Periodontal surgery

Periodontal surgery is any surgical procedure used to treat periodontitis or modify the shape of periodontium.

The patient should be adequately prepared medically, psychologically, and practically for all aspects of intervention

Main objective of periodontal surgery is to contribute to the long-term preservation of the periodontium by facilitating plaque removal and its control . Patient preparation is an important aspect of the intervention.

Indication of periodontal surgery:

• Impaired access for SRP

• Root fissures

• Root concavities

• Furcation's

• Defective margins of restorations in the subgingival area

• Gross gingival Deformities

• To facilitate proper restorative therapy.

Contraindication:

• Poor patient cooperation

• Cardiovascular diseases

• Pt. With bleeding disorders

• Hormonal and metabolic disorders

• Smoking

General principle of periodontal surgery:

1- Patient preparation

•Re-evaluation after phase I therapy

Almost every patient undergoes the so-called initial or preparatory phase of therapy, which basically consists of thorough scaling and root planning and responsible for the periodontal inflammation. These removing all irritants procedures eliminate some lesions entirely and render tissues more firm and consistent, thus permitting a more accurate and delicate surgery

•Premedication

For patients who are not medically compromised, the value of administering antibiotics routinely for periodontal surgery has not been indicated ,although some studies have reported reduced postoperative complications including reduced pain and swelling when antibiotics are given before periodontal surgery and continuing for 4 to 7 days after surgery. In some cases administration of NSAID like Ibuprofen 1 hour befor the surgery and oral rinse with 0.12% chlorhexidineis found beneficial

•Smoking

•Informed consent

2. Check for emergency equipment:

The operator , all assistant and office personal should be trained to handle all emergencies that may arise. Drugs and equipment for emergency use should be ready available at all times

3. Measures to prevent transmission of infection

They include the use of disposable sterile gloves, surgical masks, and protective eyewear . All surfaces possibly contaminated with blood or saliva that cannot be sterilized (such as light handles and unit syringes) must be covered with aluminum foil or plastic wrap. Aerosol-producing devices,

such as the Cavitron, should not be used on patients with suspected infections.

4-Sedation and Anaesthesia : .

Periodontal surgery should be performed painlessly. The patient should be assured of this at the onset and throughout the procedure. Most reliable means of painless surgery by administration of the local anesthesia. Apprehensive & neurotic patients require sedatives and hypnotics , I.V. Benzodiazepins can be used to achieve greater level of sedation in patients with severe level of anxiety but with caution.

5-Tissue manegment

Operate gently and carefully , observe the patient at all times , facial expressions, pallor and perspiration are distinct signs that may indicate that patient is experiencing pain . Be certain the instruments are sharp . Dull instruments inflict unnecessary trauma .

6- Scaling and root planning

Debridement of all exposed root surfaces should be carefully explored and planed.

7-Hemostasis

Importance of hemostasis:

1. Accurate visualization of the extent of the disease, pattern of bone destruction, anatomy and condition of roots

2. Provides clear view for debridement

3. Prevents excess loss of blood from the body

Periodontal surgeries can produce profuse bleeding during initial incisions and flap reflection and upon removal of granulation tissue, bleeding is considerably reduced .

Methods to control bleeding from capillaries :

Application of cold pressure to the site with moist gauze (soaked in a sterile ice water) .

Use of local anaesthetic with the vasoconstrictor .

Absorbable gelatin sponge like Oxidized cellulose.

If a medium or large vessel is lacerated, a **suture** around the bleeding end is necessary for the hemostasis.

General considerations for instruments used in periodontal surgery

• Incision and excision (periodontal knives)

• Deflection and readaptation of mucosal flaps (periosteal elevators)

• Removal of adherent fibrous and granulomatous tissue (soft tissue rongeurs and tissue scissors)

• Scaling and root planing (scalers and curettes)

• Removal of bone tissue (bone rongeurs, chisels and files)

• Root sectioning (burs)

• Suturing (sutures and needle holders, suture scissors)

• Application of wound dressing (plastic instruments)

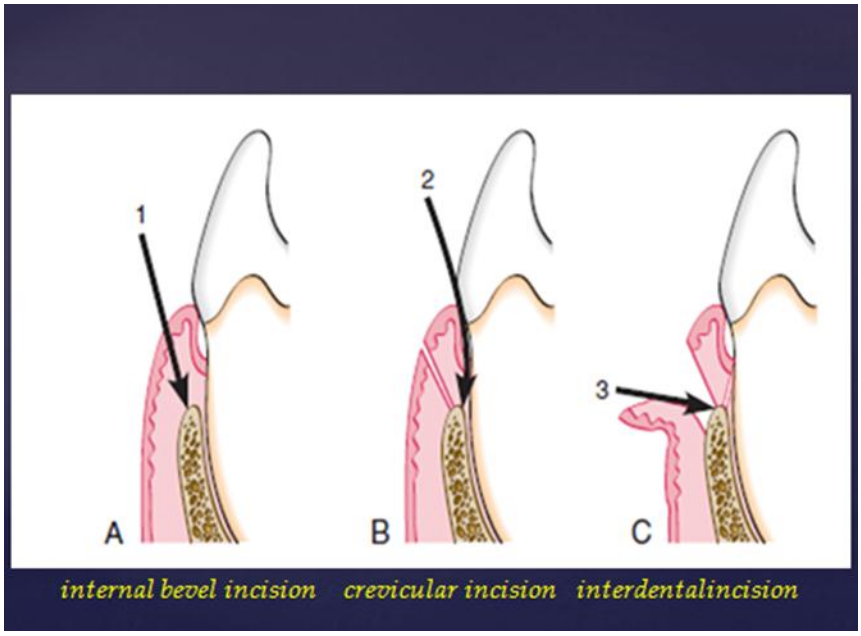
Types of incisions in periodontal sugery

A-Horizontal incision

1-Internal bevel incision (the basic incision in periodontal flap surgery)

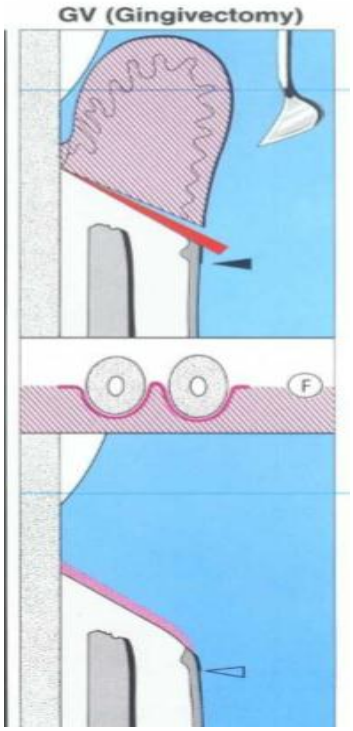
2-Crevicular incision

3-Interdental incision

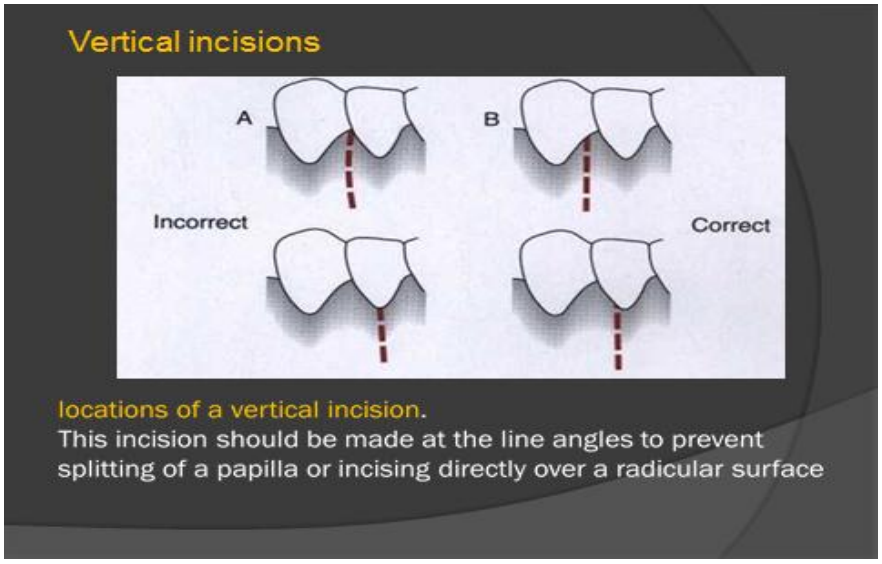


4-External bevel incision (gingivactomy incision)

Beveled at 45 degree to the tooth surface



B-Vertical incisions



Gingivectomy

This surgical procedure aimed at the excision of the soft tissue wall of a pathologic periodontal pocket and this pocket elimination was usually combined with recontouring of the diseased gingiva to restore physiologic form(e.g. Drugs induced gingival enlargement and the resulting false pocket can be removed by this method).

Indication:

1-Gingival enlargement or over growth

2-Idiopathic gingival fibromatosis.

3-Shallow suprabony pocket

4-Minor corrective procedure

Contraindication:

1-Infrabony pocket

2-Thickening of marginal alveolar bone and the need for bone surgery

3-Attached gingiva is narrow or absent

Advantages:

1-Technically simple, good visual access

2-Complete pocket elimination

3-Restoration of a physiologic gingival contour

Disadvantages:

1-Gross wound, post operative pain

2-Healing by secondary intention

3-Danger of exposing bone

4-Loss of attached gingiva

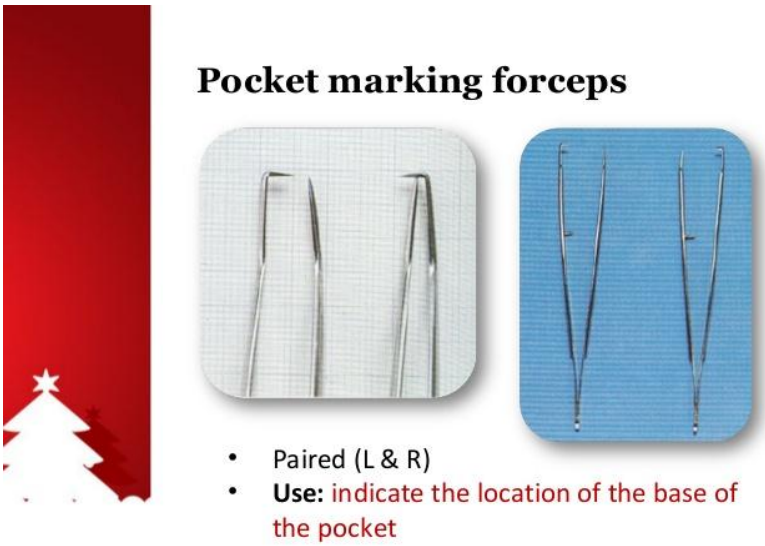
5-phonetics and aesthetic problem in the anterior area with sensitivity due to exposure of the cervical area of tooth.

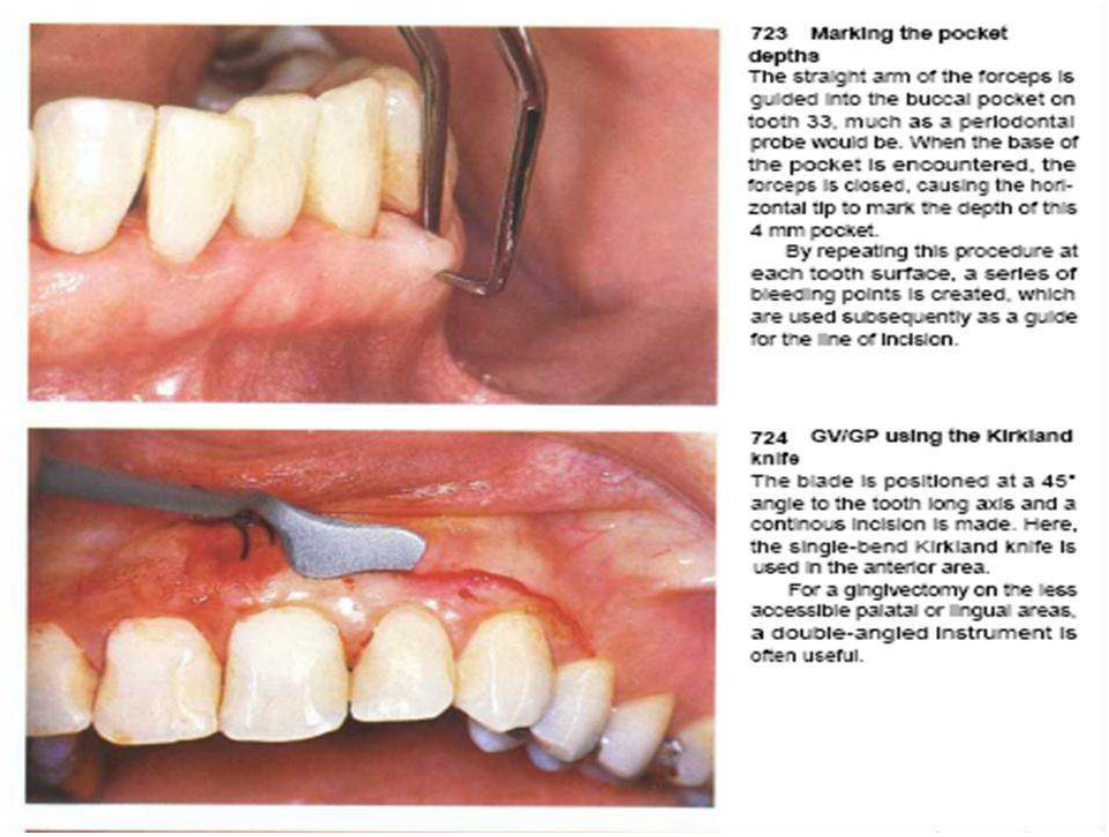
Goldman gingivectomy procedure:

1-giving local anesthesia

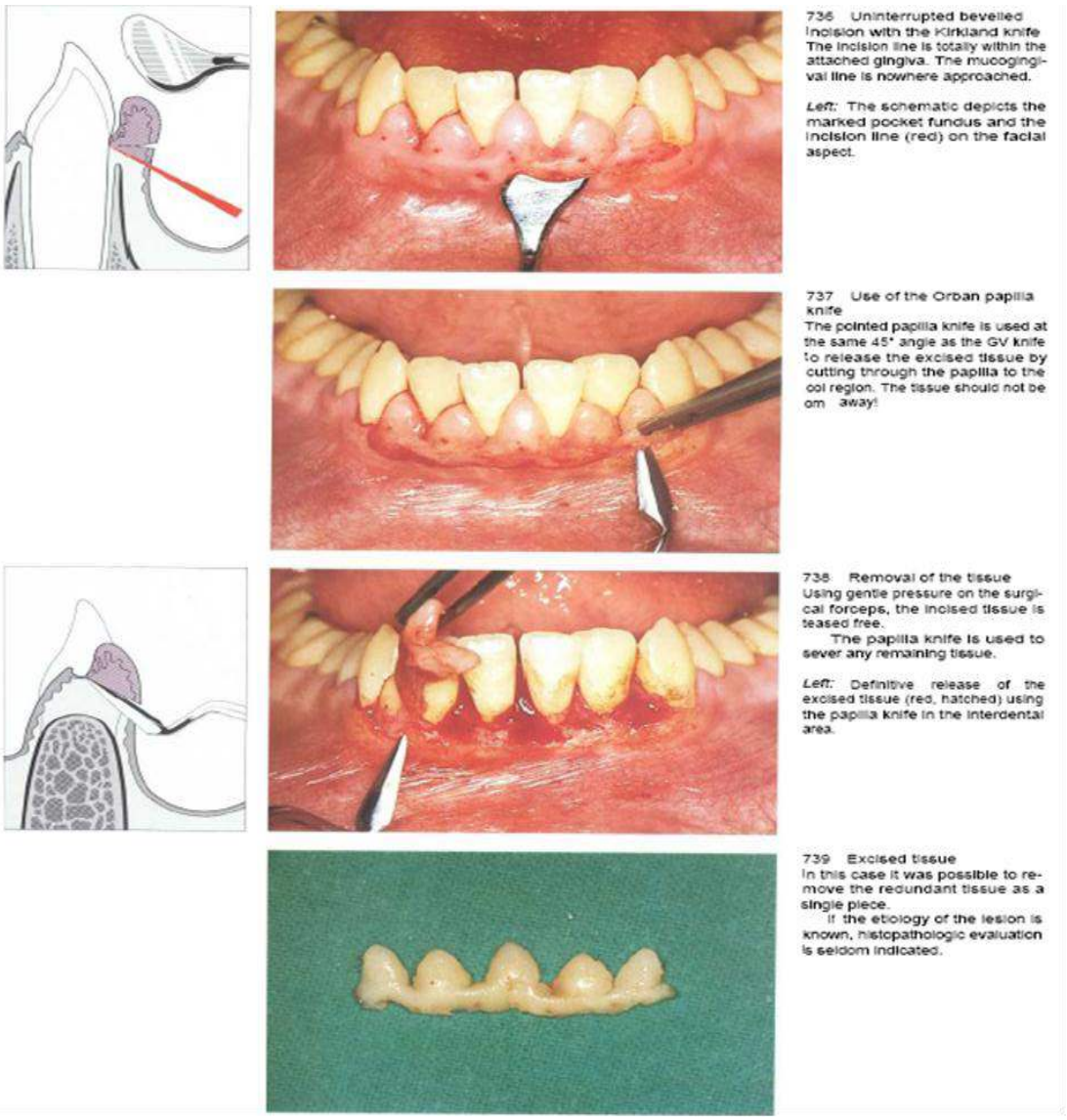
2-marking the pocket depth: the straight arm of pocket depth marker forceps is guided into buccal pocket, when the base of pocket is encountered,the forceps is pinched together causing the horizontal forceps tip to mark depth of pocket, by repeating this procedure at each tooth surface ,a series of

bleeding points is created, which are used subsequently as a guide for incision.





3. Primary beveled incision which carried out 1 mm apical to bleeding points by Kirkland knife (45 degree to get Knife edge shaped gingiva).



736 Uninterrupted bevelled incision with the Kirkland knife
The incision line is totally within the attached gingiva. The mucogingival line is nowhere approached.

Left: The schematic depicts the marked pocket fundus and the incision line (red) on the facial aspect.

737 Use of the Orban papilla knife
The pointed papilla knife is used at the same 45° angle as the GV knife to release the excised tissue by cutting through the papilla to the col region. The tissue should not be cut away!

738 Removal of the tissue
Using gentle pressure on the surgical forceps, the incised tissue is teased free.
The papilla knife is used to sever any remaining tissue.

Left: Definitive release of the excised tissue (red, hatched) using the papilla knife in the interdental area.

739 Excised tissue
In this case it was possible to remove the redundant tissue as a single piece.
If the etiology of the lesion is known, histopathologic evaluation is seldom indicated.

4.Secondary incision to separate the interproximal soft tissues from the interdental periodontium by Orban knife.

5. Careful removal of the incised tissues by a currete or a cumine.

6. By curette remove plaque, calculus and granulation tissues then smoothing teeth surfaces.

7. Use Kirklaned knife for gingivoplasty(minor alterations in gingival morphology without tissue excision)by shaving wound margin to create thin margin.

8.Control bleeding by placing gauze packs Put dressing to cover the wound with pressure to prevent the bleeding with consequence formation of granulation tissue under dressing and without interference with occlusion or mobile mucosa.

740 Scaling and root planing with direct vision
Even when scaling during initial therapy has been performed with great care, residual plaque and calculus may be revealed after tissue removal.
Therefore the most important step in treatment during gingivectomy is cleaning and smoothing of any exposed root surfaces. In this way, a biologically compatible surface is created forthe newjunctional epithelium that must form.



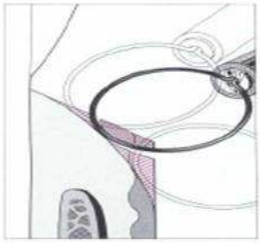
741 Gingivectomy wound after scaling
The teeth are clean.
The incision line/wound margin remains relatively sharp, despite the 45° angulation of the initial incision. This edge must be rounded in order to provide ideal gingival contour after healing.



742 Smoothing the "sharp edge"
The number 12 electrosurgical loop is indicated for this fine contouring step. Light, smooth and rapid movement of the electrosurgical tip will prevent overheating the tooth and preclude any osseous contact. The electrosurgical instrument should not be adjusted too high. Tissue must not be burned and no "smoke" should develop.

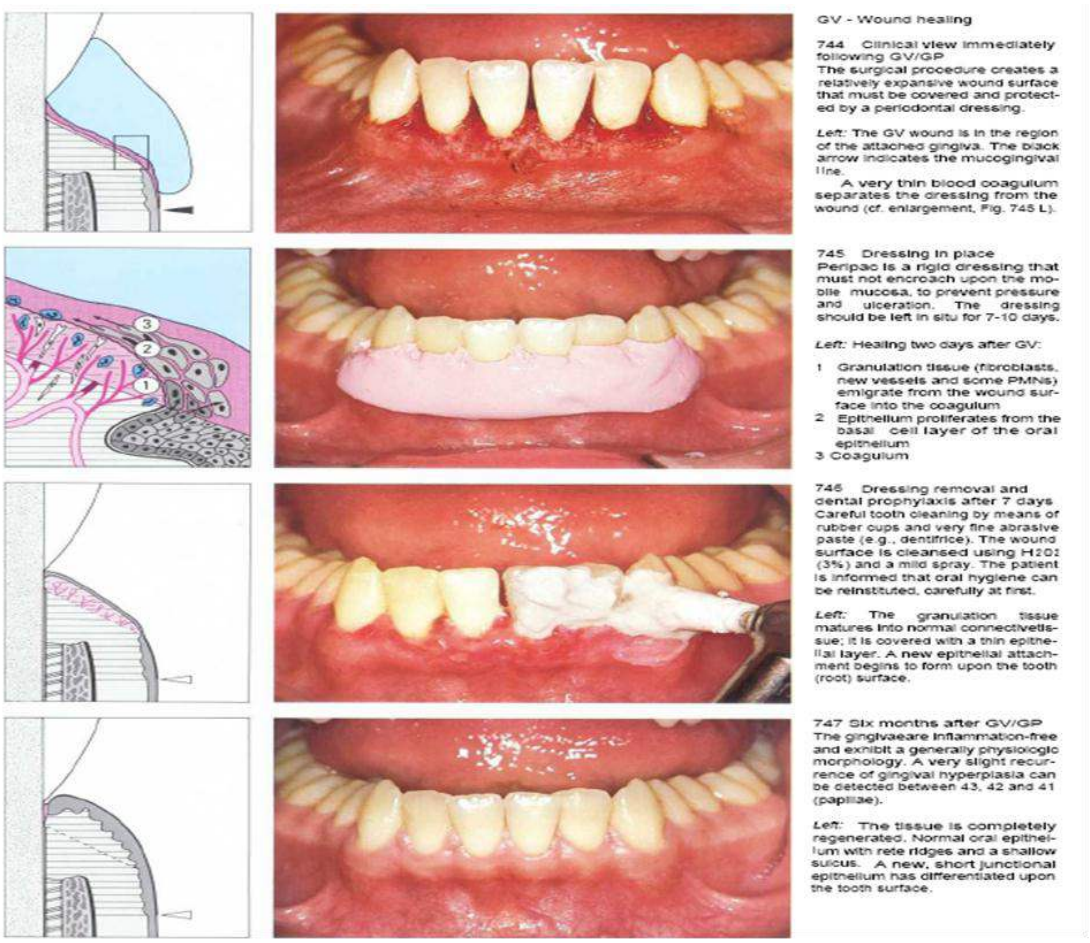
Right: Rounding of the incision margin using the electrosurgical loop.





743 Cleansing the wound
The Kirkland knife is used to scrape away residual tissue tags or debris. In this case, recontouring extended bilaterally to the first premolars.





GV - Wound healing

744 Clinical view immediately following GV/GP
The surgical procedure creates a relatively expansive wound surface that must be covered and protected by a periodontal dressing.

Left: The GV wound is in the region of the attached gingiva. The black arrow indicates the mucogingival line.
A very thin blood coagulum separates the dressing from the wound (cf. enlargement, Fig. 745 L).

745 Dressing in place
Peripac is a rigid dressing that must not encroach upon the mobile mucosa, to prevent pressure and ulceration. The dressing should be left in situ for 7-10 days.

Left: Healing two days after GV:

1 Granulation tissue (fibroblasts, new vessels and some PMNs) emigrate from the wound surface into the coagulum
2 Epithelium proliferates from the basal cell layer of the oral epithelium
3 Coagulum

746 Dressing removal and dental prophylaxis after 7 days
Careful tooth cleaning by means of rubber cups and very fine abrasive paste (e.g., dentifrice). The wound surface is cleansed using H_2O_2 (3%) and a mild spray. The patient is informed that oral hygiene can be reinstituted, carefully at first.

Left: The granulation tissue matures into normal connective tissue; it is covered with a thin epithelial layer. A new epithelial attachment begins to form upon the tooth (root) surface.

747 Six months after GV/GP
The gingivaeare inflammation-free and exhibit a generally physiologic morphology. A very slight recurrence of gingival hyperplasia can be detected between 43, 42 and 41 (papillae).

Left: The tissue is completely regenerated. Normal oral epithelium with rete ridges and a shallow sulcus. A new, short junctional epithelium has differentiated upon the tooth surface.

Periodontal flap:

Main objectives of flap procedure

1-Facilitate the debridement of the root surfaces, the removal of the pocket epithelium and the inflamed c.t.

2-Eliminate the deepened pockets (the original Widman).

3-Cause a minimal amount of trauma to the periodontal tissue and discomfort to the patient.

Advantages of flap operations include:

1--Existing gingiva is preserved

2--The marginal alveolar bone is exposed where by the morphology of bony defects can be identified and the proper treatment rendered

3--Furcation areas are exposed, the degree of involvement and the "tooth–bone" relationship can be identified

4--The flap can be repositioned at its original level or shifted apically, thereby making it possible to adjust the gingival margin to the local conditions

5--The flap procedure preserves the oral epithelium and often makes the use of surgical dressing additionally

6--The post-operative period is usually less discomfort to the patient when compared to gingivectomy.

Classification of flaps :

Based on Bone exposure after flap reflection :

•Full thickness (mucoperiosteal)

•Partial thickness (mucosal)

Based on Placement of the flap after surgery :

•Non displaced flaps

•Displaced flaps

Based on theManagement of the papilla :

•Conventional flaps

•Papilla preservation flaps

Indications:

1-In treatment of infrabony pockets.

2-When the gingivectomy will lead to an unacceptable aesthetic results.

3-Osseous recontouring (elimination of bony defect).

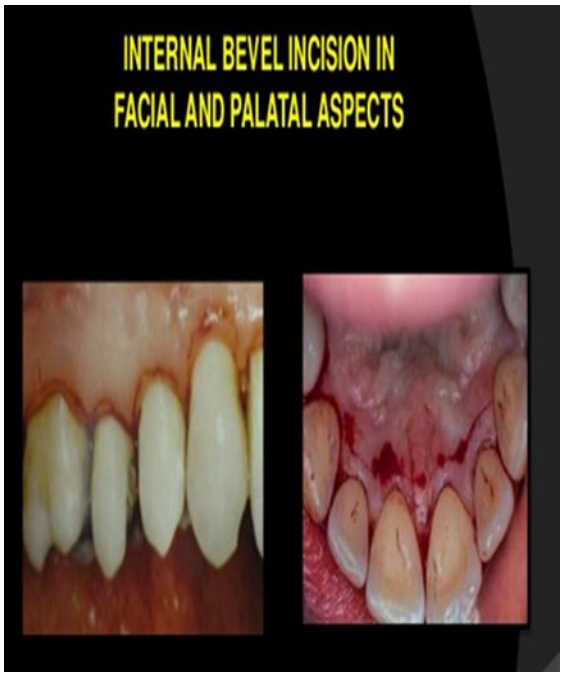
Modified widman flap procedure:

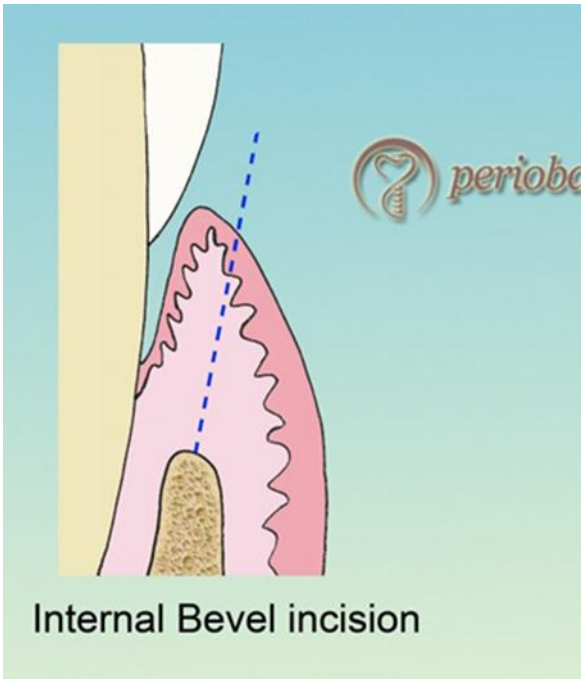
Reported in 1974 by Ramfjod and Nissle,it is a replaced flap.There are three incisions in this flap,it is usually conducted as following:

***Primary incision*:**

a:First incision-internal bevel incision

The scalloped incision is performed on both labial and palatal aspects,using the double-edge 12D scalpel.It is an **internal bevel incision** extending to the alveolar crest. This incision thins the gingival tissue and permits complete closure of the interdental osseous defects postoperatively. The distance of the incision from the gingival margin may vary from 0.5 to 2mm.





b:Flap reflection

An elevator is used to raise a full thickness mucoperiosteal flap as atraumatically as possible. The flap is reflected only to permit direct visualization of the root surface and the alveolar crest. In most cases it is possible to stay within the boundaries of the attached gingiva,without extending beyond the mucogingival line.



Secondary incision:

C:Second incision-crevicular incision

This incision is carried around each tooth,between the hard tooth structure and the diseased pocket epithelium,to the depth of the junctional epithelium.The 12D scalpel is used.



Third incision:

d:Third incision-horizontal incision

The horizontal incision is carried along the alveolar crest thus separating the infiltrated tissue from healthy supporting connective tissue,specially in the interdental area.The incision also permits atraumatic removal of the diseased tissue.





e:Root planing with direct vision

Fine curettes are used to remove remnants of pocket epithelium and granulation tissue,calculas necrotic cementum to obtain smooth, hard, clean surface.Root planing is performed with repeated rinsing.Root planing is the most important part of both the modified Widman procedure and all other periodontal surgical procedures.

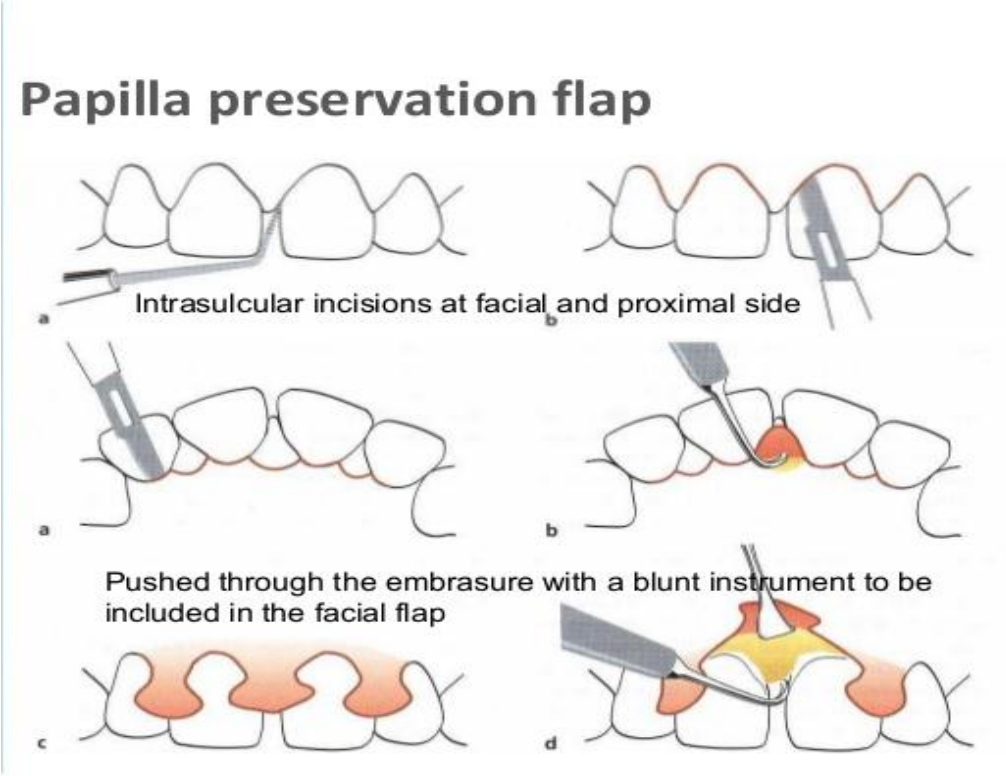
f:Complete coverage of interdental defects

The labial and palatal flaps are closed over the interdental areas without tension, using interrupted sutures. The flaps should be adapted to the underlying bond and the necks of the teeth.

#Following flap procedures and the removal of plaque, calculus and chronically inflamed granulation tissue, healing occurs by the formation of a Long junctional epithelium, this lead to reduced probing depth but that epithelium is more susceptible to plaque induced breakdown than the original connective tissue attachment and consequently post operative plaque control must be a very high standard, a new connective tissue attachment may form following flap procedures, although this cannot be predicted with certainty.

The papilla preservation flap:

In order to preserve the interdental soft tissues for maximum soft tissue coverage following surgicalintervention in interdental region for aesthetic in maxillary anterior region . There must be adequate interdental space.



Osseous surgery:

The alveolar bone loss caused by inflammatory periodontal disease often results in an uneven outline of the bone crest. The gingival contour is closely dependent on the contour of the underlying bone as well as the proximity and anatomy of adjacent tooth surfaces, the elimination of soft tissue pockets often has to be combined with osseous reshaping and the elimination of osseous craters and angular bony defects to establish and maintain shallow pockets and optimal gingival contour after surgery. Osseous surgery should be always carried out under continuous irrigation with normal saline to avoid bone necrosis.

A. Osteoplasty:

The leveling of interproximal craters and the elimination (or reduction) of bony walls of circumferential osseous defects are often referred to as “osteoplasty” since usually no resection of supporting bone is required (Figure 1). It was introduced by Friedman in 1955

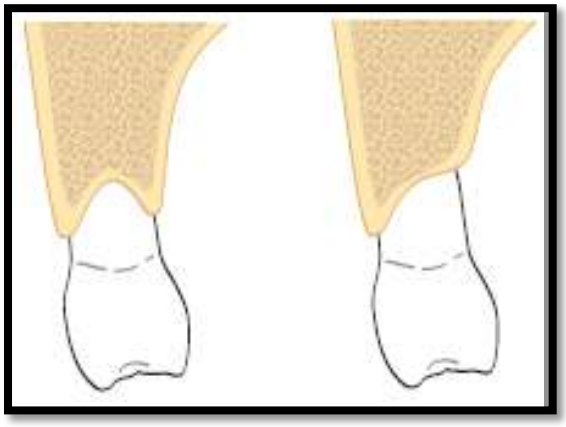


Figure 1: Osteoplasty. Leveling of an interproximal bone crater through the removal of the palatal bone wall. For esthetic reasons the buccal bone wall is maintained to support the height of the soft tissue.

Examples of osteoplasty are the thinning of thick osseous ledges and the establishment of a scalloped contour of the buccal (lingual and palatal) bone crests (Figure 2). It may be required to gain access for intrabony root surface debridement.

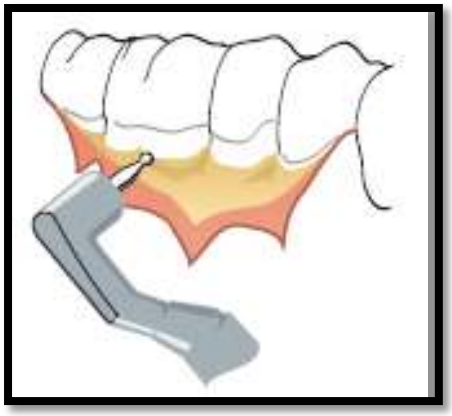


Figure 2: Osteoplasty. Thick osseous ledges in a mandibular molar region area are eliminated with the use of a round bur to facilitate optimal flap adaptation.

B. Ostectomy:

This means removal of large amounts of supporting bone (Figure 3).

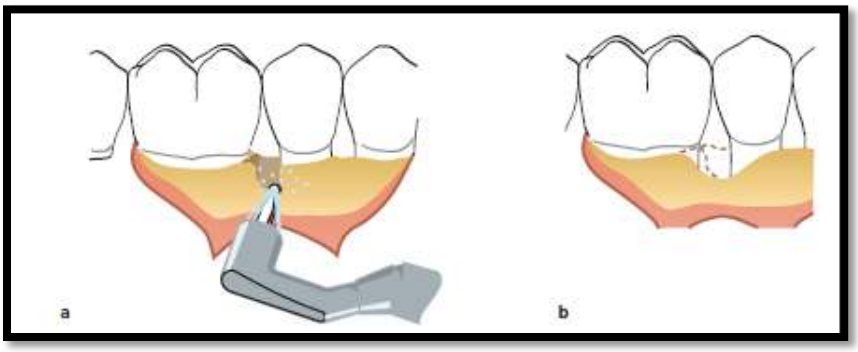


Figure 3: Ostectomy. (a) A combined one- and two-wall osseous defect on the distal aspect of a mandibular bicuspid has been exposed following reflection of mucoperiosteal flaps. Since esthetics is not a critical factor to consider in the posterior tooth region of the mandible, the bone walls are reduced to a level close to the base of the defect using rotating round burs under continuous saline irrigation. (b) The osseous recontouring completed. Note that some supporting bone has to be removed from the buccal and lingual aspect of both the second bicuspid and the first molar in order to provide a hard tissue topography which allows a close adaptation of the covering soft tissue flap.

The various treatment options available for the hard tissue defect may include:

1. Elimination of the osseous defect by resection of bone (osteoplasty and/or ostectomy).
2. Maintenance of the area without osseous resection (hoping for some type of periodontal repair, e.g. bone fill leading to gain of clinical attachment).
3. Compromising the amount of bone removal and accepting that a certain pocket depth will remain.
4. An attempt to improve healing through the use of a regenerative procedure.
5. Extract the involved tooth if the bony defect is considered too advanced.