

Phase II Surgical Therapy

In this phase the surgical techniques used for the following purposes :

1. Controlling or eliminating periodontal disease (**surgical pocket therapy**).
2. Correcting anatomic conditions that favor periodontal disease, impair aesthetics or inhibit placement of prosthetic appliances (**plastic surgery, aesthetic surgery, pre-prosthetic techniques**).
3. Placing implants to replace lost teeth and improving environment for their placement and function.

Periodontal surgery

Successful cause-related therapy (by the removal of plaque and calculus) will reduce gingival inflammation (edema, hyperemia and flabby tissue) there by making assessment of true gingival contour and pocket depth possible. In addition the soft tissue will be more fibrous and firmer, which facilitate surgical handling of the soft tissues. The propensity for bleeding is reduced, making the inspection of the surgical field easier.

The effectiveness of the patient's home care which is of **decisive** importance for the long term prognosis must be properly evaluated; lack of effective self-performed plaque control will often mean that the patient **should be excluded** from surgical treatment.

Transient root hypersensitivity and recession of the gingival margins frequently accompany the healing process following close and open S+ RP, thus the patient should be warned that these results may happen.

Objectives of periodontal surgery

- 1-Accessibility and direct vision for proper S+ RP
- 2-Reduction or elimination of plaque retentive area especially periodontal pockets that have not responded to initial therapy.
- 3-Eliminate inflamed periodontal tissue
- 4-Enhancing the regeneration of periodontal tissue
- 5-Create a physiologic morphology of the dentogingival area that will facilitate efficient self-performed plaque control
- 6-Correct mucogingival defect and improve periodontal aesthetic
- 7-Provide access to correct bony defects

Surgical treatment include

- 1-Gingivectomy**
- 2-Flap surgery**
- 3-Distal wedge procedure**
- 4-Mucogingival surgery for correction of mucogingival and aesthetic defect**
- 5-Crown lengthening**
- 6-Guided tissue regeneration (GTR)**

Gingivectomy

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

Advantage

1. Technically simple, good visual access
2. Complete pocket elimination
3. Restoration of a physiologic gingival contour

Disadvantage

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.

Basic instruments in surgical gingivectomy :-

☒ Crane kaplan pocket marker

☒ Periodontal Knives (Gingivectomy Knives):-

- ❖ **Kirkland knife:-** Is typically used for gingivectomy, used for incisions on the facial and lingual surfaces. These knives can be obtained as either double-ended or single-ended instruments. The entire periphery of these kidney-shaped knives is the cutting edge.
- ❖ **Interdental Knives:-** Used for interdental incisions. The Orban knife and the Merrifield knife are examples of knives that can be used for interdental areas. These

spear-shaped knives have cutting edges on both sides of the blade, and they are designed with either double-ended or single-ended blades.

☒ **Bard- Parker handles (scalpel)**

☒ **Bard–Parker blades (#11, #12 and #15), and scissors are used as auxiliary instruments:-** Different shapes and sizes are used in periodontal surgery. The most common blades are #12D, #15, and #15C . The #12D blade is a beak-shaped blade with cutting edges on both sides that allow the operator to engage narrow, restricted areas with both pushing and pulling cutting motions. The #15 blade is used for thinning the flaps and is also used for general purposes. The #15C blade, which is a narrower version of the #15 blade, is useful for making the initial, scalloping-type incision. The slim design of this blade allows for incising into the narrow interdental portion of the flap. All of these blades are discarded after one use.



Fig.:- Crane kaplan pocket marker.



Fig.:- Kirkland knife.

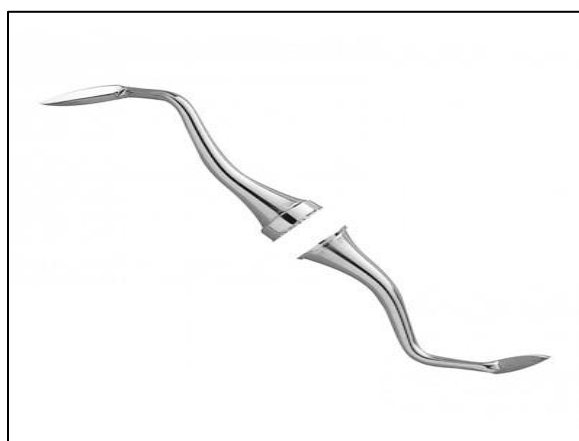


Fig.:- Orban knife.

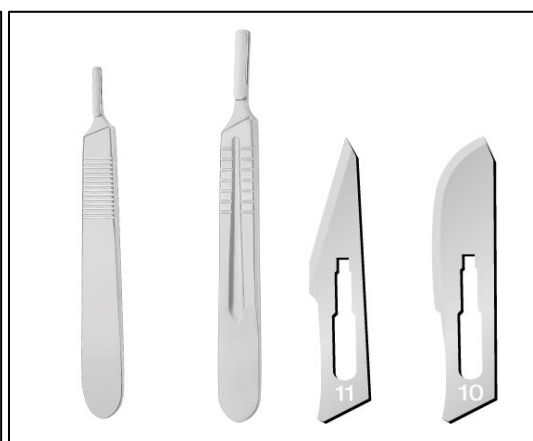


Fig.:- Surgical scalpels and blades.

Goldman gingivectomy procedure

- ☒ Giving local anesthesia
- ☒ **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.
- ☒ **Primary beveled incision (External beveled incision)** which carried out **1 mm** apical to bleeding points by **Kirkland knife**. Continuous incision or interrupted , straight or scalloped is made.
- ☒ **Secondary incision** to separate the interproximal soft tissues from the interdental periodontium by **Orban knife**.
- ☒ Careful removal of the incised tissues by a **currete or a cumine**. Curette remove plaque, calculus and granulation tissues then smoothing teeth surfaces.
- ☒ Use **Kirkland knife for gingivoplasty** (minor alterations in gingival morphology without tissue excision)by shaving wound margin to **create thin margin**.
- ☒ **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

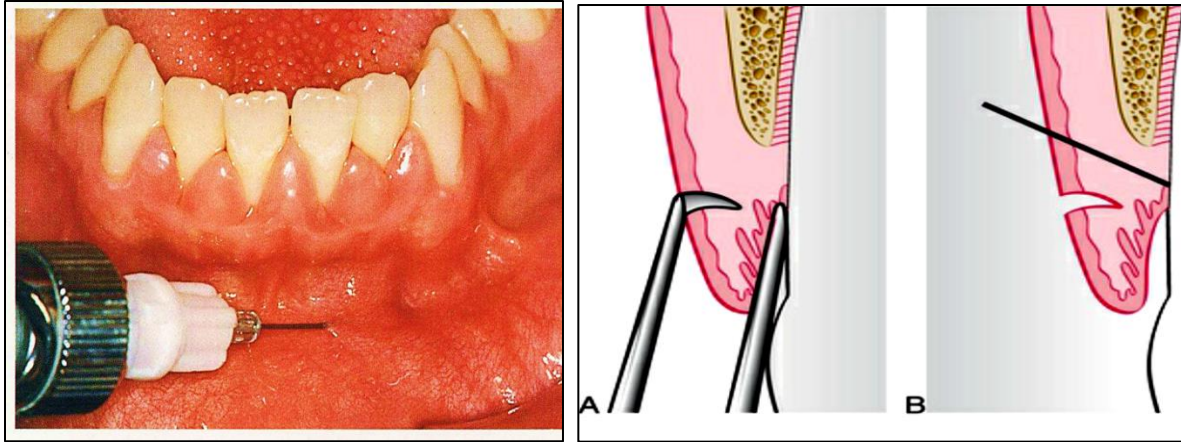


Fig.:- Pocket depth marker.

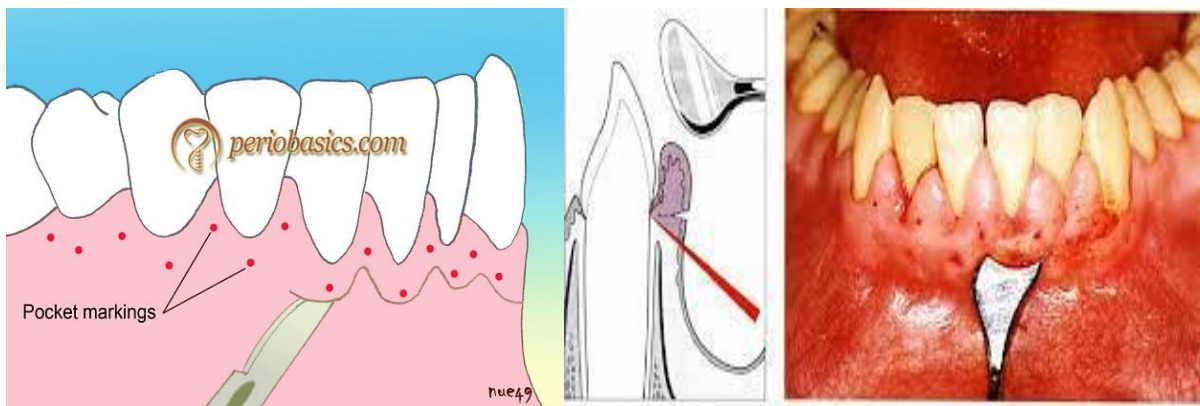


Fig.:- Primary beveled incision which carried out 1 mm apical to bleeding points by Kirkland knife or scalpel.

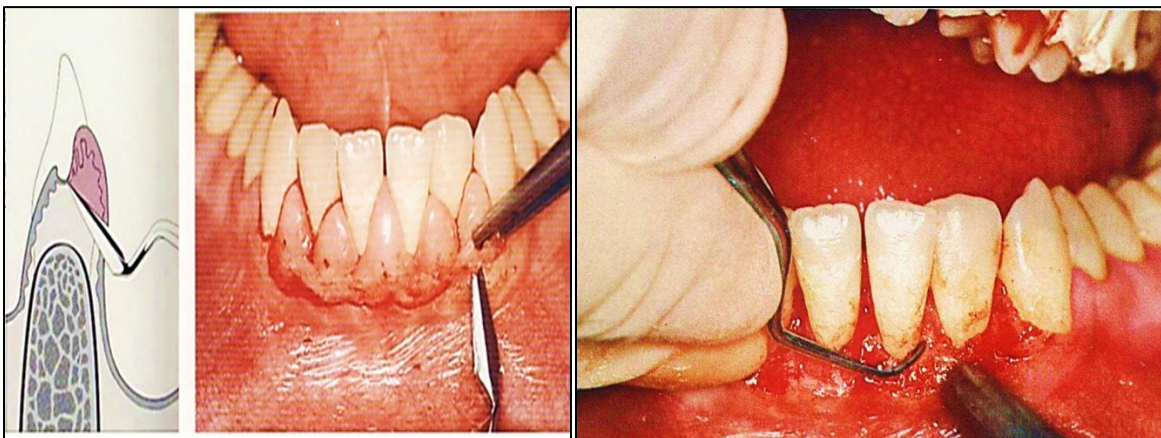


Fig.:- Secondary incision done by Orban knife & the incised tissues removed by a curette or cumine.

Gingivoplasty : Is recontouring the gingiva in the absence of pockets. It may be accomplished with a periodontal knife, a scalpel, or rotary coarse diamond stones.

Gingival Curettage: Describe the scraping of the gingival wall of a periodontal pocket to remove the chronically inflamed tissue. It is a definitive subgingival curettage procedure that is performed with a knife. Historically, it was thought this tissue hinders healing and new attachment, which necessitate gingival curettage. However, when the root is thoroughly scaled and planed, and the biofilm and calculus are removed, the inflammation in the tissue automatically resolves without tissue curettage. Therefore, the use of curettage to eliminate the inflamed granulation tissue is unnecessary. It has been shown that scaling and root planing with additional curettage do not improve the condition of the periodontal tissues beyond the improvement that results from scaling and root planing alone.

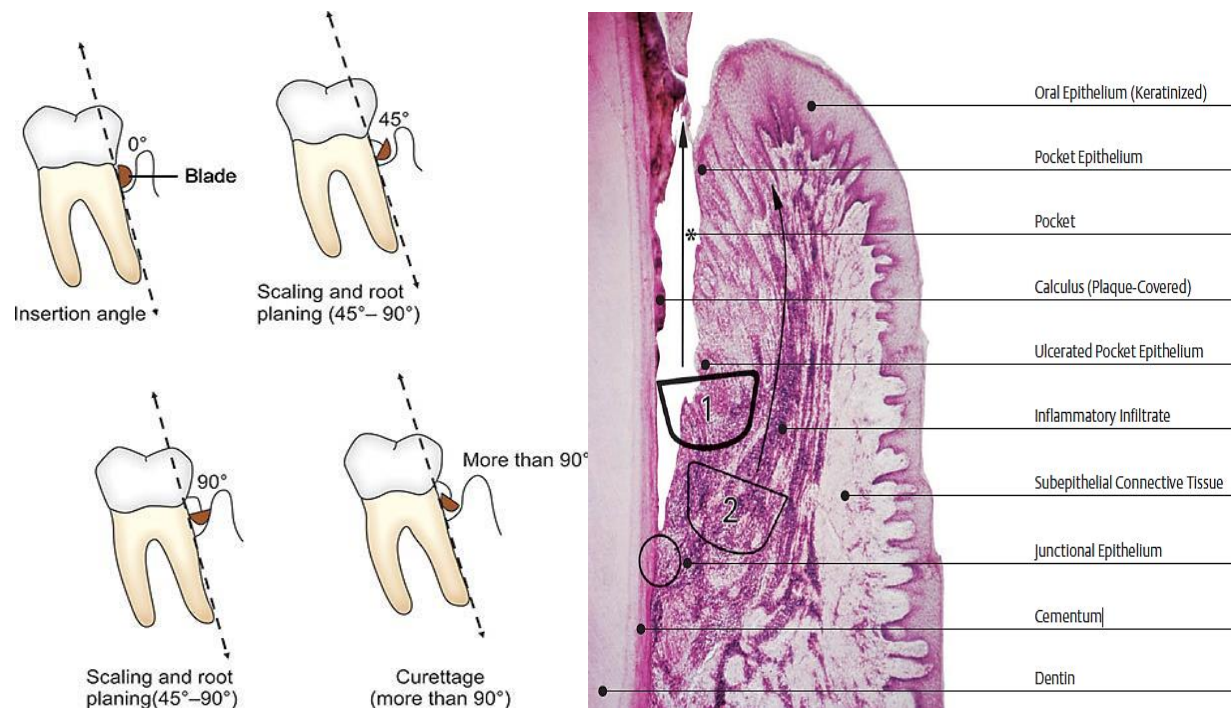


Fig:- Gingival curettage.

Periodontal dressing

Periodontal dressing: are mainly used :

- 1-To protect the wound post surgically
- 2-To obtain and maintain a close adaptation of the mucosal flaps to the underlying bone (especially when a flap has been repositioned apically)
- 3-For the comfort of the patient
- 4-Prevent post-operative bleeding during the initial phase of healing
- 5-Prevent the formation of excessive granulation tissue

Periodontal dressing should have the following properties:

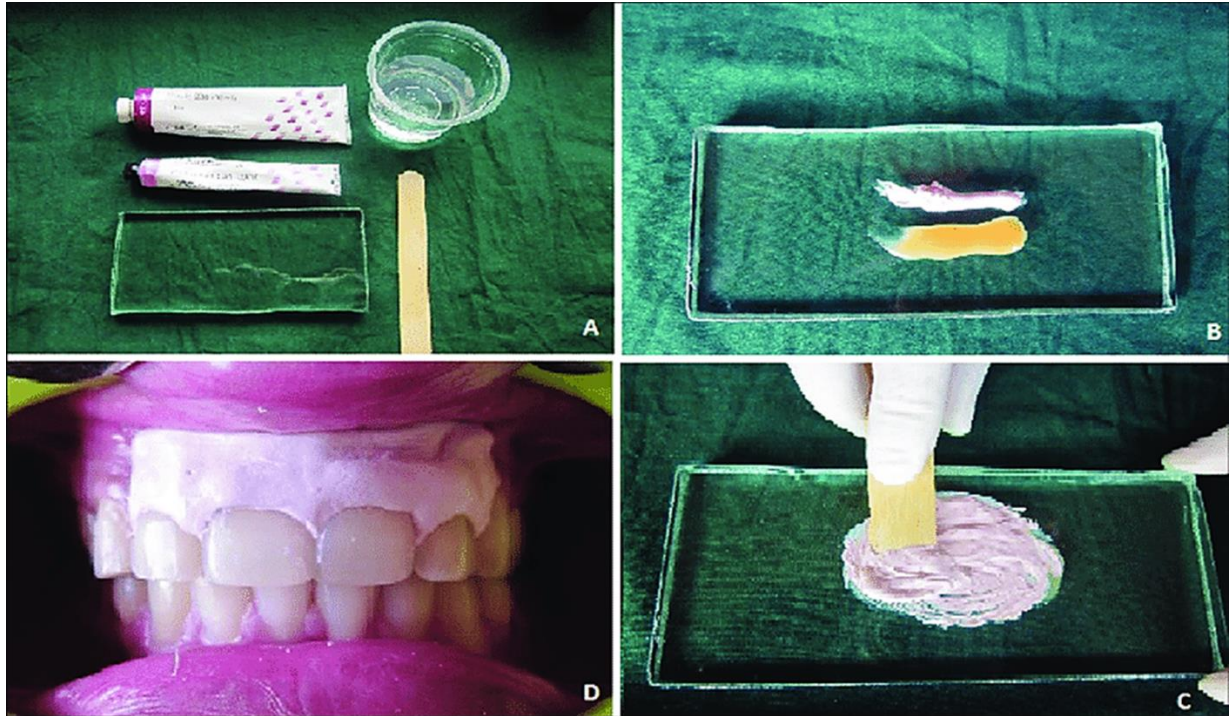
- 1-Should be soft but still have enough plasticity and flexibility to facilitate its placement in the operated area and to allow proper adaptation.
- 2-Should harden within a reasonable time
- 3-After setting should be sufficiently rigid to prevent fracture and dislocation.
- 4-Should have a smooth surface after setting to prevent irritation to the cheek and lips
- 5-Should preferably have bactericidal properties to prevent excessive plaque formation
- 6-Not detrimentally interfere with healing

Types of dressing

1-Zinc-oxide eugenol pack: eugenol in this type may induce an allergic reaction

2-Non eugenol pack: e.g. Coe pack; one tube contain zinc oxide and chlorothidol (Fungicidal) and the second tube contain non ionizing carboxylic acids and chlorothymol (bacteriostatic agent)

3-Light cured dressing



Retention of Dressing

Periodontal dressings are usually kept in place **mechanically by interlocking the dressing in interdental spaces** and joining the lingual and facial portions of the dressing. In isolated teeth or when several teeth in an arch are missing, retention of the dressing may be difficult. The placement of dental floss tied loosely around the teeth enhances the retention of the dressing.

Allergy

Contact allergies to eugenol and rosin have been reported.

Antibacterial Properties of Dressing

Improved healing and patient comfort with less odor and taste have been obtained by incorporating antibiotics into the dressing. **Bacitracin, oxytetracycline (Terramycin), tetracycline, neomycin, and nitrofurazone** have been used.

Care must be taken when any antibiotic products are used because they may produce hypersensitivity reactions. The emergence of resistant organisms and opportunistic infections has been reported. The **incorporation of tetracycline powder into the Coe-Pak** is generally recommended, particularly when long and traumatic surgical procedures are performed.

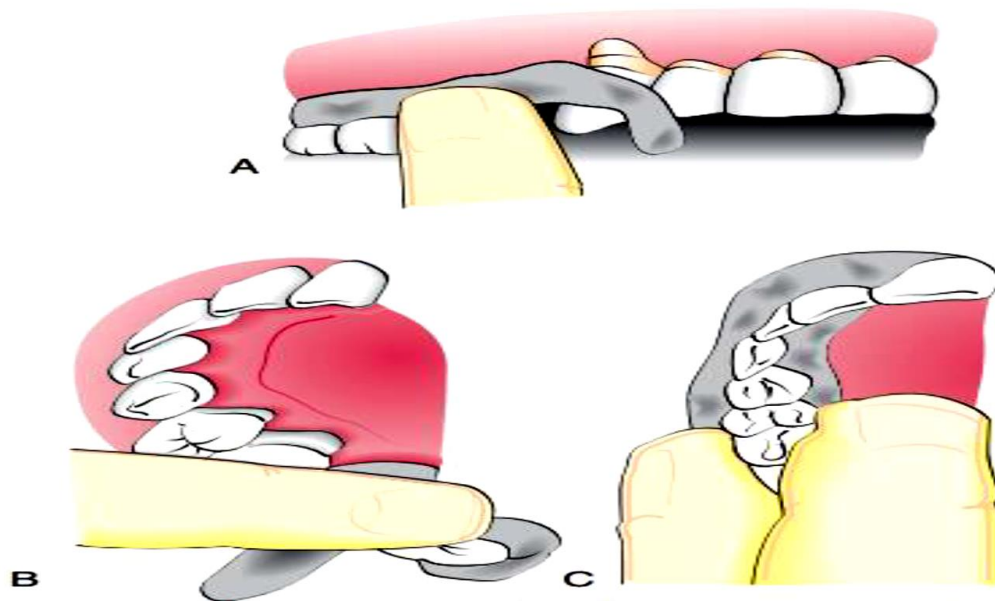


Fig. 59.2 Inserting the periodontal pack. (A) A strip of pack is hooked around the last molar and pressed into place anteriorly. (B) The lingual pack is joined to the facial strip at the distal surface of the last molar and fitted into place anteriorly. (C) Gentle pressure on the facial and lingual surfaces joins the pack interproximally.

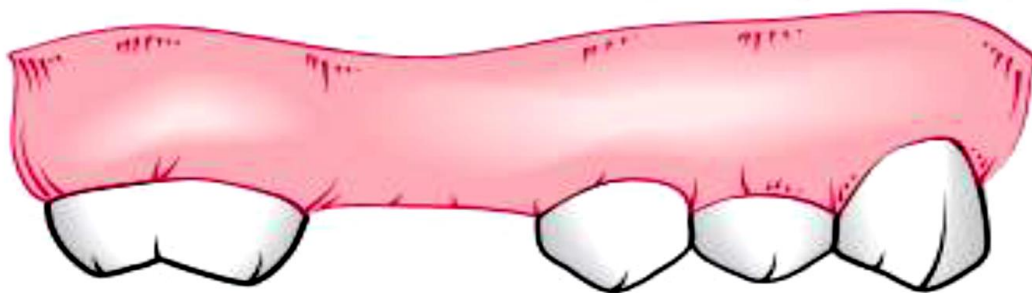


Fig. 59.3 Continuous pack covers the edentulous space.

Postoperative Instructions

Postoperative Instructions: The typical postoperative instructions should be given to the responsible adult, and the patient should be scheduled for a postoperative visit in 1 week. with a clear view of the surgical site.

Typically, the control of intraoperative bleeding can be managed with:-

- 1. Aspiration:-** Continuous suctioning of the surgical site with an aspirator.
- 2.** The application of pressure to the surgical wound with moist gauze can be a helpful adjunct to control site-specific bleeding.
- 3.** A suture can then be passed through the tissue and tied to restrict blood flow.
- 4.** Minor areas of persistent bleeding from capillaries can be stopped by applying cold pressure to the site with moist gauze for several minutes.
- 5.** The use of a local anesthetic with a vasoconstrictor (epinephrine) may also be useful for controlling minor bleeding . Both of these methods act through vasoconstriction, thereby reducing the flow of blood . This action is relatively short lived, and it should not be relied on for long-term hemostasis.

It is **important to avoid** the use of vasoconstrictors to control bleeding before sending a patient home. When the patient is dismissed from the appointment and the effect of the vasoconstriction is no longer present, bleeding can occur during the patient's trip home. For a slow, constant blood flow and oozing, hemostasis may be achieved with **hemostatic agent , Absorbable gelatin sponge**. Finally, it is imperative to recognize that excessive bleeding may be caused by systemic disorders, including (but not limited to) platelet deficiencies, coagulation defects, medications, and hypertension. As a precaution, all surgical patients should be asked about any current medications that may contribute to bleeding, any family

history of bleeding disorders, and hypertension. All patients, regardless of health history, should have their blood pressure evaluated before surgery, and anyone who is diagnosed with hypertension must be advised to see a physician before surgery. Patients with known or suspected bleeding deficiencies or disorders must be carefully evaluated before any surgical procedure. A consultation with the patient's physician is recommended, and laboratory tests should be performed to assess the risk of bleeding. It may be necessary to refer the patient to a hematologist for a comprehensive workup.

First Postoperative Week

Patients should be instructed to rinse with 0.12% chlorhexidine gluconate immediately after the surgical procedure and twice daily thereafter until normal biofilm control can be resumed.

The following complications may arise during the first postoperative week:

1. Persistent bleeding after surgery:- The dressing is removed, and local anaesthesia may be needed before the bleeding areas are located. The bleeding is stopped with pressure, or if necessary the area may have to be anesthetized and resutured. After the bleeding has been stopped, the area is again redressed.

2. Sensitivity to percussion:- Extension of inflammation into the periodontal ligament may cause sensitivity to percussion. The dressing should be removed and the surgical area checked for localized areas of infection or irritation. The area should be irrigated or incised to provide drainage if areas of localized exudate are present. Particles of calculus that may have been overlooked should be removed. Relieving the occlusion can be helpful. Sensitivity to percussion may also be caused by excess dressing, which interferes with the occlusion. Removal of the excess usually corrects the condition.

3. Swelling:- During the first 2 postoperative days, some patients may report a soft, painless swelling of the cheek in the surgical area. Lymph node enlargement may occur, and the temperature may be slightly elevated. The area of operation itself is usually symptom-free. This type of involvement results from a **localized inflammatory reaction to the surgical procedure**. It generally subsides by the **fourth postoperative day** without necessitating the removal of the dressing. If swelling persists, enlarges, or is associated with increased pain, amoxicillin (500 mg) should be taken every 8 hours for 1 week. The patient should also be instructed to apply moist heat intermittently over the area.

4. Feeling of weakness:- Occasionally, patients report having weakened feeling for about 24 hours after surgery. This represents a systemic reaction to transient bacteremia induced by the procedure. This reaction can be prevented by premedication with amoxicillin (500 mg) every 8 hours. **This protocol should be started 24 hours before the next procedure and continued for 5 days postoperatively.**

Removal of the Dressing and Return Visit

When the patient returns in 1 week, the periodontal dressing is removed by inserting a curette along the margin and exerting gentle lateral pressure. Pieces of the dressing retained interproximally and particles adhering to the tooth surfaces are also removed with curettes. Particles of dressing and debris may be enmeshed in the surgical surfaces and should be carefully removed with cotton pliers. The entire area is irrigated with peroxide to remove the superficial debris.

Findings at the Time of Dressing Removal

The following are the usual findings when the dressing is removed:

- If gingivectomy has been performed, the incised surface is covered with a **friable meshwork of new epithelium**. This tissue **should not be disturbed**. If calculus has not been completely removed, red, beadlike protuberances of granulation tissue will persist. The granulation tissue must be removed with a curette to expose the calculus so the root can be planed.
- The facial and lingual mucosa may be covered with a greyish-yellow or white granular layer of debris that has entered under the dressing. This is easily removed with a moist cotton pellet. The root surfaces may be sensitive to touch or thermal change. The patient should be assured that these changes will disappear with time (**4 to 6 weeks**). The dentition that was beneath the dressing may be stained in a brownish-yellow color that can be removed by polishing at a later date.
- Fragments of calculus delay healing. Each root surface should be carefully rechecked visually to be certain that no calculus was missed during surgery. The grooves on the proximal root surfaces and the furcations are areas where calculus is likely to be overlooked.

Redressing

After the dressing is removed, it is usually not necessary to replace it. However, redressing for an additional week is advised for the following types of patients:

- (1) Those with a low pain threshold who are particularly uncomfortable when the dressing is removed.
- (2) Those with unusually sensitive root surfaces post-surgically.

(3) Those with an open wound. Periodontal dressings assist healing by protecting the tissue through prevention of surface trauma during mastication and protect the patient from pain induced by contact of the wound with food or with the tongue during mastication

Tooth Mobility

Tooth mobility usually increases immediately after surgery. This results from edema in the periodontal ligament space from the inflammation that occurs post surgically. The mobility diminishes to the pretreatment level by the fourth week. The patient should be reassured before surgery that the mobility is temporary.

Mouth care between procedures

1. Because the areas are still healing and uncomfortable. **Vigorous brushing is not feasible** during the first week after the dressing is removed. However, the patient is advised to try to keep the area as clean as possible with the **gentle use of a soft toothbrush** and light water irrigation.
2. Rinsing with a chlorhexidine mouthwash or applying such a rinse topically with cotton-tipped applicators is indicated for the first few postoperative weeks.
3. Brushing is introduced when the healing of the tissues permits, and the overall hygiene regimen is increased as healing progresses.

Patients should be told that (1) some gingival bleeding will occur when the wounded areas are gently cleaned; (2) this bleeding is normal and will subside as healing progresses; and (3) the bleeding should not deter them from following their oral hygiene regimen.

Management of Postoperative Pain

Periodontal surgery produces only minimal pain and discomfort. a common source of postoperative pain is an overextension of the periodontal dressing onto the soft tissue apical to the mucogingival junction or onto the frenal. Overextended dressings cause localized areas of edema that are usually noticed 1 to 2 days after surgery. The removal of excess dressing is followed by a resolution in about 24 hours. Extensive and excessively prolonged exposure of bone with poor irrigation during surgery induces greater pain. For most healthy patients, a preoperative dose of **ibuprofen (600 to 800 mg)** followed by **one tablet every 8 hours for 24 to 48 hours** is very effective for reducing discomfort after periodontal surgery. Caution should be used when prescribing or dispensing ibuprofen to patients with hypertension that is controlled by medications because it can interfere with the effectiveness of the medication. Patients experiencing severe postoperative pain should be seen on an emergency basis. The area should be anaesthetized by infiltration, and the dressing should be removed to allow for the

examination of the area in pain. Postoperative pain related to infection is accompanied by localized lymphadenopathy and a slight elevation in temperature. This type of pain should be treated with systemic antibiotics and analgesics.

Dentin (Root) Hypersensitivity

Dentin or root hypersensitivity is a relatively common problem in periodontal practice. It may occur spontaneously when the root becomes exposed as a result of gingival recession or pocket formation, or it may appear after scaling and root planing and other periodontal surgical procedures. The root sensitivity management must be performed.

Maintenance phase (supportive periodontal therapy SPT)

Preservation of the periodontal health of the treated patient requires a supportive program that is just as important as the therapy used to treat the periodontal disease. The maintenance phase of periodontal treatment starts immediately after the completion of phase I therapy. While the patient is in the maintenance phase, the necessary surgical and restorative procedure are performed. This insures that all areas of the mouth retain the degree of health attained after phase I therapy.

The primary goal of maintenance therapy include

- 1. Maintenance of oral health (cancer screening)**
- 2. Prevention of new infection**
- 3. Prevention of re-infection and disease recurrence**

The time interval between the recall appointments should be based on a periodontal risk assessment(type and severity of periodontitis, systemic and local risk factors, degree of motivation, compliance, manual dexterity and the patient success to maintain a proper personal oral hygiene standard). It is important to emphasize that the recall program must be designed to meet the individual need of the patient, some patients should be recall every month while other may have to be checked only once a year. **Findings From long-term clinical trials have suggested that recall appointments, once every three month is effective in preventing disease recurrence.**

There are three parts in SPT appointment:

- 1.Examination**
- 2.Treatment**
- 3.Report,clean up and scheduling**

The time required for a recall visit for patients with multiple teeth in both arches is approximately 1 hour.

Part I: Examination

(Approximate time: 14 minutes)

Patient greeting
Medical history changes
Oral pathologic examination
Oral hygiene status
Gingival changes
Pocket depth changes
Mobility changes
Occlusal changes
Dental caries
Restorative, prosthetic, and implant status

Part II: Treatment

(Approximate time: 36 minutes)

Oral hygiene reinforcement
Scaling
Polishing
Chemical irrigation or site-specific antimicrobial placement

Part III: Report, Cleanup, and Scheduling

(Approximate time: 10 minutes)

Write report in chart.
Discuss report with patient.
Clean and disinfect operator.
Schedule next recall visit.
Schedule further periodontal treatment.
Schedule or refer for restorative or prosthetic treatment.

Recurrence of Periodontal Disease

Occasionally, lesions may recur, which is often due to inadequate plaque/biofilm control on the part of the patient or failure to comply with recommended SPT schedules. It should be understood, however, that it is the responsibility of the dentist to educate and motivate patients to improve their oral hygiene techniques. Surgery should not be undertaken unless the patient participates in disease prevention and demonstrates proficiency in plaque/biofilm control.

Other causes for recurrence include the following:

1. Inadequate or insufficient treatment that has failed to remove all of the potential factors favoring biofilm accumulation. Incomplete calculus removal in areas of difficult access is a common source of problems.
2. Inadequate restorations placed after the periodontal treatment was completed.
3. Failure of the patient to return for periodic maintenance care .
4. Presence of some systemic diseases that may affect host resistance to previously acceptable levels of biofilm.

A failing case can be recognized by the following:

1. Recurring inflammation revealed by gingival changes and bleeding of the sulcus on probing.
2. Increasing depth of sulci, leading to the recurrence of pocket formation.
3. Gradual increases in bone loss, as determined by radiographs.
4. Gradual increases in tooth mobility, as ascertained by clinical examination.

The decision to retreat a periodontal patient **should not be made** at the preventive maintenance appointment but should be postponed for 1 to 2 weeks. Often, the mouth appears improved at that time because of the resolution of edema and the resulting improved tone of the gingiva.