

The surgical phase of therapy

Phase II Periodontal Therapy

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Periodontal flaps are used in surgical periodontal therapy to accomplish the following:

1. Access for root instrumentation
2. Gingival resection
3. Osseous resection
4. Periodontal regeneration.

Advantages of flap operation

1. Existing gingiva is preserved.
2. The root surfaces, marginal alveolar bone and furcation areas are exposed.
3. The flap can be returned to its original position or displaced apically ,coronally or laterally.
4. The post operative period, usually causes less discomfort to the patient compared to gingivectomy.

To fulfill these purposes five different flap techniques are used:

- (1) The modified Widman flap.
- (2) the undisplaced flap.
- (3) the apically displaced flap.
- (4) the papilla preservation flap.
- (5) and the distal terminal molar flap.

Classification of Flaps

Based on bone exposure after flap reflection

- Full thickness flap: includes epithelium and periosteum elevated from underlying bone
- Partial thickness flap(split flap): includes epithelium and C.T reflected from bone and periosteum.

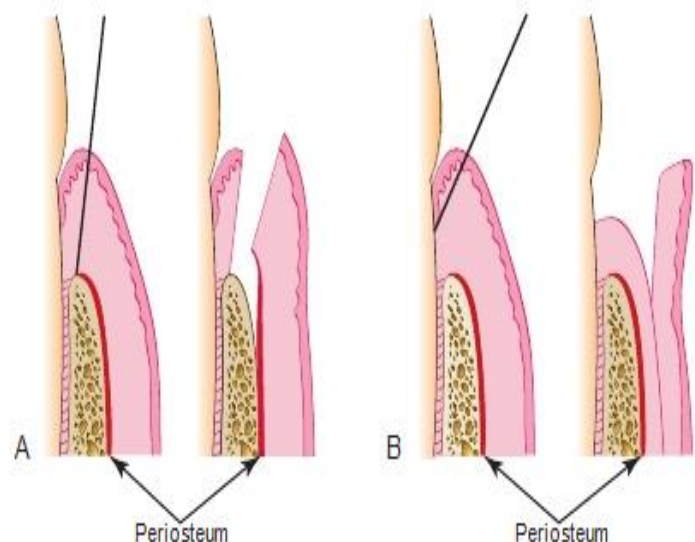
Based on flap placement after surgery

- Non displaced flaps
- Displaced flaps

Based on the management of the papilla

- Conventional flap
- Papilla preservation flap.

Figure 57-1 A, Diagram of the internal bevel incision (first incision) to reflect a full-thickness (mucoperiosteal) flap. Note that the incision ends on the bone to allow for the reflection of the entire flap. B, Diagram of the internal bevel incision to reflect a partial-thickness flap. Note that the incision ends on the root surface to preserve the periosteum on the bone.



Full-thickness flap:

All of the soft tissue, including the periosteum, is reflected to expose the underlying bone. This complete exposure and access to the underlying bone are indicated when resective or regenerative osseous surgery is contemplated. This type of flap is also called the **mucoperiosteal flap**. Elevation of a full-thickness flap requires the internal bevel incision to penetrate the periosteum, the last tissue overlying the bone. Once the periosteum has been completely incised along the length of the flap, a full-thickness flap is reflected by elevating the periosteum off the bone via blunt dissection. A periosteal elevator or curette is used to separate the periosteum from the bone by moving it mesially, distally, and apically on the bone until the desired reflection.

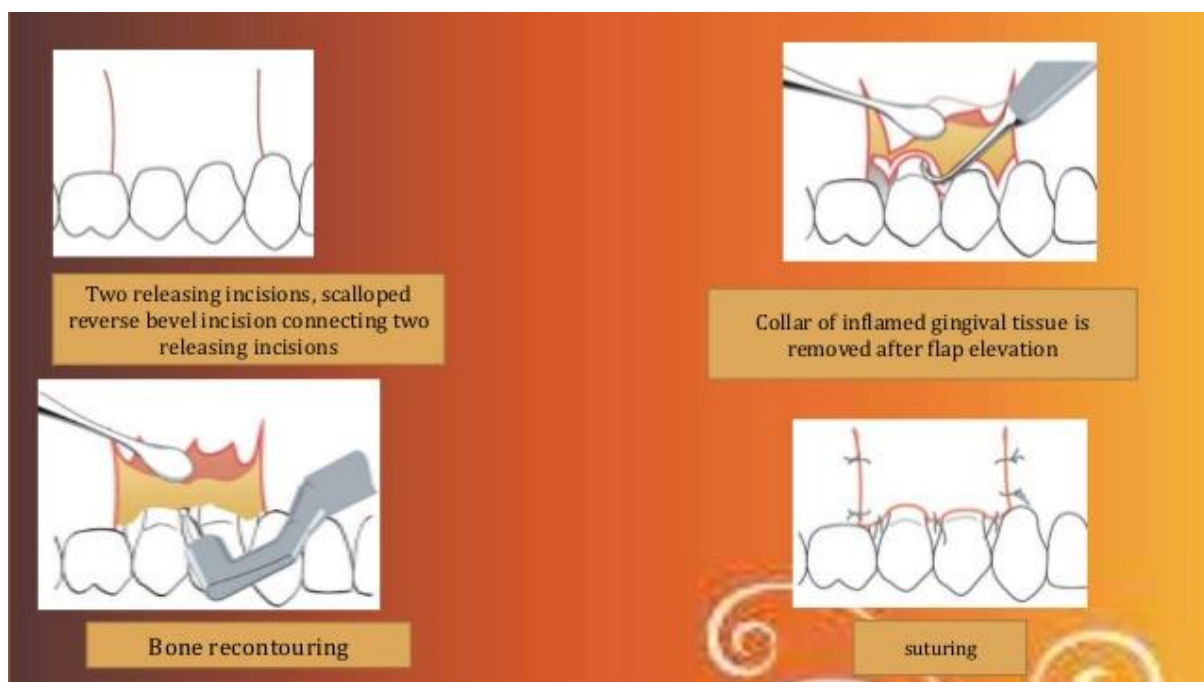
The partial-thickness flap:

Includes only the epithelium and a layer of the underlying connective tissue. The bone remains covered by a layer of connective tissue that includes the periosteum. This type of flap is also called the split-thickness flap. The partial-thickness flap is indicated when the flap is to be positioned apically or when exposure of bone is not desired. Elevation of a partial-thickness flap is completed by sharp dissection with a surgical scalpel (#15). When the tissue is thin, a flap may be elevated at full thickness slightly past the mucogingival junction and at partial thickness apical to the mucogingival junction. The combination of full-thickness and partial thickness flaps reduces the risk of flap perforation at the mucogingival junction, where the tissue is often the thinnest.

		Full-thickness flap	Partial-thickness flap
1.	Technical difficulty	Relatively easy	Difficult
2.	Bone defect treatment	possible	Difficult
3.	Blood supply to flaps	sufficient	decreased
4.	Use with mucogingival surgery	impossible	possible
5.	Bleeding	less	much
6.	post operative swelling	less	sever
7.	post operative pain	less	much
8.	Possibility of flap penetration	less	much
9.	Augmentation of the band of attached gingiva	possible	possible

Modified Widman Flap

The original Widman flap used two vertical releasing incisions connected by a submarginal scalloped internal bevel incision to demarcate the area of surgery. A full-thickness flap was reflected and the marginal collar of tissue was removed to provide access for root instrumentation and osseous recontouring.



In 1974, Ramfjord and Nissle published the “modified Widman flap, which used only horizontal incisions.

This technique offers:

- (1) the possibility of establishing an intimate postoperative adaptation of healthy collagenous connective tissue to tooth surfaces.
- (2) it provides access for adequate instrumentation of the root surfaces.
- (3) immediate closure of the area.

The step-by-step technique for the modified Widman flap is as follows:

Step 1: The first incision (Fig. 60.15A) parallel to the long-axis of the tooth is a scalloped internal bevel incision to the alveolar crest starting 0.5 to 1 mm away from the gingival margin (see Fig. 60.14C).

Step 2: Full-thickness flaps are reflected 2 to 3 mm away from the alveolar crest (see Fig. 60.14D).

Step 3: The second, crevicular incision (Fig. 60.15B) is made in the gingival crevice to detach the attachment apparatus from the root.

Step 4: The interdental tissue and the gingival collar are detached from the bone with a third incision (Fig. 60.15C; see Fig. 60.14E and F).

Step 5: The gingival collar and granulation tissue are removed with curettes. The root surfaces are scaled and planed (see Fig. 60.14G and H). Residual periodontal fibers attached to the tooth surface should not be disturbed.

Step 6: Bone architecture is not corrected unless it prevents intimate flap adaptation. Every effort is made to adapt the facial and lingual

interdental tissue in such a way that no interdental bone remains exposed at the time of suturing.

Step 7: The flaps are stabilized with sutures (see Fig. 60.14I and J) and covered with a surgical dressing.

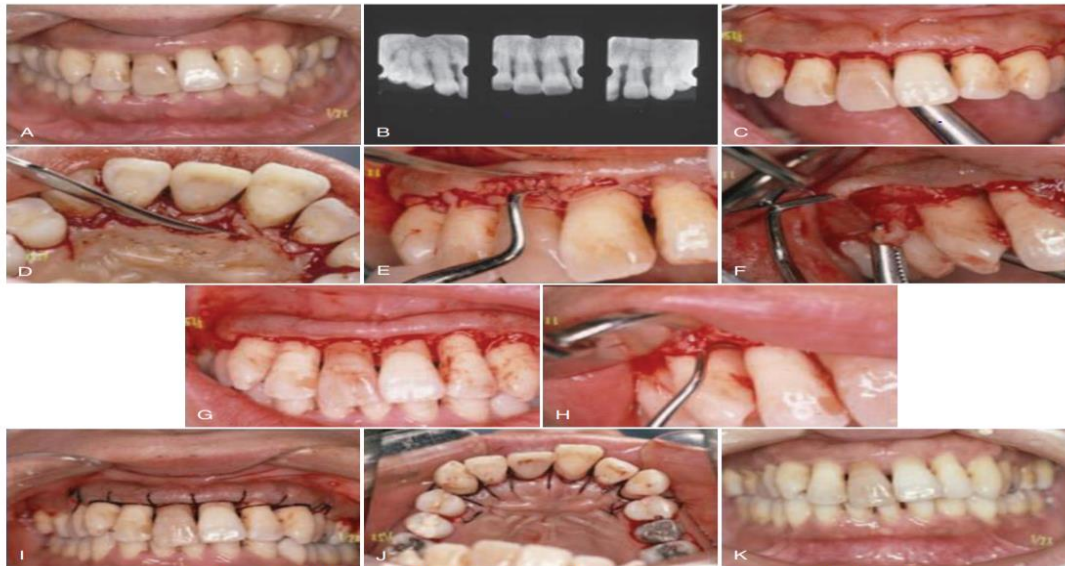


Fig. 60.14 Modified Widman flap technique. (A) Facial view before surgery. The probing of pockets revealed interproximal depths that ranged from 4 to 8 mm and facial and palatal depths of 2 to 5 mm. (B) Radiographic survey of the area. Note the generalized horizontal bone loss. (C) Facial internal bevel incision. (D) Palatal incision. (E) Elevation of the flap, which left a wedge of tissue attached to its base. (F) Removal of tissue. (G) Tissue removed and ready for scaling and root planing. (H) Scaling and root planing of exposed root surfaces. (I) Continuous, independent sling suture of facial portion of surgery. (J) Continuous, independent sling suture of palatal portion of surgery. (K) Postsurgical result. (Courtesy Dr. Kitetsu Shin, Saitama, Japan.)

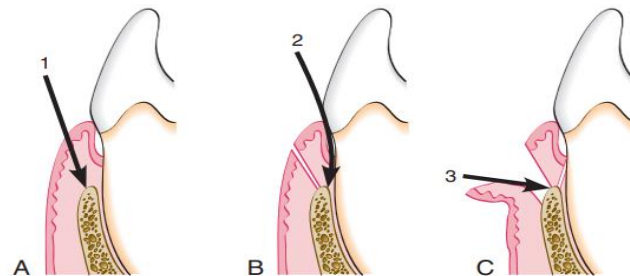
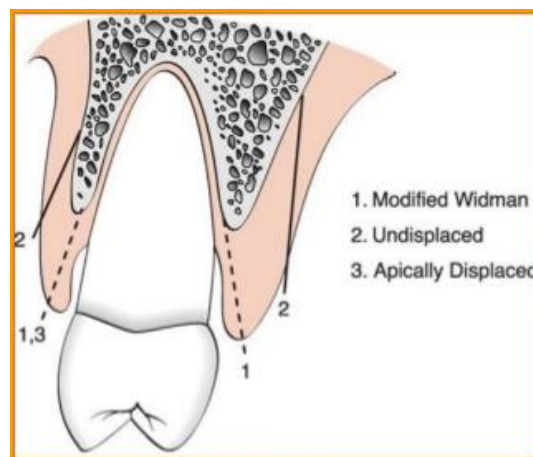


Fig. 60.15 The three incisions necessary for flap surgery. (A) First (internal bevel) incision; (B) second (crevicular) incision; and (C) third (interdental) incision.

Undisplaced Flap

Currently, the Undisplaced flap may be the most frequently performed type of periodontal surgery. For the Undisplaced flap, the submarginal scalloped internal bevel incision is initiated at a distance from the tooth that is roughly one-half to two-thirds the interdental transgingival probing depth. This incision can be accomplished only

if sufficient attached gingiva remains apical to the incision. Therefore, the two anatomic landmarks, the transgingival interdental probing depth and the mucogingival junction, must be considered to evaluate the amount of attached gingiva that will remain after surgery. The internal bevel incision should be scalloped to create surgical papillae, which are essential to covering the interdental bone (see Fig. 60.4). Proper placement of the flap margin at the alveolar crest during closure is important to prevent either recurrence of the pocket or exposure of bone. The step-by-step technique for the Undisplaced flap is as follows:



Apically Displaced Flap

Advantages:

- (1) Provides accessibility and eliminates the pocket .
- (2) Preserves or increases the width of the attached gingiva by transforming the previously unattached keratinized pocket wall into attached tissue.

Disadvantages:

Root exposure may cause esthetic problems ,hypersensitivity and increased risk of root caries.

The apically displaced flap is selected for cases that present with a minimal amount (3mm) of attached gingiva. For this reason, the internal bevel incision should be made as close to the tooth as possible (i.e., 0.5 to 1.0 mm). No need exists to determine where the bottom of the pocket is in relation to the incision for the apically displaced flap as one would for the undisplaced flap. The flap is placed at the tooth–bone junction by apically displacing the flap. Its final position is not determined by the placement of the first incision. With some variants, the apically displaced flap can be used for pocket eradication, widening the zone of attached gingiva, or both. Depending on the purpose, the apically displaced flap can be a full-thickness flap or a split-thickness flap. The step-by-step technique for the apically displaced flap is as follows:

Step 1: A marginal scalloped internal bevel incision parallel to the long axis of the tooth is made down to the crest of bone (Fig. 60.17).

Step 2: If used, vertical incisions are made extending beyond the mucogingival junction. It is important that the vertical incisions—and therefore the lap elevation—reach past the mucogingival junction to provide adequate mobility to the lap for its apical displacement.

Step 3: The flap is reflected in full thickness or partial thickness, depending on the thickness of the gingiva and the objective of the surgery.

Step 4: Crevicular and interdental incisions are made, and the marginal collar of tissue is removed.

step 5: After degranulation, scaling and root planing, and osseous surgery if needed, the lap is displaced apically.

Step 6: If a full-thickness lap was relected, an independent sling suture positions the lap margin at the alveolar crest, and a surgical dressing can prevent its coronal movement. If a partial-thickness lap was relected, it can be apically displaced with an independent sling suture, and further stabilized with periosteal sutures. A periodontal dressing can prevent its coronal movement.

After 1 week, dressings and sutures are removed. The area is usually repacked for another week, after which the patient is to brush gently along the gingival margin with a soft brush and interdentally with interdental brushes.



Fig. 60.17 An apically displaced flap. (A) and (B) Facial and lingual preoperative views. (C) and (D) The facial and lingual flaps have been elevated. (E) and (F) After debridement of the areas. (G) and (H) The sutures are in place. (I) and (J) Healing after 1 week. (K) Healing after 2 months. Note the preservation of attached gingiva displaced to a more apical position. (Courtesy Dr. Thomas Han, Los Angeles, CA.)

Contraindications

1. Periodontal pockets in esthetic areas.
2. Deep infrabony defects.
3. Patients at high risk for caries .
4. Sever hypersensitivity.
5. Teeth with sever attachment loss and unfavorable clinical crown/root ratio .

Papilla Preservation Flap:

- It is done to preserve the interdental soft tissue for maximum soft tissue coverage following surgery in interdental region.
- For aesthetic purpose in maxillary anterior region.

- There must be adequate interdental space.
To allow the intact papilla to be reflected with the facial or lingual/palatal flap.

When the interdental space is very narrow, thereby making it impossible to perform a papilla preservation flap, a conventional flap with only crevicular incisions is made

In current regenerative therapy, bone grafts, membranes, or a combination of these are used with or without other biologics. The flap design should maximize the amount of gingival tissue and papilla retained to cover the material placed in the osseous defect. In the aesthetic area, when surgery is necessary, flap design must minimize recession and loss of interdental papillae. As such, the crevicular incision is the incision of choice for the anterior aesthetic area and regenerative therapy. The interdental papilla is retained with the papilla preservation technique when the interdental space is adequate for reflection of the intact papilla; otherwise, it is split beneath the contact point of the two approximating teeth. The flap is elevated in full thickness without thinning of the flap or the papilla. **The step-by-step technique for the papilla preservation flap** (see Fig. 60.8; Fig. 60.24) is as follows:

Step 1: A crevicular incision is made around each tooth, with no incisions across the interdental papilla.

Step 2: The preserved papilla can be incorporated into the facial-buccal flap (original papilla preservation technique) or lingual-palatal flap (modified papilla preservation technique). If the preserved papilla is reflected with the facial-buccal flap, the semilunar incision at the base of the papilla is on the lingual-palatal side of the interdental space. If the preserved papilla is reflected with the lingual-palatal flap, the semilunar incision at the base of the papilla is on the facial-buccal side of the interdental space. This semilunar incision dips apically

from the line angles of the tooth so that the incision is at least 5 mm from the crest of the papilla.

Step 3: The papilla is then elevated with an Orban knife or curettes and is reflected intact with the flap.

Step 4: The flap is reflected without thinning the tissue.



Fig. 60.24 Papilla preservation flap. (A) Facial view after sulcular incisions have been made. (B) Straight-line incision in the palatal area about 3 mm from the gingival margins. This incision is then connected to the margins with vertical incisions at the midpart of each tooth. (C) Papillae are reflected with the facial flap. (D) Lingual view after the reflection of the flap. (E) Lingual view after the flap is brought back to its original position. It is then sutured with independent sutures. (F) Facial view after healing. (G) Palatal view after healing. (Courtesy Dr. Thomas Han, Los Angeles, CA.)

Distal Terminal Molar Flap:

The treatment of periodontal pockets on the distal surface of terminal molars is often complicated by the presence of bulbous fibrous tissue over the maxillary tuberosity or prominent retromolar pads in the mandible.

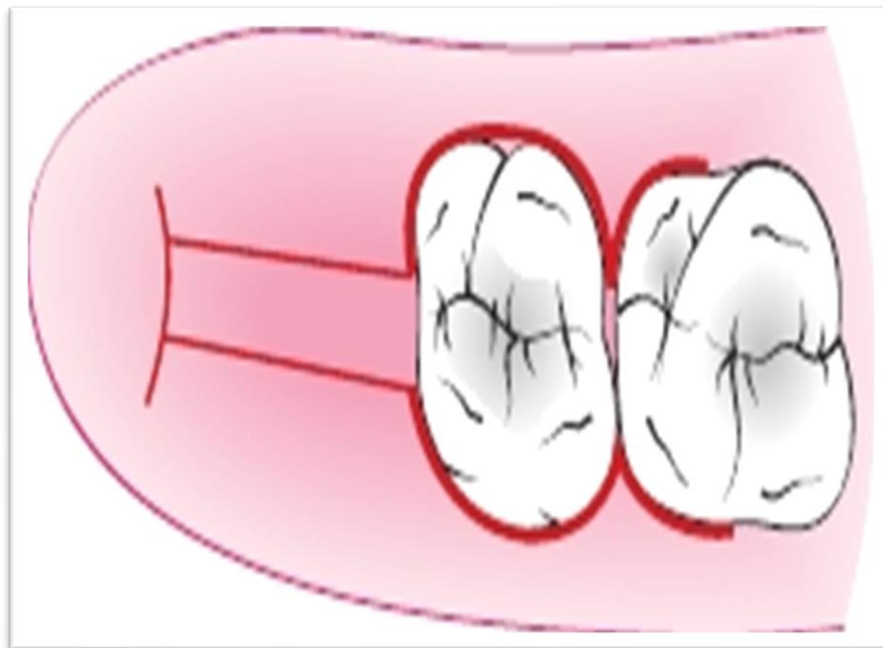
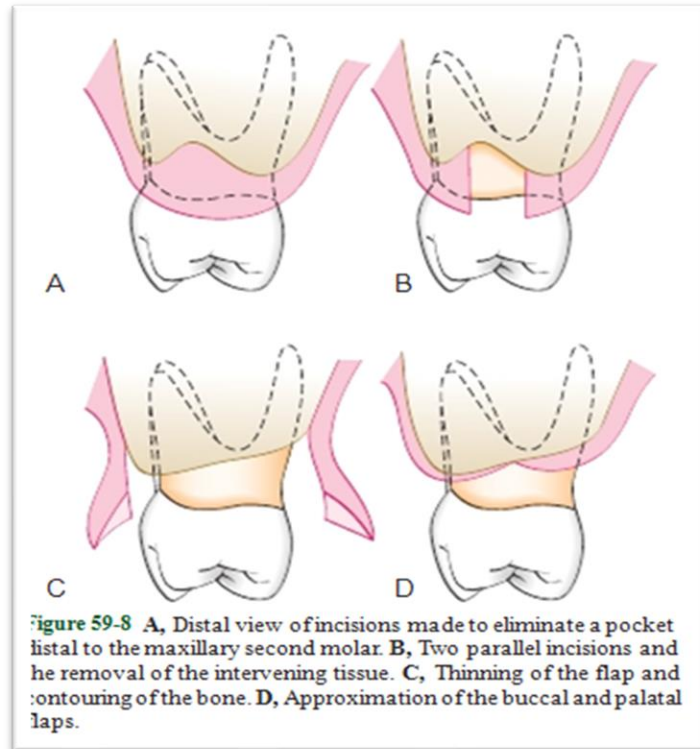
Treatment of distal pockets on the maxillary arch is usually simpler than the treatment of a similar lesion on the mandibular arch, because :

- 1-** The tuberosity presents a greater amount of fibrous attached gingiva than does the area of the retromolar pad.

2- The anatomy of the tuberosity that extends distally is more adaptable to pocket elimination than is that of the mandibular molar arch, where the tissue extends coronally.

Gingivectomy incision is the most direct approach to the treatment of distal pockets of the distal maxillary molars that have adequate attached gingiva and no osseous lesions. The incision is started on the distal surface of the tuberosity and carried forward to the base of the pocket on the distal surface of molar.

However, when only limited amounts of keratinized gingiva are present, or if a distal angular bony defect has been diagnosed, the distal wedge procedure facilitates access to the osseous defect, preserve sufficient amount of keratinized tissue and produces a primary closure wound.



Modifications of the distal wedge procedure on mandibular molars

- ◉ Incision designs for surgical procedures distal to the mandibular second molar.
- ◉ The incision should follow the areas of greatest attached gingiva and underlying bone.

