JSS ACADEMY OF HIGHER EDUCATION & RESEARCH
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Topic:

General Principles of Periodontal Surgery

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General Principles of Periodontal Surgery

All surgical procedures should be very carefully planned. The patient should be adequately prepared medically, psychologically, and practically for all aspects of the intervention. It includes:

A. Preparation of the patient

B. The general conditions that are common to all periodontal surgical techniques and,

C. Complications that may occur during or after surgery.

A.Preparation of the Patient

Reevaluation after Phase I Therapy

Almost every patient has to undergo the initial or preparatory phase of therapy. (scaling + root planning and removal of etiotropic elements) because it:

- Eliminates some lesions completely.
- Renders the tissues more firm and consistent, thus facilitating more accurate and delicate surgery and,
- Acquaints the patients with the office and with the operator and assistants, thereby reducing the patient's apprehension and fear.

- The re-evaluation phase consists of re-probing and re-examining all the findings that previously indicated the need for the surgical procedure. Persistence of these findings will confirm the indication for surgery

Informed Consent.

The patient should be informed at the time of the initial visit about the diagnosis, prognosis, the different possible treatments with their expected results, and all pros and cons of each approach.

At the time of surgery, the patient should again be informed, verbally and in writing, of the procedure to be performed, and he or she should indicate agreement by signing the consent form.

Emergency Equipment

The operator, all assistants, and office personnel should be trained to handle all the possible emergencies that may arise. Drugs and equipment for emergency use should be readily available at all times.

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B.General Conditions that are Common to All Procedures

Measures to Prevent Transmission of Infection

All the measures should be taken to prevent the transmission of infections. These include the use of disposable gloves, surgical masks and protective eye wear.

All surfaces that may be contaminated with blood or saliva and cannot be sterilized, must be covered with aluminium foil/plastic wrap. Ultrasonic scaling is contraindicated in patients with infectious diseases, as it generates aerosols and special care should be taken while using it (Pre-procedural mouth rinsing).

PREMEDICATION:

Premedication should be given when indicated. The chemotherapeutic agents used for premedications are:

i. *Anxiolytics*: Apprehensive and neurotic patients are given antianxiety, sedative, hypnotic agents, tranquilizers or barbiturates im or iv prior to surgical therapy.

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ii. *Antibiotics*: Given to only medically compromised patients such as infective endocarditis or patients who require prophylactic antibiotics regimen (valvular heart disease). Antibiotics should be given one hour before surgery to attain adequate levels so as to prevent bacteremia and 4-7 days after the surgery.

iii. *Antiseptics*: Oral rinse with 0.12% CHX gluconate mouthwash.

iv. *Nonsteroidal Anti-inflammatory drugs (NSAIDs)*: Ibuprofen can be given as premedication before surgery.

SEDATION AND ANESTHESIA

In order to prevent pain during the surgery, the entire area to be treated should be thoroughly anesthetized by means of a regional block and local infiltration. Patients who are apprehensive and neurotic may require special management with agents like sedatives and anti-anxiety drugs. Modalities for the administration of these agents include inhalation, oral, intramuscular, and intravenous routes.

For individuals with mild to moderate anxiety, oral administration of a benzodiazepine can be effective in decreasing anxiety and producing a level of relaxation. Oral administration of a sedative agent can be more effective than inhalation anesthesia because the level of sedation achieved may be more profound. Disadvantages of oral sedative administration include incomplete recovery. **For individuals with moderate to severe levels of anxiety**.Intravenous (IV) administration of a benzodiazepine,alone or in combination with other agents, can be used to achieve a greater level of sedation.

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Medical history

The operator should determine if specific preoperative modifications are indicated because of patient's medical history, well before scheduling any surgical procedure. Drug allergy, patient's medication or systemic disease dictate alterations in the type of anesthetic agent, analgesics, prophylactic antibiotic and even surgical procedure

Tissue Management

1. Operate gently and carefully: In addition to being most considerate to the patient, tissue manipulation should be precise, deliberate, and gentle because it produces excessive tissue injury; causes postoperative discomfort and delays healing.

2. Observe the patient at all times-facial expressions, pallor to know if the patient is going through pain.

3. Be certain the instruments are sharp: Dull instruments will cause unnecessary trauma and poor cutting because of excess force usually applied to compensate for their ineffectiveness.

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Scaling and Root Planing

Scaling and root planing in conjunction with periodontal surgery is done on exposed root surfaces with the help of curettes.

Hemostasis

Steps to minimize postsurgical bleeding:

1. Before approximation of flaps, all areas should be rinsed free of clots and the surgical site should be checked again for bleeding.

2. Pressure should be applied to the flap to encourage minimal clot thickness.

3. Good closure with suturing discourages postsurgical hemorrhage.

4. Distal wedge and edentulous ridge sites should be well approximated carefully with attention because these areas are good source of postoperative bleeding.

For slow, constant blood flow and oozing, hemostasis may be achieved with hemostatic agents such as: Absorbable gelatin sponge (Gelfoam), oxydized cellulose (Oxycel), oxidized regenerated

cellulose (Surgicel Absorbable Hemostat), and microfibrillar collagen hemostat(Collacote, Collatape, Collaplug)and *Thrombin* are useful hemostatic agents for the control of capillaries, small blood vessels, and deep wound bleeding.

Indications for Periodontal Surgery

- Correction of gross gingival aberrations.

  Persistent inflammation in areas with moderate to deep pockets.
  - Areas with irregularly bony contours, deep craters.
  - When removal of root irritant is not possible due to deep pockets especially in molars and premolars.
- Furcation lesions.
  - Infrabony pockets on the distal areas of last molars, complicated by mucogingival problems.

Contraindications for Periodontal Surgery

1. Uncooperative patient

a. Uncontrolled systemic diseases/hormonal disorders

b. Uncontrolled diabetes mellitus

c. Adrenal dysfunction

2. Blood disorders

3. Smoking

4. Cardiovascular diseases-

- Hypertension
- Myocardial infarction
- Angina pectoris
- Anticoagulant therapy
- Rheumatic fever

5. Organ transplantation

7. Neurological disorders

- Multiple sclerosis
- Parkinson's disease

Consent:

Patient should be fully informed verbally and in writing about the details of the procedure and possible

complications. Patient should given agreement for the procedure both with an oral statement and by signing a consent form.

Premedications:

Premedication should be given when indicated. The chemotherapeutic agents used for premedications are:

	Premedications	
1	Anxiolytics:	Apprehensive and neurotic patients are given antianxiety, sedative, hypnotic agents, tranquilizers or barbiturates IM or IV prior to surgical therapy

2	Antibiotics:	a. Antibiotics should be given one hour before surgery to attain adequate levels so as to prevent bacteremia. b. Given to only medically compromised patients such as infective endocarditis or patients who require prophylactic antibiotics regimen (valvular heart disease).
3	Antiseptics:	a. Oral rinse with 0.12% CHX gluconate mouthwash.
4	Nonsteroidal Anti-inflammatory drugs	Eg: Ibuprofen can be given as premedication before surgery.

	(NSAIDs):	

Note: Patients on anticoagulant therapy/aspirin should stop such medicines 7 to 14 days before surgery and 3 to 4 days afterwards with physician's approval.

INTRAOPERATIVE CONSIDERATIONS

Monitoring Pre-Surgical Data

The data necessary to select the surgical procedure includes periapical radiographs (IOPARs), study casts and probing charts.

Local Anesthesia:

Periodontal surgery should be performed painlessly, the entire area of the dentition scheduled for surgery, the teeth as well as periodontal tissues should be anesthetized by proper anesthesia. Local infiltration and block anesthesia are

the methods of choice. After the initial administration of local anesthesia, inject a drop of anesthetic solution directly into interdental papilla. It makes the gingiva firmer and easier to incise and has a hemostatic effect because of the vasoconstrictor present in the solution. In general, most periodontal surgical procedures are done under local anesthesia. However, in apprehensive patients or patients suffering from neurological disorders, surgery is done under general anesthesia (V. rarely)

NOTE:

- Use suction during surgery
- avoid compression of tissues with dry sponge. Cotton fibers of dry sponge/ gauze could be left behind and may be source of future irritation and infection.
- Sterile saline solution should be used.
- Do not blow air into the surgical site as it may induce cervicofacial emphysema which can be fatal.

- Slow-speed sharp surgical bur and adequate cooling should be used for bone removal. Avoid undue drying of the bone and do not heat the bone above 47°C otherwise it will cause necrosis of bone surface.

- Avoid heavy pressure against the soft tissues/bone

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Hemostatic agents used:

The various topical hemostatic agents are	
Agent	***Main constituent***
Avitene	Collagen
Collacote	Collagen
Collatape	Collagen
Collaplug	Collagen
Thrombinar	Thrombin
Thrombogen	Thrombin
Thrombostat	Thrombin
Gelfoam	Gelatin

Beriplast	Fibrin
Surgicel	Cellulose

Wound Closure:

The various techniques of wound closure are sutures, skin clips/staples, skin tapes and wound adhesive [Autologous fibrin glue, fibrin fibronectin sealing system (Tissucol), Cyanoacrylate, Mussel adhesive protein].

The various intraoral anchoring structures useful in securing movable tissues are:

i. *Teeth*: These teeth are easiest and most secure of all intraoral anchors.

ii. *Bound down tissue*: Gingiva affixed to bone via periosteum, is the second most reliable anchor.

iii. Periosteum.

iv.*Loose connective tissue*: It is the least secure anchoring structure in the mouth. Connective tissue in the

vestibule and fatty tissue in the retromolar area are the examples of loose connective tissue anchor source.

Suture and Suturing Techniques

Selection of the type of suture material and needle is dependent on tissue type and thickness, location in them mouth, ease of handling, cost and the planned time of suture removal.

Principles of suture removal:

i. Areas should be swabbed with hydrogen peroxide for removal of encrusted necrotic debris, blood and serum from suture.

ii. A sharp suture scissor should be used to cut the loops of suture, close to the epithelial surface as possible. In this way, a minimal amount of portion of sutures that was exposed to the outside environment and has become laden with debris and bacteria will be dragged through the tissue.

iii.A cotton plier is then used to remove the sutures. The location of knots should be noted so that they can be

removed first, which will prevent unnecessary entrapment of the flap.

Periodontal Dressings

Periodontal dressings were first introduced in 1923 when Dr AW Ward advocated the rules and use of packing material around the teeth following gingival surgery.

This material was called Wonder pack, which consisted of zinc oxide eugenol mixed with alcohol, pine oil and asbestos fibers.

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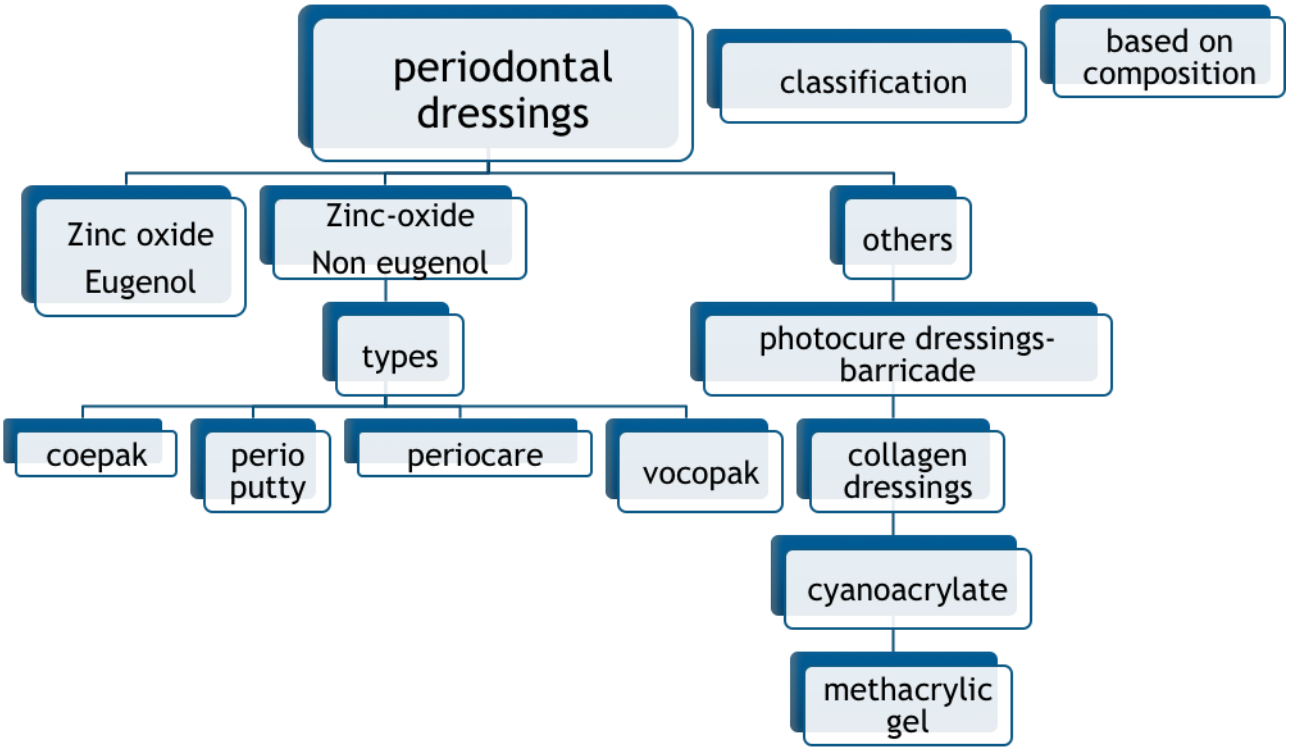
Classification of Periodontal Dressings:



General principles of periodontology

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Purpose

Periodontal dressings are used for the following reasons:

a. Protect the wound area from irritants such as hot/ spicy food.

b. Enhances patient comfort.

c. Helps to maintain the position of repositioned soft tissues and act as a template to prevent formation of excessive granulation tissue.

d. Also protects newly exposed root surfaces from temperature changes, stabilizes mobile teeth and protect sutures.

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Properties

a. Dressing should be soft, but with enough plasticity and flexibility.

b. Dressing should set within a reasonable time.

c. Dressing should have sufficient rigidity to prevent fracture and dislocation.

d. Dressing should have a smooth surface after setting to prevent irritation to the cheeks and lips.

e. Dressing should be dimensionally stable to prevent salivary leakage and accumulation of plaque debris.

f. Dressing should preferably have bactericidal properties to prevent excessive plaque formation.

g. Dressing should not induce allergic reactions.

h. Dressing should have an acceptable taste.

i. Dressing must not detrimentally interfere with healing

Zinc oxide eugenol dressings:

powder & liquid form (kirkland)

- POWDER-
  ZnO, tannic acid, rosin, kaolin, zinc steorate asbestos
- **LIQUID-**
  Eugenol, peanut oil, rosin
- setting occurs as a result of chemical interaction between Zn0 & Eugenol forming Zinc eugenolate

PASTE FORM

- **TUBE 1-B**ase-ZnO-87%, Fixed vegetable/mineral oil-13%,, mineral oil-13%
- **TUBE 2-**Accelerated-oil of clove-12%
  gum/polymerized rosin

Zinc oxide non-eugenol dressings:

i. *Coepak*: It is the most common and widely used non – eugenol dressing

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Coe-pak system

Composition of Coe-pak:

	Ingredient	Function
1	Zinc oxide	Main ingredient
2	Vegetable oil	For plasticity
3	Gum	For cohesiveness
4	Lorothidol	Fungicide
5	Liquid coconut	Fatty acids
6	Chlorothymol	Bacteriostatic agent

7	Colophony resin	

ii. ***Periocare*:** Paste contains-

zinc oxide

MgO

Ca(OH)2

vegetable oils

Gel contain resins, fatty acids, ethylcellulose, lanolin, Ca(OH)2.

The setting of periocare occurs by chemical reaction.

iii. ***Periopac*:**

It is premixed

ZnO

noneugenol dressing containing Ca3(PO4)2

ZnO

Acrylate

organic solvents

flavoring and coloring agents

When this material is exposed to air or moisture, it sets by the loss of organic solvents.

iv. ***Vocopac*:** It is a new formulated product for use as periodontal dressing

It contains

- 90 gm base
- 90 gm catalyst
- It contains neither eugenol nor coumarin
- causes no gingival irritation
- it retains its tough elastic qualities throughout its life in the patient's mouth, and does not become brittle
- It adheres excellently to the teeth and promotes healing.

Mixing time is about 20-30 seconds and its working time is approximately 10-15 minutes

v. *Perioputty*:

*I*t is a noneugenol dressing which contains

- methyl and propyl-parabens for their effective

- bacteriocidal and fungicide properties and benzocaine as a topical anesthetic.

vi. *Barricaid visible light cure periodontal dressing*:

This single component of periodontal dressing eliminates messy, time consuming mixing of paste. It is available in a syringe for the direct application or dispensing on a mixing pad and placement intraorally. Curing of the material is then accomplished with a visible light curing unit to form a nonbrittle, but firm, protective elastic covering. The principle ingredients of this material are polyether urethane dimethacrylate resin, silica, visible light cure (VLC) photoinitiator, accelerator and stabilizer. It contains polymerisable monomers which may cause skin sensitization (allergic contact dermatitis) in susceptible persons. Eye protection should be worn, while curing with a visible light unit.

vii. *Collagen dressings*:

An example of collagen dressing is collocate.

Collagen dressing is in the form of collagen sponge which is a type I collagen derived from bovine Achilles tendon. It is completely resorbable dressing that is used to cover and protect palatal graft sites; the sponge is approximately 3 mm thick and can be cut to fit the graft site. It stops bleeding and can absorb 30-40 times its weight in fluid, without swelling.

viii. *Methacrylate gel dressings*: They have elastic consistency that is soft and resilient and will flow under pressure. They adapt closely to the tissues and are very comfortable with wound site. The major advantage of this material is its ability to carry and release medicaments to the soft tissues.

ix.*Cyanoacrylate*: In 1964 tissue adhesives were introduced to dentistry. Dr SN Bhaskar conceive the idea of their potential use in periodontics and conducted the bulk of the laboratory and clinical research. The basic formula of Cyanoacrylate is CH=) – COOR. The butyl and isobutyl formsare ideal as periodontal dressings. The use of

cyanoacrylate is an alternative to suturing and as a surface adhesive and periodontal dressing. This material has the unique ability to cement together moist, living tissue surfaces. Cyanoacrylate is either applied in drops or sprayed on the tissues. The material is much less bulky than other dressings.

Other advantages include lack of apparent side effects, easy adherence to living tissues, immediate hemostasis, lack of evidence of systemic toxicity/ sensitivity, precise placement of flaps, decreased suturing time, ease of application and patient preference over bulky dressings. It is most useful in flap control in concave zones such as furcal area fluting. Cyanoacrylate has been used for surface application only; adhesives that become trapped under soft tissue flap will delay wound healing.

Antibacterial properties of packs:

Antibiotics that have been tried:

- Bacitracins,

- Oxytetracycline
- Neomycin
- Nitrofuraxone

Diadvantage:

- all may produce hypersensitivity reactions. Incorporation of tetracycline powder in
- Coe – Pak is generally recommended, particularly when long and traumatic surgeries are performed

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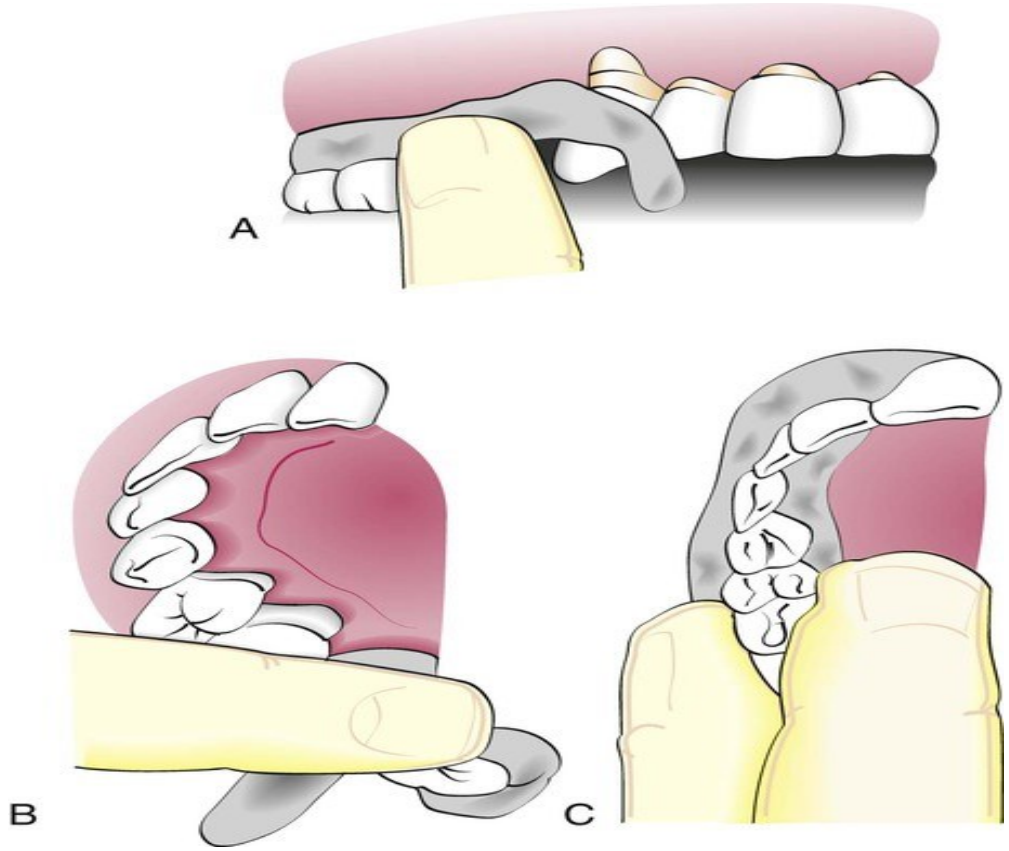
Preparation and Application of Periodontal Dressings

Zinc oxide packs are mixed with eugenol or non – eugenol liquids on a wax paper pad with a wooden tongue depressor. The powder is gradually incorporated with the liquid until a thick paste is formed. Coe-Pak is prepared by mixing equal lengths of paste from tubes containing the accelerator and the base until the resulting paste is of uniform color. The pack is thenplaced in a cup of water at room temperature, in 2-3 min the paste looses its tackiness and can be molded, and it remains workable for 15-20 min. The pack is then rolled into two strips of approximately the length of the treated area. The end of one strip is bend into a hook shape and fitted around the distal surface of the last tooth, approaching it from the distal surface. The remainder of the strip is brought forward along the facial surface tothe midline. The second strip is applied from the lingual surface. It is joined to the pack at the distal surface of the last tooth, and then brought forward along the gingival margin to the

midline. The strips are joined interproximally by applying gentle pressure on the facial and lingual surfaces of the pack

PLACEMENT OF PERIODONTAL PACK



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Periodontal pack replacement (CLINICAL PRESENTATION)

Do Nots:

- Periodontal dressing should not extend onto uninvolved mucosa.
- Should not extend over occlusal surfaces of teeth.
- Should not interfere with occlusion.

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Placement of Periodontal Dressings

Periodontal dressings are retained mechanically by interlocking in interdental spaces of teeth and joining the lingual and facial portions of the pack. In case of edentulous areas, the periodontal dressing is retained with the help of splints, hawley appliance and stents. In case of isolated teeth, tie dental floss or gauze loosely around the teeth and over which pack is applied. Periodontal dressing may entrap sutures beneath the dressing and may displace flap.

POSTOPERATIVE INSTRUCTIONS AND CARE

Appropriate postoperative instructions should be given both verbally and in written to the patient including an explanation concerning:

1. Discomfort and potential complications;
2. All medications, especially analgesics and antibiotics;
3. Diet modification

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Instructions to the Patient after Surgery

DO'S

- Little/no discomfort after anesthetic after it wears off
- Take 2 tablets of acetaminophen every 6 hours on first day.
- Chew on the non operated side
- Take semisolid food
- Avoid citrus foods
- For first 3 hrs, avoid hot liquids to permit pack to harden
- Pack to remain in place for a week until it is removed, this prevents pain, aids healing & enables, you to carry on most of your usual activites
- If pack chips off during the week, do not be concerned as long as you do not have pain
- If a piece of it breaks off, & you are in pain, call the office

- Apply ice, intermittently for alternating 20 minutes on and 20 minutes off, on the face over the operated side on the first day
- Use chlorhexidine mouthwash- donot rinse vigourously
- If the bleeding does not stop, take piece of gauge and form it into U-shape and hold it in thumb and index finger, apply it to both sides of the pack, and hold it there under pressure for 20 minutes
- Swelling is usual in extensive surgical procedure. It subsides in 3 or 4 days. Apply moist heat if it persists
- If any other problem arises do call the doctor.
- After pack is removed likely for it to bleed, which is normal in early stage of healing & will gradually subside

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Do Not's

× Avoid hot food

× Do not smoke or take alcohol

× Avoid citrus, highly spicy food

× Do not brush over the pack

× Avoid exertion/exercises

× Do not try to stop bleeding by rinsing.

Postsurgical Care

Day 1: Analgesics, cold packs, moist gauze locally as needed, total avoidance of wound disturbance After day 1: Pain, swelling, bleeding should diminish or disappear. Begin light activity, warm packs as needed and chemical plaque control are recommended. After 5 to 10 days: Remove dressing and sutures after 7 days: Professionally de-plaque supragingivally. Begin light oral hygiene.

After 4 to 6 weekly: Biweekly visits for professional deplaqing and oral hygiene instructions. The dentogingival junction should not be probed or instrumented for 6 to 8

weeks following surgery. Soft toothbrush should be used gently for the first few postoperative weeks. The patient should follow Charter's method avoiding vigorous toothbrushing.

POSTSURGICAL COMPLICATIONS

If postoperative complications occur, they should be managed by prompt and appropriate treatment, which may include control of bleeding, adequate analgesics or antibiotics.

Complications associated with periodontal surgery are:

- Hemorrhage
- Postoperative pain
- Infection
- Swelling
- Reaction to medications
- Other potential risks include root sensitivity, flap sloughing, root resorption or ankylosis, some loss of alveolar

crest, flap perforation, abscess formation and irregular gingival contours.

Hemorrhage

Primary postoperative hemorrhage starts at the time of surgery. Intermediate hemorrhage starts soon after the surgery, after having stopped temporarily following surgery. It is usually due to the breakdown of an incomplete clot, such as is associated with loss of the vasoconstrictor effect of anesthesia. Secondary hemorrhage starts from 24 hours to 10 days postoperatively.

Steps to control postsurgical bleeding:

1. First step to control bleeding is to identify the source of bleeding. Suction is done carefully and local pressure with gauze sponges is applied.

2. Judicious injection of vasoconstrictor combined with continuous application of pressure encourages clot formation

3. Artificial clot may be induced by use of an oxidized cellulose microfibrillar collagen product.

4. Electrocoagulation can be effective for capillary bleeding sites and small arterioles.

5. Large arteriole bleeding sites can be controlled by placing sutures in the soft tissue. Knot is drawn tight to occlude vessel by compression from the surrounding tissue

6. If bleeding is from intraosseous site then it can be controlled by bone wax (beeswax and salicylic acid) which occlude bony canals.

7. Excessive bleeding from interproximal and infrabony lesions results from inadequate degranulation. Residual granulomatous tissue is a common source of hemorrhage, since it is composed largely of capillaries

Postoperative Pain

The severity of postoperative pain varies depending on the patient threshold level, location, duration, extent of surgery and skill with which the soft and osseous tissue are handled during surgery. Postoperative pain and discomfort

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for the patient can be minimized by expert handling of the soft and osseous tissues atraumatically.

• The bone should be kept moist as dryness of bone induces severe pain. There should be complete soft tissu e coverage of the bone during suturing. Thus bone exposure should not be extensive.

• Periodontal dressing should not over extend beyond the mucogingival junction, or onto frenum and palate.

• Patient should be instructed to avoid chewing from the operated site.

• Two acetoaminophen tablets every 6 hours for the first 24 hours is prescribed for little pain or discomfort. But if pain persists then acetoaminophen plus codeine tablets can be prescribed.

• If the postoperative pain is related to infection which usually start after 4 days following surgery (localized

lymphadenopathy and fever), then it should be treated with systemic antibiotics along with analgesics.

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Swelling

Swelling after surgery is best prevented by the use of ice packs. After swelling develops, hot moist packs and frequent lavage with warm saline solution are preferred. It generally subsides by the 4th postoperative day. If swelling persists and becomes worse, then amoxicillin

(500 mg) should be taken every 8 hours for 1 week. No all postoperative swelling is caused by inflammation; some may be caused by bleeding into tissues. This may occur after flap operations and are accompanied by discoloration under cheek, chin or eye.

Treatment of sensitive roots:

- Relatively common problem in periodontal practice
- Occurs spontaneously when the root becomes exposed as a result of gingival recession or pocket formation, or may appear after surgical procedures

- Manifested as pain induced by cold or hot foods (more often cold) by citrus fruits, or sweets or by contact with a tooth brush or a dental instruments

CLASSIFICATION OF DESENSITIZING AGENTS

1. **Mode of administration**At home desensitizing agentsIn-office treatment
2. **Desensitize the nerve-** potassium nitrate
3. **Cover the dentinal tubules-**
    - Periodontal surgery/grafting
    - Composite/glass ionomer restoration
    - Crown placement
    - Plug (sclerose) the dentinal tubules-

i. Ions/salts-
- stannous fluoride
- sodium fluoride/stannous fluoride
- potassium oxalate
- ferrous oxide
- in combination with an adhesive

ii. precipitates-proteins/amino acids
- glutardehyde

iii. resins-
- dentin sealers
- methy methacrylate

4. **On the basis of mechanism of action**Nerve desensitization
    a. Potassium nitrate

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5. Protein precipitation
    a. Gluteraldehyde
    b. Silver nitrate
    c. Zinc chloride
    d. Strontium chloride hexahydrate
6. Plugging dentinal tubules
    a. Sodium fluoride
    b. Stannous fluoride
    c. Strontium chloride
    d. Potassium oxalate
    e. Calcium phosphate
    f. Calcium carbonate
    g. Bio active glasses (SiO_2–P_2O_5–CaO–Na_2O)
7. Dentine adhesive sealers
    a. Fluoride varnishes
    b. Oxalic acid and resin
    c. Glass ionomer cements
    d. Composites
    e. Dentin bonding agents
8. Lasers
    a. Neodymium:yttrium aluminum garnet (Nd-YAG) laser
    b. GaAlAs (galium-aluminium-arsenide laser)
    c. Erbium-YAG laser
9. Homeopathic medication
    a. Propolis

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WOUND HEALING

To ensure proper healing, atraumatic surgical principles should be followed including:

(1) adequate anesthesia;

(2) surface disinfection

(3) sharp instrumentation

(4) minimal, atraumatic tissue handling

(5) short operating time

(6) preventing unnecessary contamination

(7) proper suturing and dressing, if indicated.

Healing is a phase of the inflammatory response that leads to a new physiological and anatomical relationship among the disrupted body elements. Healing of periodontal tissue can be in the form of repair, new attachment and regeneration.

Healing rates of various periodontal tissues	
Tissue type	***Healing***

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	rate (Approximately)
Junctional epithelium	5 days
Sulcular epithelium	7-10 days
Gingival surface epithelium	10-14 days
Connective tissue	21-28 days
Alveolar bone	4-6 weeks

Gingival wounds heal much more rapidly with much less scar formation when compared to skin. The reason for this reduced scar formation are:

a. Gingival fibroblasts unlike the fibroblasts of other connective tissue produce more MMP13 than MMP1. MMP13 has a broad substantivity and is capable of break down/turnover of a number of extracellular matrix proteins. MMP1 on the other hand has a biological activity that is restricted to collagen I. The greater presence of MMP13 in

the wound area is thought to produce a greater turnover and thereby, prevent scar formation.

b. There is a greater presence of myofibroblasts in the gingiva when compared to skin. Fibroblasts can differentiate to form the more synthetic myofibroblasts under the influence of TGF-â. The presence of TGF-â in the wound area enhances the already greater presence of myofibroblasts thereby leading to lesser wound contraction and scarring.

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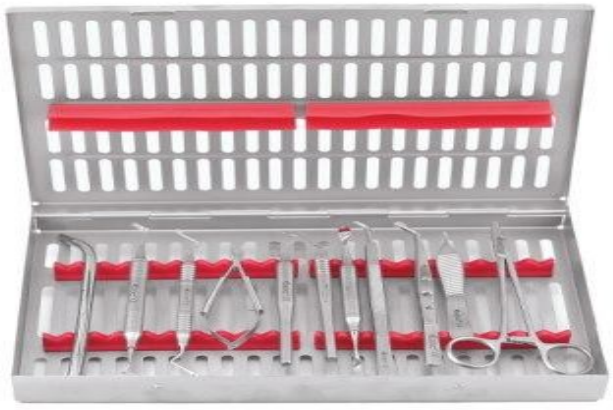
PERIODONTAL SURGICAL INSTRUMENTS



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Periodontal surgical instrumentation:

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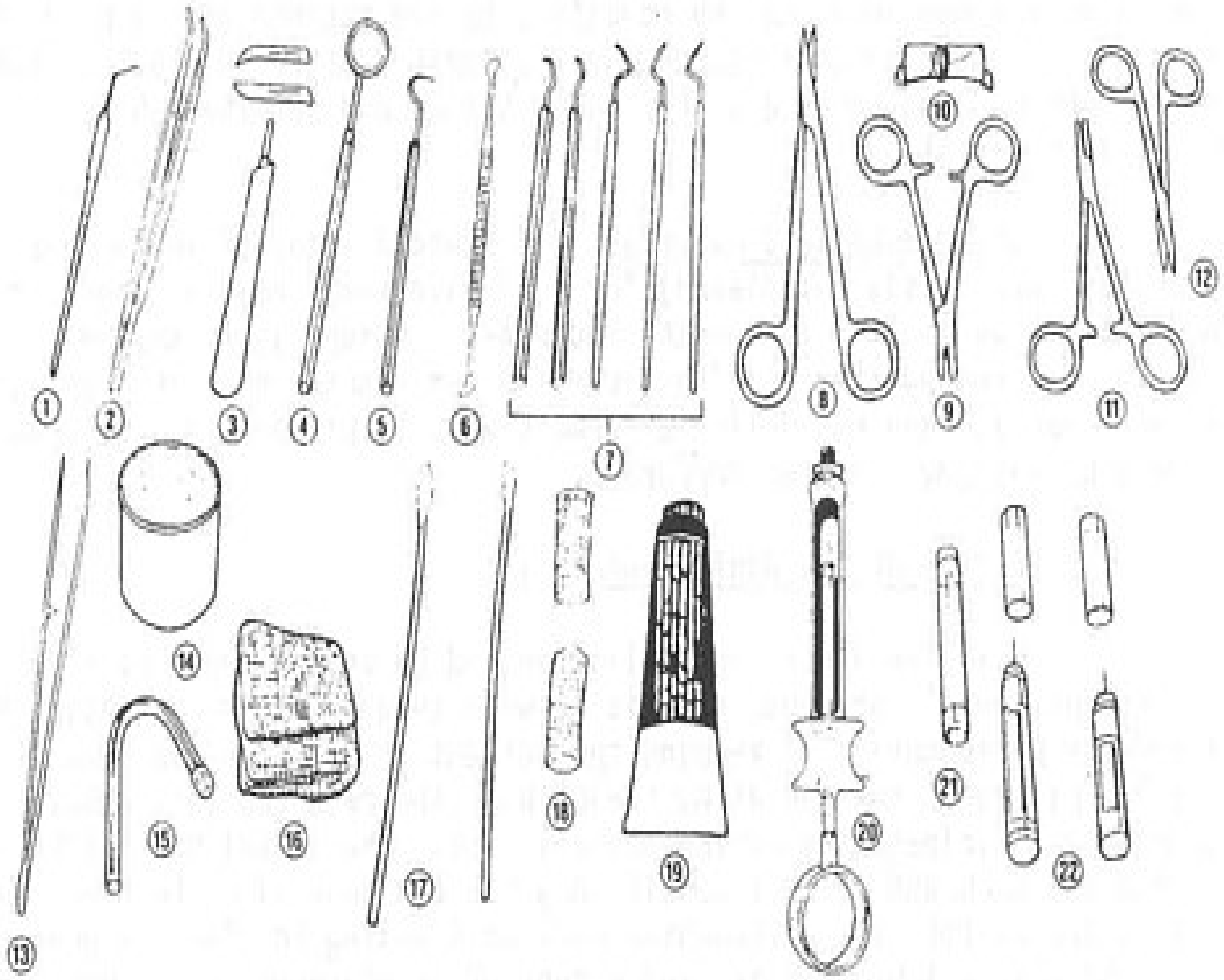

1. PERIODONTAL PROBE
2. PERIODONTAL POCKET MARKER
3. SURGICAL KNIFE HANDLE AND BLADES
4. MOUTH MIRROR
5. EXPLORER
6. PERIODONTAL KNIFE
7. PERIODONTAL SCALERS AND FILES
8. SURGICAL SCISSORS
9. SUTURE NEEDLE HOLDER
10. SUTURE NEEDLE AND SUTURE MATERIAL
11. HEMOSTAT
12. SUTURE SCISSORS
13. COTTON PLIERS
14. COTTON BALL DISPENSER
15. SALIVA EJECTOR
16. GAUZE
17. COTTON-TIP APPLICATORS
18. COTTON ROLLS
19. TOPICAL ANESTHETIC MATERIAL
20. ASPIRATING SYRINGE
21. CARTRIDGE OF ANESTHETIC SOLUTION
22. DISPOSABLE NEEDLES

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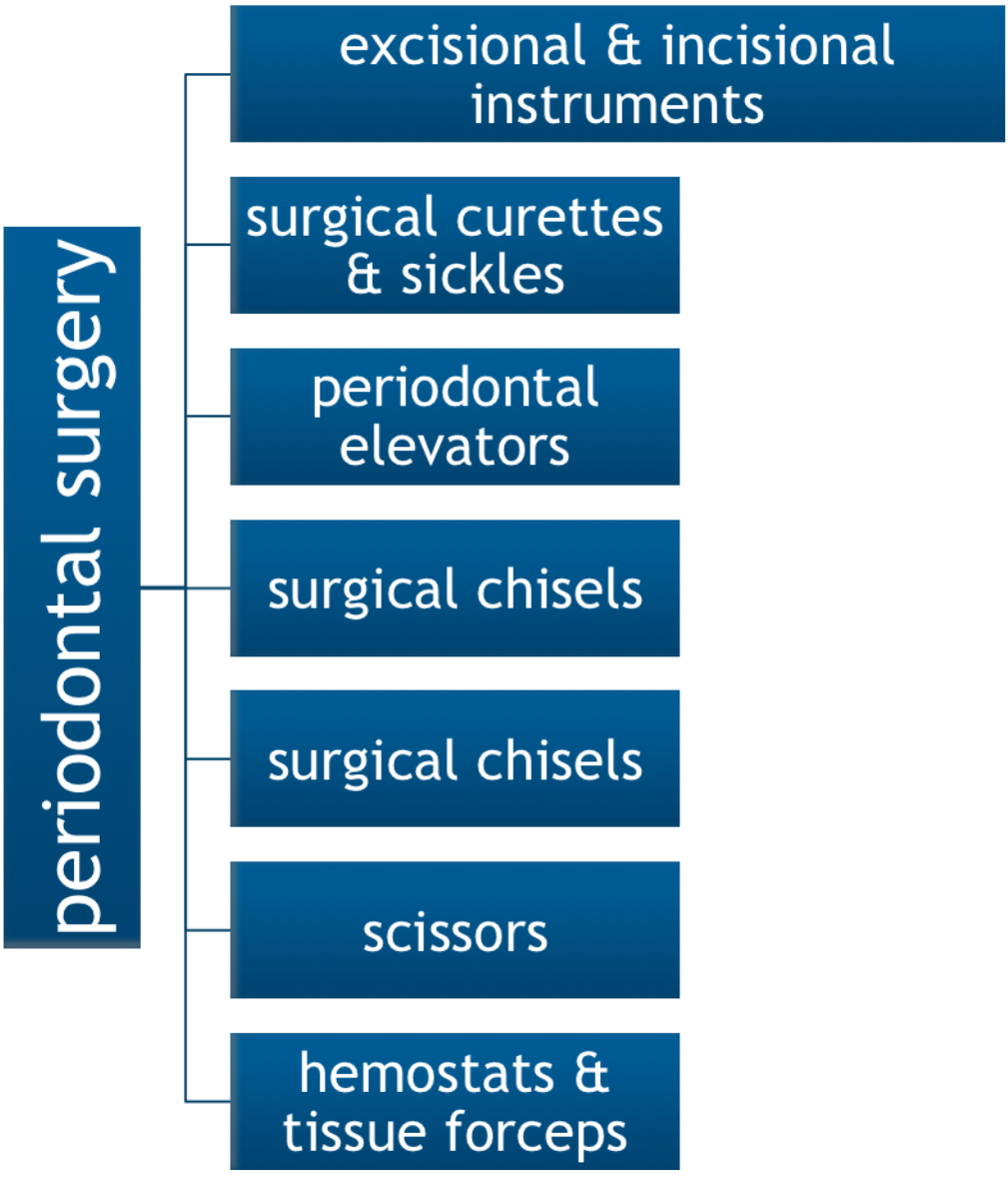
Classification of periodontal surgical instruments:



Excisional & Incisional instruments:

Periodontal Knives:

Eg: Kirkland knives-

- Used for gingivectomy
- Double/single-ended
- Periphery of these kidney-shaped knives is the cutting edge
- For initial bevel incision for gingivectomy or gingivoplasty procedures. Especially effective in retro-molar region

Others:

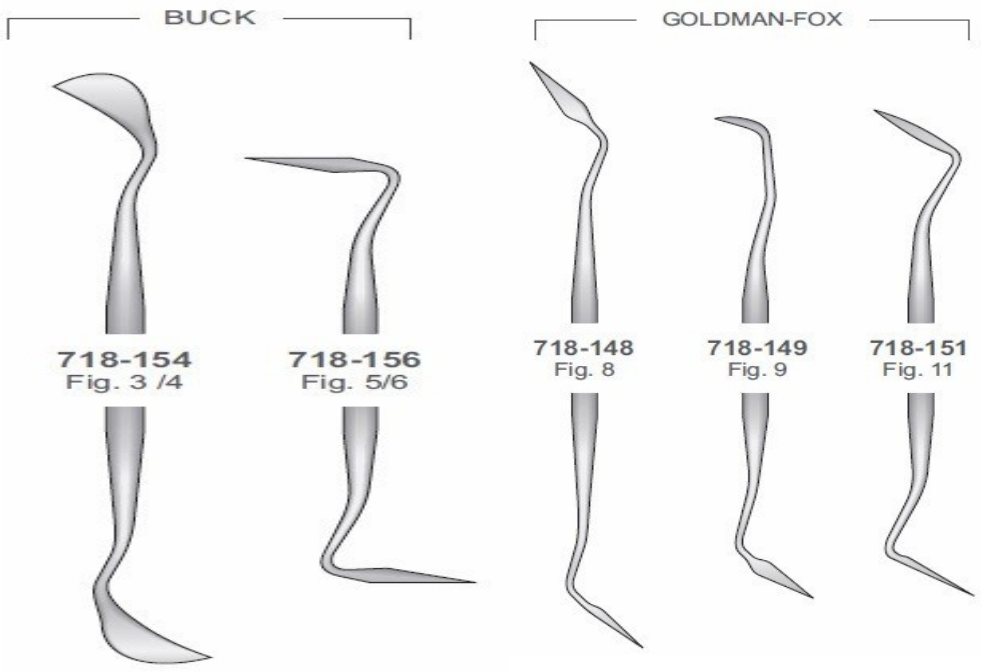
Interdental Knives: Orbans/Merrfield

Buck Knife:

- For incisions that remove or recontour soft tissue. Also useful to excise interproximal tissue

Orban Knife:

- Angled blade and contra-angled shank for posterior use. Also useful for excising interproximal tissue



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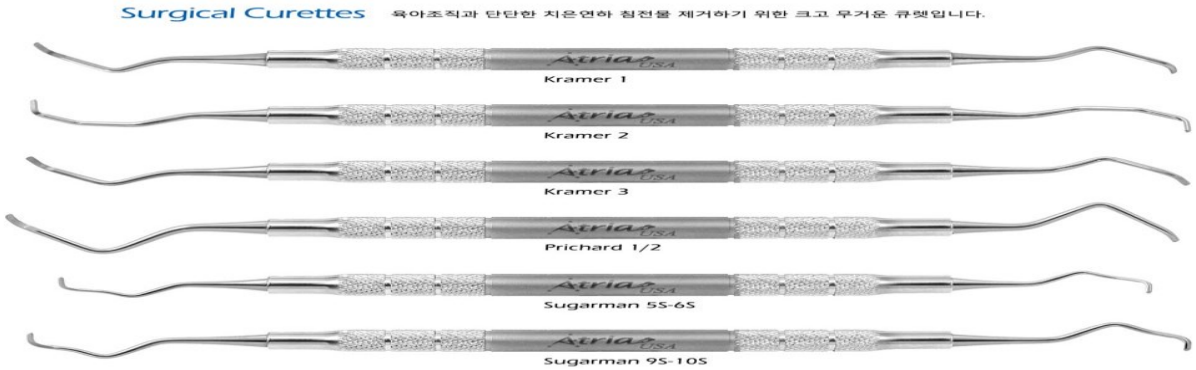
Surgical blades:

The most common blades-# 12D, 15, 15C

- 12D beak shaped blade, cutting edge on both sides, allowing operator engage narrow, restricted areas with both pushing & pulling cutting motions
- #15 blade is thinning flaps & general procedures
- #15 C blade is used for narrower versions of the # 15 blade, is used for making the initial, scalloping-type incisions
- slim design of blade allows for incising into the narrow interdental portion of the flap
- All these blades are discarded after one use

Surgical curettes & Sickles:



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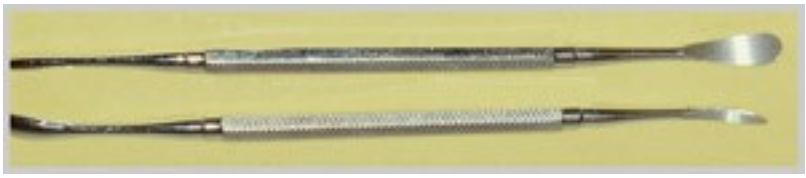
- Larger & heavier curettes & sickles are often needed during surgery for removal of granulation tissue, fibrous interdental tissues & tenascious subgingival deposits
- Prichard curettes & Kirkland surgical curettes are heavy curettes
- Ball scaler # B2-B3 is a popular heavy sickle

Elevators:

Periosteal Elevators are designed for reflecting and retracting the mucoperiosteum after incisions of the gingival tissue

Periosteal elevators are mainly used to lift full thickness soft tissue flaps.



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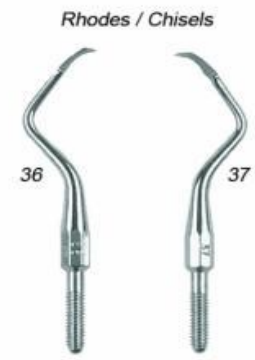
Surgical chisels:

Egs:

1. back action chisel-is used with pull motion
2. Wiedelstadt, Oschenbein chisels- straight chisels- used with push motion

   Oschenbein chisel a useful chisel with a semicircular indentation on both sides of that shank that allows the instruments to engage around the tooth & into the interdental areas
3. Rhodes chisels-back-action chisels

Oschenbein chisels



- Useful for reshaping bone. The semi-circular notches are beveled on each side. Can also be used to reflect flaps or remove secondary palatal flap

Tissue forceps:

- Used to hold flaps during suturing
- Also used & displace the flap after flap has been reflected
- De Bakey forceps in an extremely efficient instruments

Scissors & Nippers:

- Are used in periodontal surgery to remove tabs of during gingivectomy, trim the margins of flaps, enlarge incisions in periodontal abscesses, & remove muscle attachments in mucogingival surgery
- Eg: Goldman-fox # 16 scissors has a curved, beveled blade with serrations

Needleholders:

- Used to suture flaps at the derived position after the surgical procedure has been completed
- Regular types of needle holder

- Castroveijo needle holder-for delicate, precise technique that require quick and easy release & grasp of the suture

castroveijo needle holder

Regular needle holder

POINTS TO PONDER

Causes of excessive bleeding during surgery include laceration of large blood vessels, incomplete removal of

granulation tissue, hypertensive patient, bleeding disorder patient and patient on anticoagulant therapy.

If the surrounding tissue blanches, however, the suture is too tight, which may cause necrosis because of poor vascularization.

Hemostasis should be achieved before, and not by, the application of a dressing. The only clear indication for a dressing is to achieve tissue stasis, such as with a free mucosal graft, or to protect a clot over bone in the interdental denudation technique. Application of dressing is a matter of individual preference.

The possible outcomes of surgical periodontal therapy are: Regeneration, new attachment, long junctional epithelium, root resorption/ankylosis and recurrence of pocket.