recontoured (Fig. 9), than to tug and pull on an inadequately reflected flap (Fig. 10A). Not only is it difficult to see what is going on but healing is delayed because of the trauma inflicted on the flap (Fig. 10B). A second benefit of extending the incision another

Figure 8. A. Internal thinning of papilla. If not done adequately residual pocket depth or bulbous contours as seen in Figure 8 may result. B. Palatal flap is released by thinning papillae as seen here and margins as seen in Figure 5.

Figure 10. A. Envelope flap. B. Surgical site seen in A, showing very smooth. From Johnson, R. 9'1, June 1972, with permission.)
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Figure 9. Flap displaying good relaxation. Compare with Figure 10.

Figure 10. A. Envelope flap under tension because incision was not extended far
enough. B. Surgical site seen in 4 one week postoperatively. The traumatized flap is heal-
ing very slowly. (From Johnson, R. H.: Complications and emergencies. Ont. Denti.
57:1, June. 1974, with permission.)
tooth is that it allows the clinician to drape the relaxed flap while apically positioning it at time of closure (see later).

Vertical releasing incisions also have been advocated as a means of gaining adequate relaxation. The author prefers a properly designed envelope flap because vertical incisions often do not close well and healing appears to be retarded (Figs. 11 and 12). Bleeding can be a problem in the posterior part of the palate or on the lingual of the lower second and third molars. Certain circumstances do call for a vertical incision. If unemptied teeth just mesial to the surgical site display a barely adequate zone of gingiva or the hint of a dehiscence, complications could arise if a full thickness envelope flap were raised in the area. It obviously is preferable to drop a vertical incision rather than encroach upon a questionable area. If done, the vertical incision should be placed along the line angle of the tooth to the mesial and not over the root prominence thus avoiding the possibility of a gingival cleft on healing.

Figure 11. A, Vertical releasing incision provides adequate relaxation. B, Area seen in A, one week postoperatively. Note delayed healing along line of vertical incision.

Figure 12. Extreme example of verticals were dropped.

Emptying the Tuberosity

The tuberosity should be the distal of the terminal molar of the buccal and palatal flaps. Tuberosity itself. Figure 13 demonstrates this. The distance between the thickness of the tissue. The farther the distance needed to be wide, healing will be slower and granulate in and reepithelialize.

Figure 13. Above, Occlusal view of line of incisions made in posterior tuberosity to the distal of terminal tooth. Below: Occlusal view showing how the tuberosity was undermined and emptied. (From: J. Hard tissue surgery, Ont. Dentist, 57, with permission.)
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Figure 12. Extreme example of delayed healing (one week postoperatively) where
vertical incisions were dropped.

Emptying the Tuberosity

The tuberosity should be opened to reveal any bony problems on
the distal of the terminal molar, to relieve tension in the posterior part
of the buccal and palatal flaps, and to reduce soft tissue depth on the
tuberosity itself. Figure 13 demonstrates one approach to accomplish
this. The distance between the two parallel incisions depends on the
thickness of the tissue. Verified by sounding, the deeper the tissue the
greater the distance needed to prevent flap overlap on closure. If too
wide, healing will be slower but the exposed ridge eventually will
granulate in and reepithelialize.

Figure 13. Above, Occlusal view showing out-
line of incisions made in maxillary tuberosity. Below,
Distal of terminal tooth illustrating how tuberosity is
undermined and emptied. (From Johnson, R. H.;
Hard tissue surgery. Ont. Dentist., 57:1, April, 1974,
with permission.)

provides adequate relaxation. B. Area seen
healing along line of vertical incision.
"The Spongy Triangle"

In the mandible, the retromolar pad may not be as easy to empty. The tissue often is "jelly-like" and difficult to incise. Injection into the area may increase rigidity and facilitate surgery but the clinician often is frustrated to discover that this tissue has a tendency to rebound and pile up on the distal of the last molar.

In both the tuberosity and the retromolar triangle, incisions should be kept in keratinized mucosa if possible. This may mean moving the parallel incisions off the center of the ridge toward the palate or to either the buccal or lingual in the lower arch.

The “Whoops” Procedure

Every attempt should be made not to perforate the base of a flap (Fig. 14A). Its blood supply compromised, a portion of the flap may be lost (Fig. 14B). The denuded bone may undergo necrosis and sequestration with prolonged and painful healing. If the involved bone is thick there usually is no irreversible damage. Patient and clinician must “ride out the storm” with the aid of analgesics, delicate irrigation, and

![Image]

Figure 14. A. Accidental perforation of flap has compromised its blood supply. B. One week postoperative. Part of the flap has been lost resulting in denudation of bone. (From Johnson, R. H. Complications and emergencies Dent. Dentist. 11:1. June, 1974, with permission.)

Basic Flap Management

Sometimes repeated periodontal curettage will slough it by removing the dead bone will cover.

If the radicular bone is th cleft) exists and a surgical pro be needed to repair the defect.

DON’T BLOW FAULTY F

The primary purpose for to reach the alveolar bone. A stylet, flap curettage, and root planing attempt to eliminate or at least improve flap placement may nullify these.

"Let the Facial Hang Low!"

On the facial (or lower labial) soft tissue. However, because the mucosal surface of elasticity (alveolar mucosa) the clinician is able to place the margin should be level with the alveolar crest, i.e., pocket. The tooth may seem straightforward, get students to let the suture line seem to want to hike the flap necks of the teeth warm during purpose of recontouring the lab

![Image]

Figure 15. Flap placed and sutures eliminated.
BASIC FLAP MANAGEMENT

sometimes repeated periodontal dressing (noneugenol type). Eventually the sequestrum will slough (it may be possible to hasten the process by removing the dead bone with tweezers) and the underlying exposed vital bone will be covered with granulation tissue and epithelium.

If the radicular bone is thin the possibility of a "runner" (gingival cleft) exists and a surgical procedure such as a free gingival graft may be needed to repair the defect.

DON'T BLOW THE BUNDLE BY FAULTY FLAP PLACEMENT

The primary purpose for elevating flaps is to enable the clinician to reach the alveolar bone. A variety of procedures—osseous resection and fill, flap curettage, and root amputation—have been carried out in an attempt to eliminate or at least reduce pocket depth. When finished, sloppy flap placement may nullify all benefits previously gained.

"Let the Facial Hang Low!"

On the facial (or lower lingual) if the reflected flap is returned to its original position soft tissue pocket depth will not be eliminated. However, because the mucosal portion of the flap adds the dimension of elasticity (alveolar mucosa just seems to shrivel up and disappear) the clinician is able to place the flap at almost any level. As a general rule the margin should be located at or just coronal to the new level of the alveolar crest, i.e., protection without pockets! Although this concept may seem straightforward, a lot of convincing often is necessary to get students to let the sutures for a buccal flap hang loose. They always seem to want to hike the flap too far coronally which may keep the necks of the teeth warm during a July snowstorm but really defeats the purpose of recontouring the bone in the first place (Fig. 15).

Figure 15. Flap placed and sutured too far coronally. Pocket depths will not be eliminated.
About the only time the flaps are pulled coronally is to obtain good closure when regeneration rather than resection of the bony defects is attempted. In this case the craters that were filled with a transplant material must be protected. Usually a second surgical procedure is needed one or two years later to establish physiologic contours and at that time the flaps are positioned apically.

"The Flap About Gaining More Gum!"

Sometimes the facial flap actually is placed apical to the crest of the bone. This is carried out when the original width of gingiva in the surgical site is inadequate, with the hope that the alveolar crest, if devoid of its epithelial covering, will develop a new band of gingival-like tissue. The question of whether denuded bone or periosteal-covered bone will produce a better and wider zone of new gingiva has been debated. Studies in humans, such as the one by Bradley et al., have shown that new soft tissue with characteristics identical to gingiva will form over denuded alveolar bone. Carraro et al. favor the results obtained after the reflection of a partial thickness flap over those of a full thickness flap. Although a team of investigators headed by Pennella concede that healing following the periosteal retention procedure may be faster with less pain and less irreversible radicular bone loss than after denudation, they question whether the type of "gingiva" produced will be of high quality. The craters of their study demonstrated that the new tissue was a cross between gingiva and alveolar mucosa. In the group's opinion the periosteal retention procedure has limited application as a means of creating new gingival tissue.

In summary it would seem that "you are damned if you do and damned if you don't." However, to correct the bony defects and at the same time produce an adequate new band of gingiva, it is recommended that a full thickness flap (high quality gingiva with some risk) be used only if the radicular bone is thick; if thin the partial thickness flap (questionable quality gingiva with low risk) should be tried. It goes without saying that this choice must be made before the fact. There is a way out—the free gingival graft and laterally positioned (pedicle) flap are reliable methods for securing an adequate amount of high quality "gingival" tissue, but they do require a second surgical procedure which seems a small price to pay.

"Snug the Palate Up Tight!"

When the bony recontouring has been completed, the palatal flap certainly cannot be positioned apically or the result would be one big hump in the middle of the vault. However, if the scallops were designed correctly the flap should hug the palatal root just covering the bone or perhaps extending onto the root surface by 1 or 2 mm—no more! Long or thick flaps must be shortened and thinned before sutur-

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BASIC FLAP MANAGEMENT

Periosteal suturing is indicated when the tissue remains intact. In fact on partial thickness flap is the ability through the use of these sutures that makes the technique.

For accurate placement of interrupted suturing, in this method the flaps are tied independently the buccal apically to the desired positional flap tightly around the arch technique.

Suturing on the maxillary easy suture removal in the flap is carried around the distal palatal buccal through the first interproximal papilla is picked up an via the same interproximal space surface of the tooth and on and so on. When passing the should be taken to ensure that it is still will be well secured. On the suture material within the gingiva and not hold the flap in the dermal end of the flap is reaches tautness of each loop so that

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![Diagram of flap surgery.](https://via.placeholder.com/150)
ing so that excess pocket depth is eliminated and the margin is knife-edge. As mentioned previously a short flap usually causes no irreversible damage. The exposed palatal bone is thick enough to repair itself and with time will be recovered by a thin layer of soft tissue displaying good contours and minimal sulcus depth.

THE COMMON SENSE OF SUITURING

Periosteal suturing is indicated in those instances where the periodontium remains intact. In fact one of the suggested advantages of the partial thickness flap is the ability to place it precisely where desired through the use of these sutures. An article by Kramer et al. demonstrates the technique well.

For accurate placement of full thickness flaps the use of the continuous suture as described by Dahlberg is recommended. Unlike interrupted suturing, in this method the facial and palatal (or lingual) flaps are tied independently thus allowing the clinician to "slingle" the buccal apically to the desired position and yet still draw the prescalloped palatal flap tightly around the necks of the teeth. Figure 16 illustrates the technique.

Suturing on the maxillary buccal begins by tying a small loop (for easy suture removal) in the flap distal to the last tooth. The suture then is carried around the distopalatal corner of this tooth and passed to the buccal through the first interproximal space to the mesial. Here the interdental papilla is picked up and the suture is returned to the palate via the same interproximal space, carried mesially around the palatal surface of the next tooth and out to the buccal to pick up the papilla, and so on. When passing the needle through each papilla, a big bite should be taken to ensure that even if part of the tip sloughs the flap will still be well secured. On the other hand it is important to keep the suture material within the gingiva and not hold the flap in the desired position. Before tying when the mesial end of the flap is reached, time should be taken to adjust the tautness of each loop so that the flap will just cover the bony

Figure 16. Diagram demonstrating continuous suture method. Only buccal flap shown. (From Johnson, R. H. J. Am. Dent. Assn. 51: 1, April 1954, with permission.)
crest—protection without pockets. Then and only then should the suture be tied. This is accomplished by making an extra turn around the last tooth as seen in Figure 16—the loose loop serves as the "double short end" and the knot is tied. At no time is the palatal flap included in this suture.

If a vertical incision was made to gain relaxation at the mesial of the buccal flap, it should be closed first by means of a couple of interrupted sutures before starting the continuous suture. Otherwise the flap can be displaced to the distal as seen in Figure 17.

The palatal flap is sutured in an identical manner only this time the loops are drawn tightly to the buccal as the suture weaves its way mesially from the distopalatal aspect of the terminal tooth.

The maxillary tuberosity (or retromolar triangle) may require 1 or 2 interrupted sutures for good closure.

Good flap adaptation to the underlying bone is of utmost importance to prevent dead spaces and hemorrhage beneath the flap. A few minutes should be spent applying pressure with a wet gauze to ensure that the flap is resting in the desired position before the dressing is placed. The periodontal dressing is a "Band-Aid" for patient comfort and is not to be used to ram the flaps apically in a haphazard fashion.

"Don't Get Yourself All Tied Up in Knots!"

During the past few years the makers of tissue adhesives (and a few independent researchers as well[18,19]), have sung the praises of the butyl cyanoacrylates as substitutes for traditional suturing. Available in Canada as Histoacryl Blue* the material (at the time of writing) is not on the American market. Initially somewhat tricky to use, the material has good adhesive properties and is an excellent hemostatic agent. Application is faster than suturing, and some clinicians claim that healing is accelerated due to the absence of needle punctures in the flap. Good flap adaptation or proper placement of a free gingival graft is absolutely essential before applying a few drops of the adhesive. The blue color aids in the detection of seepage under a loose flap—an event which can lead to complications. Cyanoacrylates also have been recommended for covering palatal donor sites of free gingival grafts, gingivectomy wounds, and painful ulcers such as recurrent aphthae.

"Take Another Look"

In their eagerness to cut another quadrant, students often ignore the "touch-ups" usually required in the immediate postoperative period. If healing is uneventful the periodontal dressing and sutures can be removed in 7 to 10 days. At this visit the surgical site is cleaned with something like Gly-Oxide® and a Q-tip and any excess granulation

*Tri-Hawk International Traders Ltd., 8250 Maryland St., Montreal, Quebec, H4P
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International Pharmaceutical Corp., Warrington, Pa.

Figure 17. A. Accidental distal displacement could have been avoided by closing first. B. Mother nature at work. Area seen i
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Figure 17. A, Accidental distal displacement of the flap by the continuous sling suture could have been avoided by closing the vertical incision on the mesial of the cuspid first. B, Mother nature at work. Area seen in A after nine weeks of healing.

Figure 18. Bulbous papillae in need of gingivoplasties to create more physiologic contours.
tissue is removed with a sharp curet. Opinions differ on the value of redressing the area. Corn prefers to replace the dressing twice (at 10 and 20 days postoperatively) whereas some clinicians like to eliminate the dressing as soon as the patient can tolerate it. Two or three weeks after surgery it is important to manucure any irregular configurations present in the healing flaps (Fig. 18). This can be accomplished with a high-speed gingivoplasty diamond and lots of water, a scalpel, or soft-tissue nippers. The goal, of course, is to eliminate periodontal pockets and create physiologic defective contours that will aid the patient in his or her plaque control efforts.

SOME POINTS TO REMEMBER

1. In most situations a full thickness flap can be used.
2. In the presence of thin bone and dehisences a partial thickness flap may be indicated.
3. In reflecting a flap as much gingiva as possible should be retained.
4. The palatal flap should be scalloped so that the margin ends up at the crest of the bone.
5. A flap must be reflected in a relaxed manner.
6. Vertical releasing incisions should be used only where necessary and then not over the prominence of a root and not on the palatal or lingual of third molars.
7. Careful use of a scalpel is necessary to prevent perforating the base of the flap.
8. Prudence is in order before trying to gain additional gingiva through apical positions of flaps.
9. Attention must be paid to suturing to ensure correct flap placement.
10. The healing surgical site should not be forgotten as gingivoplasties may be needed.

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