Academic Year 3

ARMAMENTARIUM OF ORAL SURGERY

Part 2

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Ph.D in Oral & Maxillofacial Surgery

Objectives (Part 1, 2):

1-Identify the equipments, instruments and materials used in oral surgery.

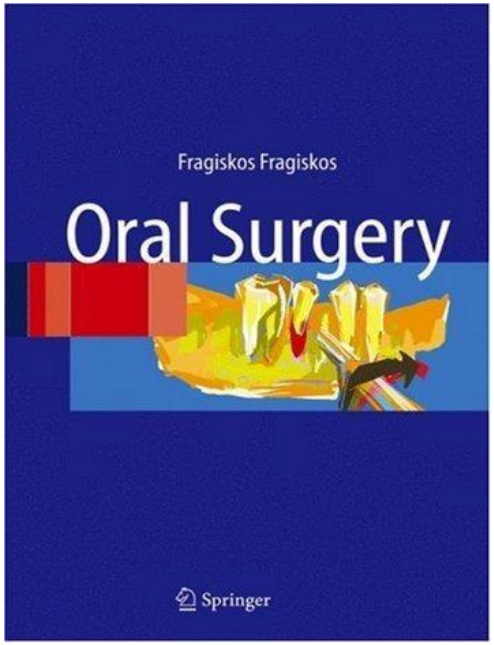
2-Identify the instruments used to make:

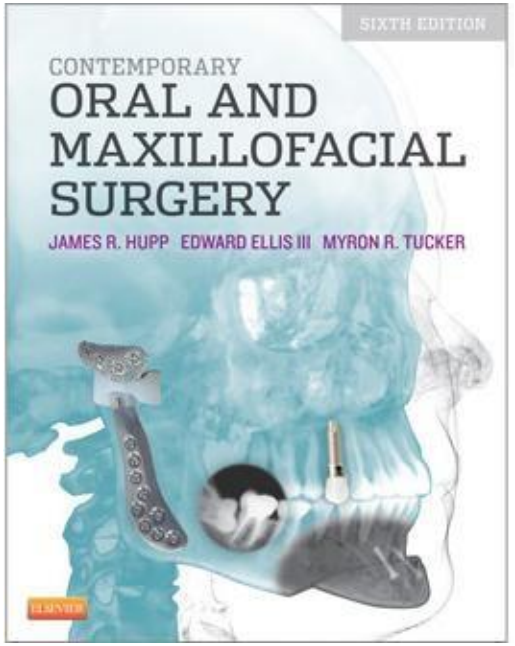
Incision , Flap reflection , Bone cutting , Grasping , Curetting , Irrigation , Suturing.

3-Identify the materials that used for:

Suturing , Hemostasis , Wound covering , Tissue regeneration.

4-Understand the preparation, action, and clinical indication of different types of materials used in oral surgery.





Further reading

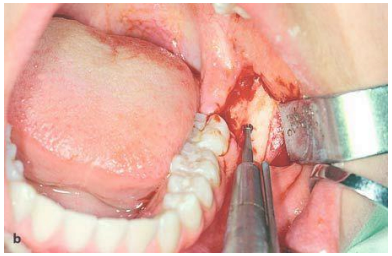
Fragiskos D. Fragiskos (2007): Oral Surgery. Springer
Hupp (2013), Contemporary Oral and Maxillofacial Surgery.Alsevier

A- Instruments

1- Scalpel (Handle and Blade)
(They are used for incising tissue)

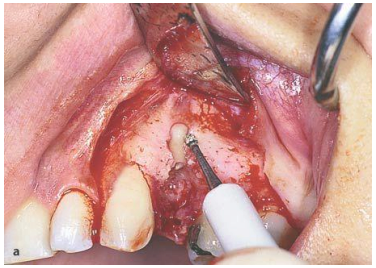
2- Periosteal Elevator
(Used for reflection of the gingiva or mucoperiosteum)

3- Retractors
(Used for retracting soft tissue)



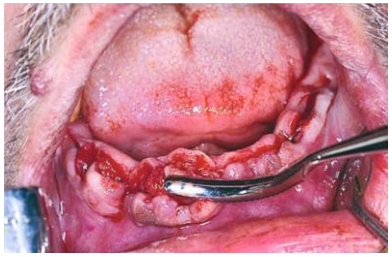
4 Tissue Forceps
(Used for grasping soft tissue)

5 Bone Burs
(Used for removing bone)



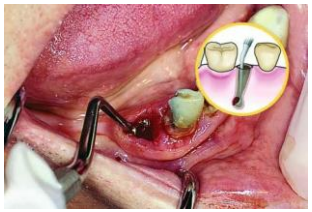
6- Rongeur Forceps
(Used for removing bone)

7- Bone File
(Used to smooth bone)



8- Bone Chisel and Mallet
(Used for bone removal or sectioning (bone or tooth)

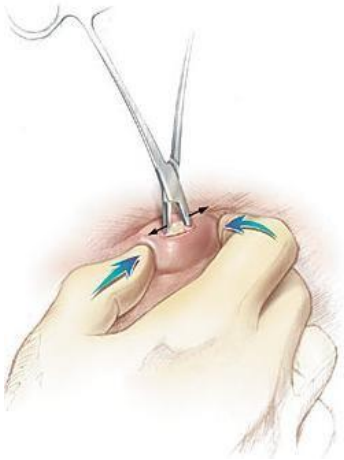
9 Periapical Curettes
(Used for removing soft tissue from bony cavities)

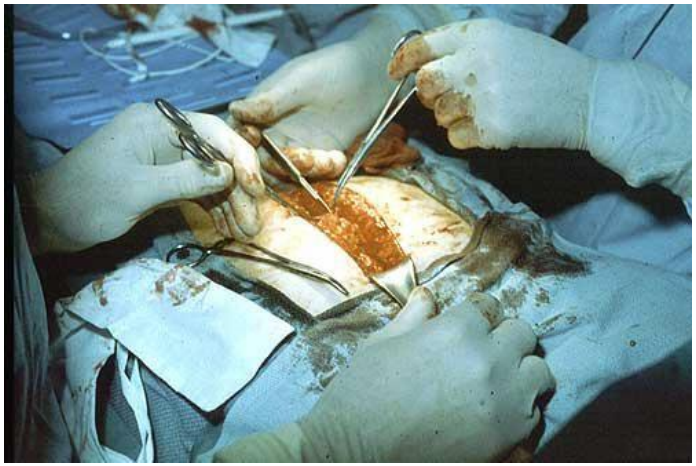


10 Mouth Props & Bite Blocks
(Used for opening or keeping the mouth open)

11- Hemostats (Artery forceps)

(Used for bleeding control by clamping the bleeding vessel)



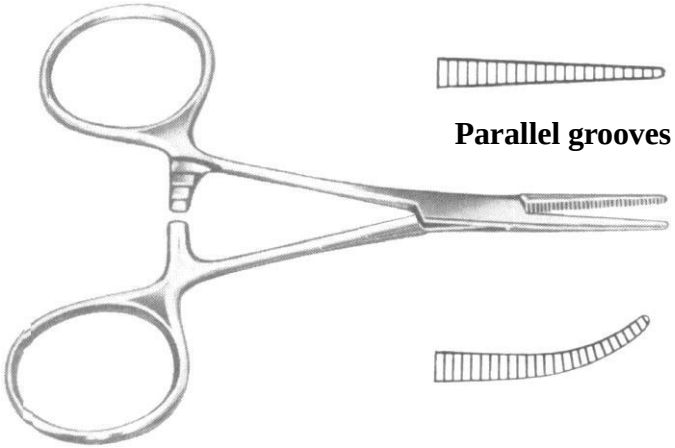


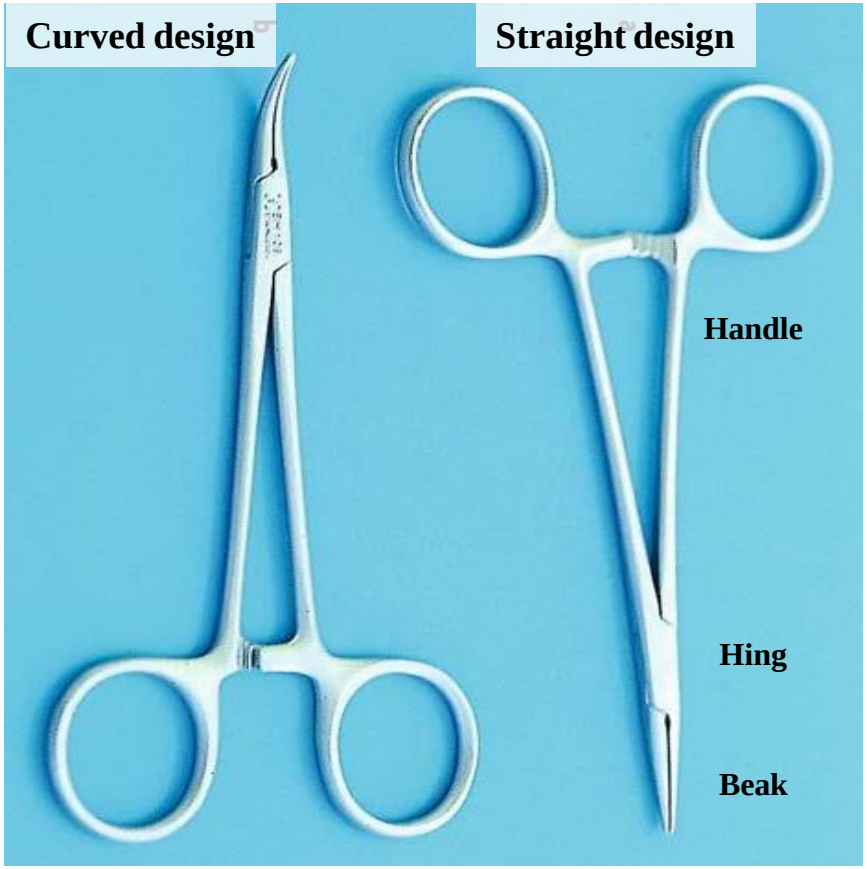
1- It is either straight or curved .

2-The curved type (mosquito) is most commonly used one.

3-The beaks of the hemostat have parallel grooves.

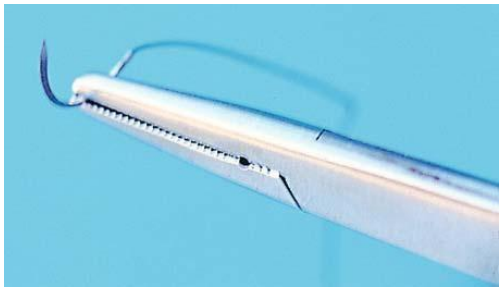
4- Hemostats may also be used for holding soft tissue during biopsy taking, and in drainage an abscess cavity .





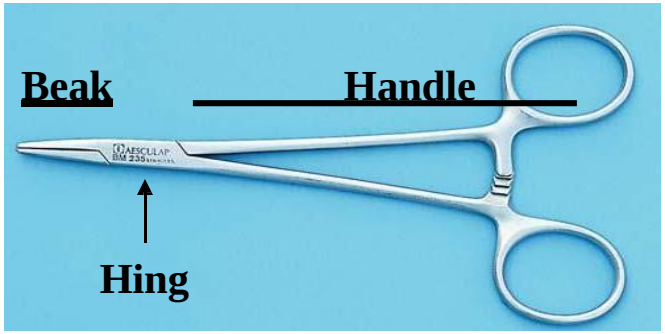
12- Needle Holders

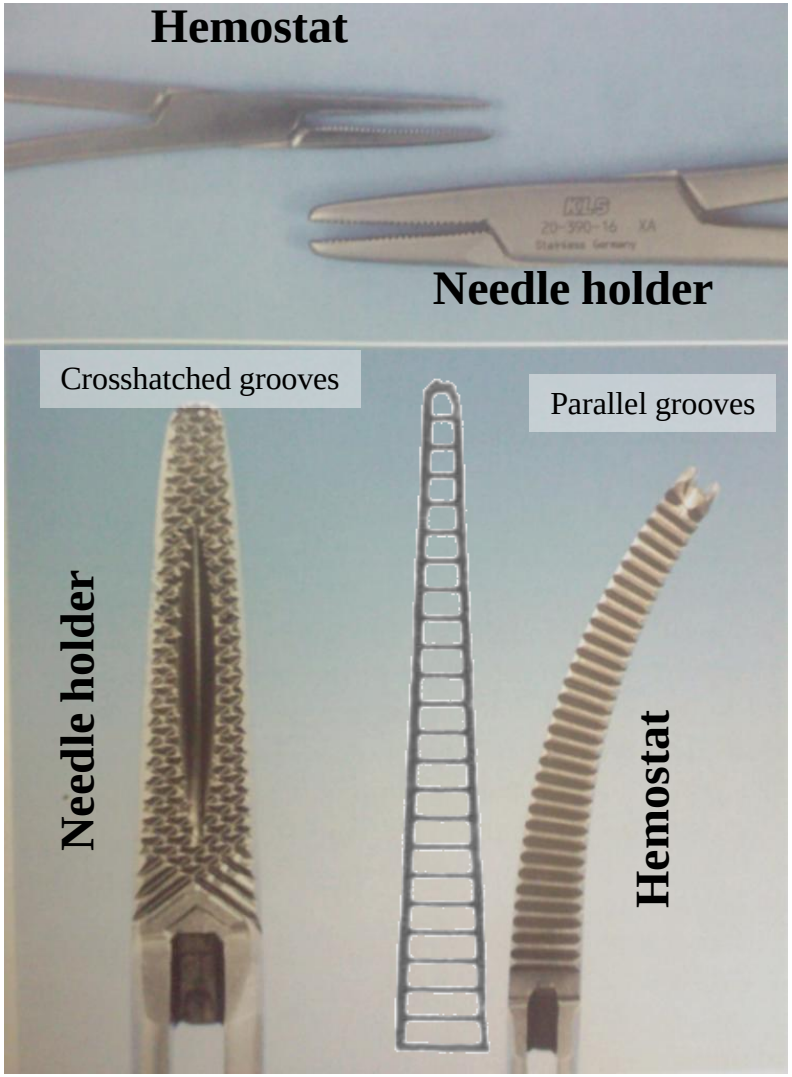
(Used for holding the needle during suturing)



1- It looks similar to a hemostat.

2- In the needle holder, the grooves in the internal surface of the beaks is crosshatched, permitting a firm and stable grasp of the needle, while the beaks of the hemostat have parallel grooves.





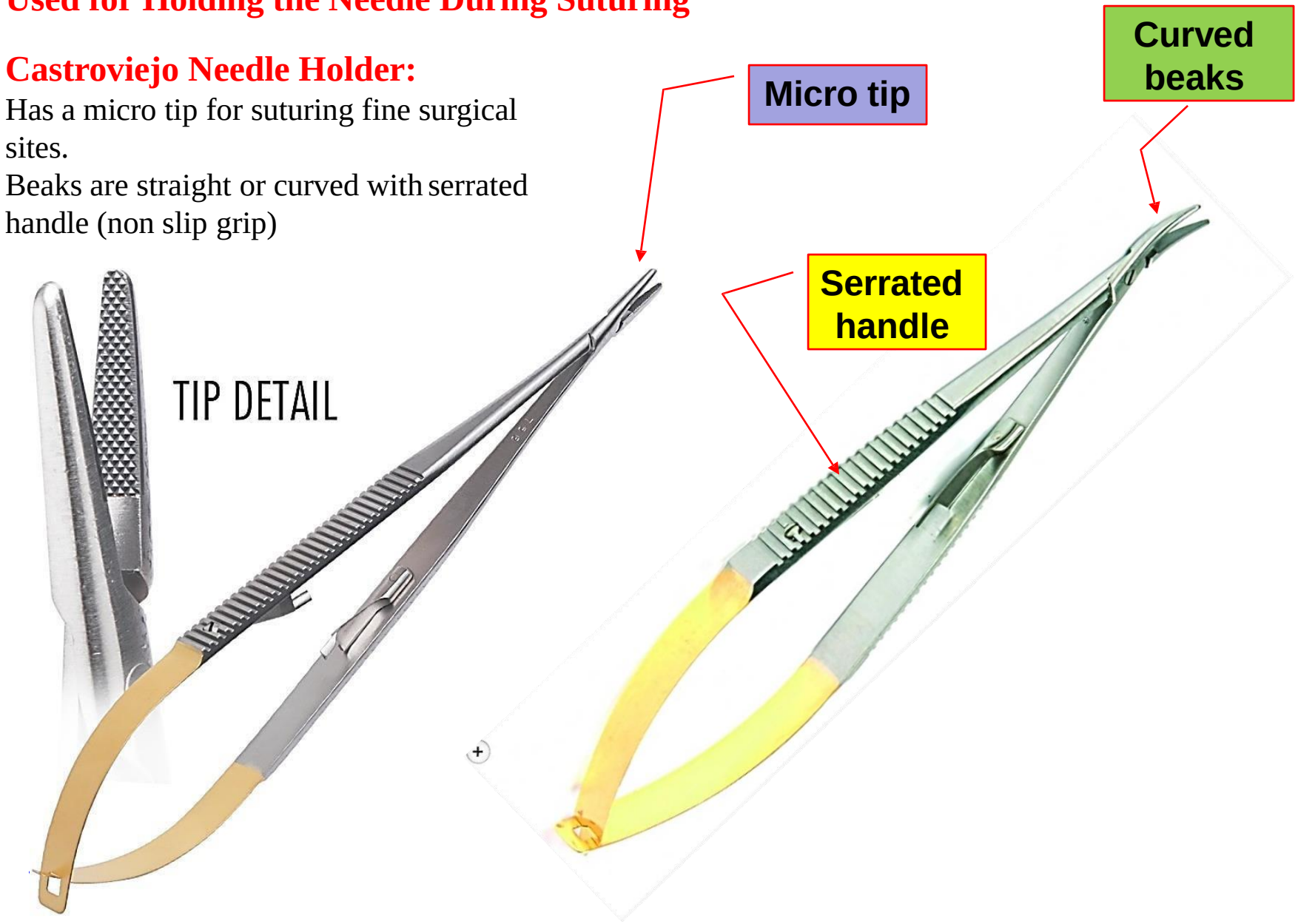
12- Needle Holders

Used for Holding the Needle During Suturing

Castroviejo Needle Holder:

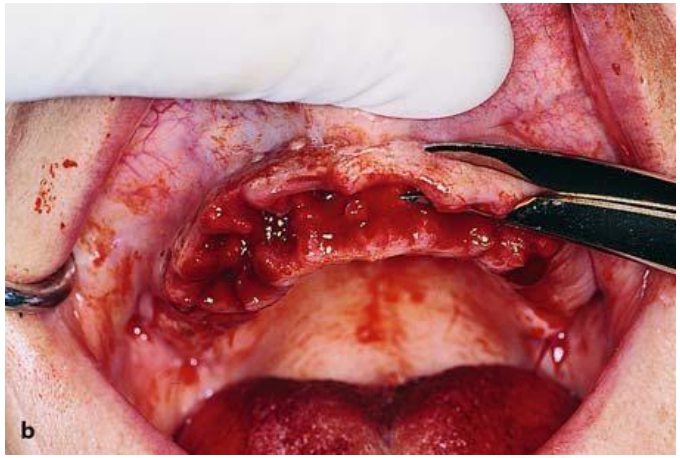
Has a micro tip for suturing fine surgical sites.

Beaks are straight or curved with serrated handle (non slip grip)



13- Scissors
(Used for cutting)

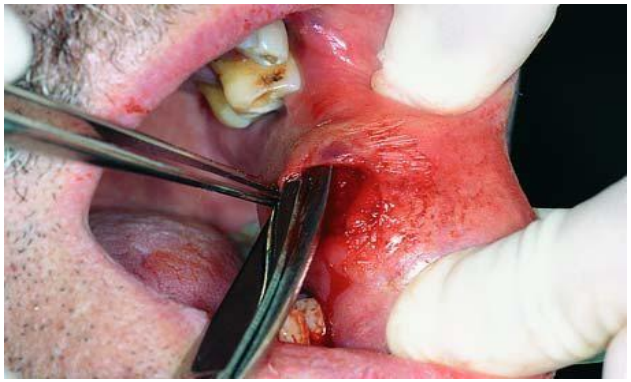
Tissue undermining



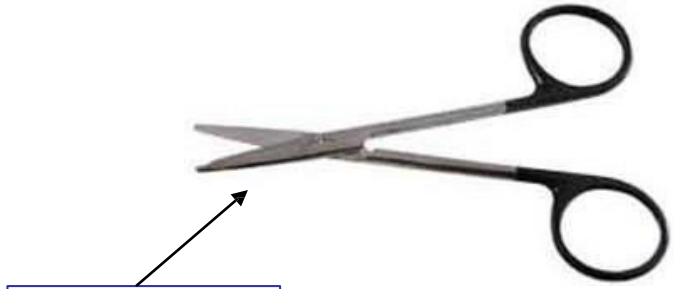
Two types

1 **Suture scissors**

2 **Soft tissue scissors.**

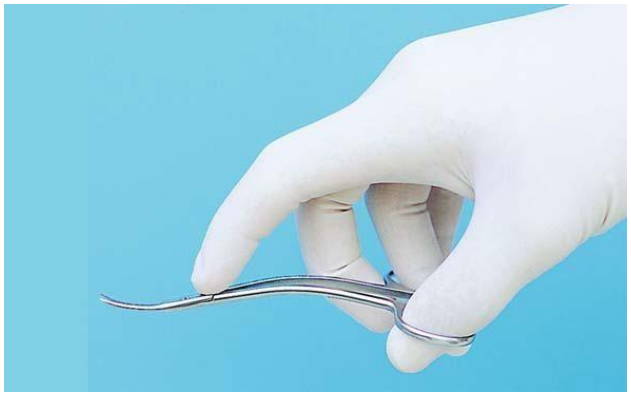


1- Suture scissors have sharp, **short cutting blades** and long handle since their main use is to cut sutures.

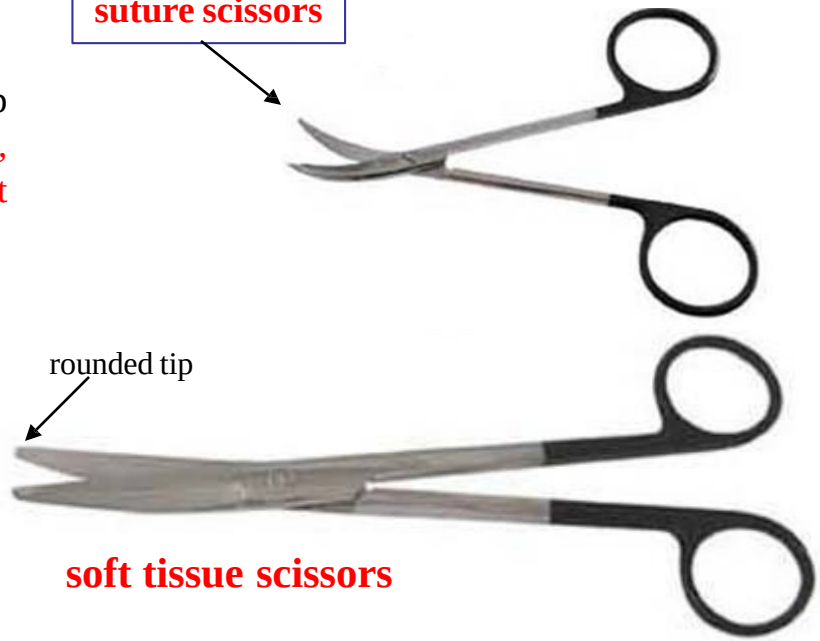


suture scissors

2- Soft tissue scissors have sharp, **long cutting blades** with sharp or rounded tips and are used for removing excess gingival tissue , dissecting and undermining the mucosa from the underlying soft tissues.



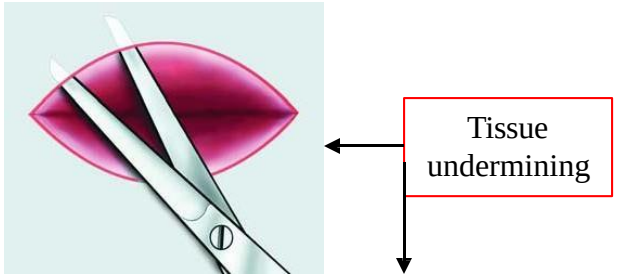
rounded tip

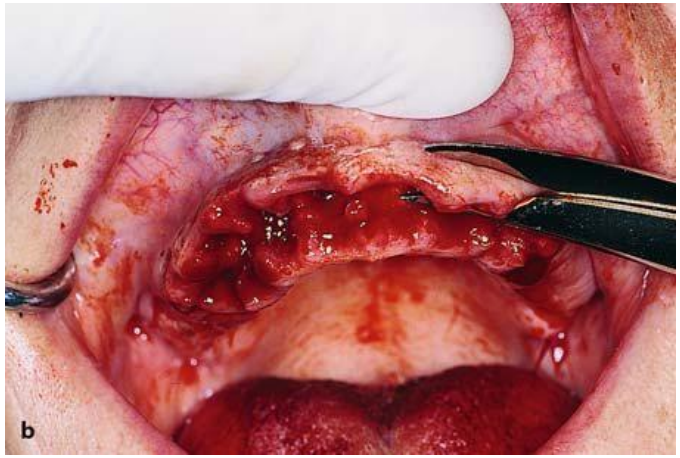


soft tissue scissors

13- Scissors

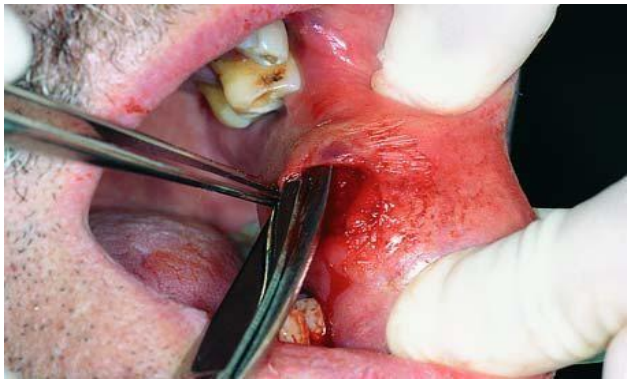
Used for cutting





Two types

1. **Suture scissors**
2. **Soft tissue scissors.**



Castroviejo Micro Scissors:

Have a unique design that allow extremely smooth cutting of fine and coarse tissue with reduced trauma.

Beaks are straight or curved with serrated handle (non slip grip)

14- Irrigation Instruments

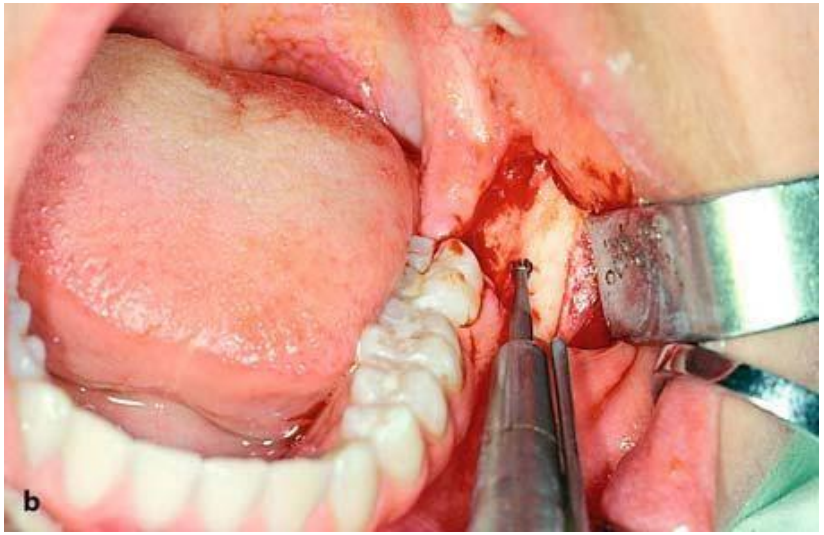
Irrigation with saline solution during bone removal is necessary and achieved by using either plastic syringe with a blunt needle or by using special irrigation system that gives a steady stream of saline solution.

Advantages:

1 It cools the bone burs & prevents heat generation in the bone.

2It increases the efficiency of the bone burs by washing away bone chips from the flutes of the burs.

3Irrigation of the under surface of the flap before suturing is important to remove any debris that interfere with the wound healing.

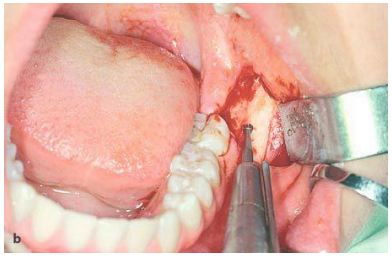


Instruments - Summary

1- For incision making:
Scalpel

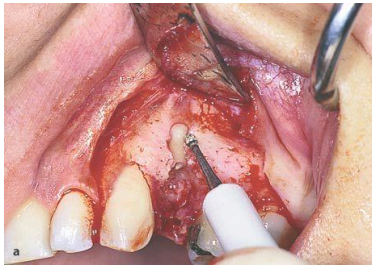
2- For flap reflection:
Periosteal Elevator

3- For flap retraction:
Retractor

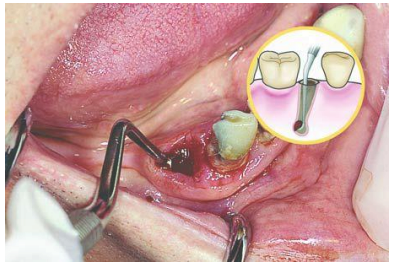


4For grasping tissue:
Tissue Forceps

5For bone removal:
Bone Burs
Rongeur forceps
Bone chisel & mallet
Bone file (smoothing)

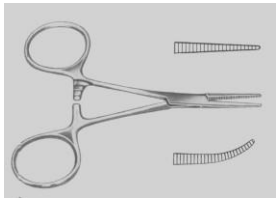


9- For curetting cavity:
Periapical Curette



10For mouth opening or keep it open:
Mouth Prop
Bite Block

11For bleeding control:
Hemostat



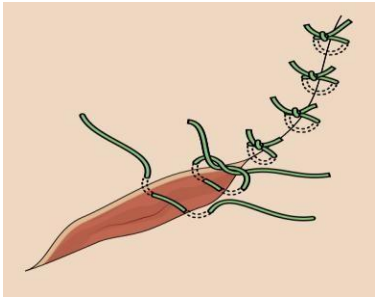
12 For holding needle in suturing:
Needle Holder

13For cutting:
Scissors

14For irrigation:
Plastic syringe
Irrigation system

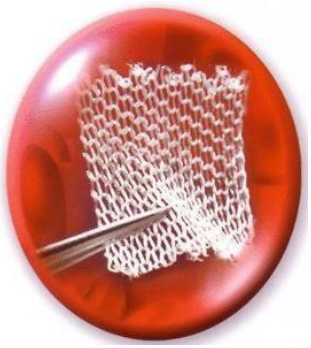
B- Materials

1- Suture Material (stitch)



2- Suture Needles

3- Local Hemostatic Agents

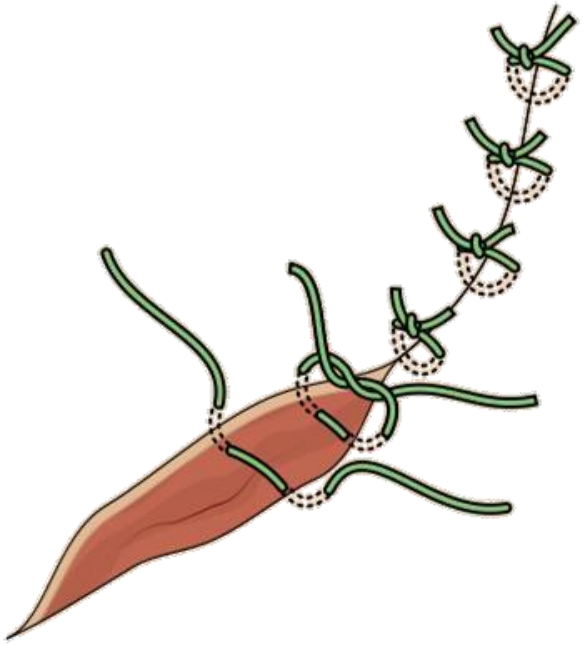


4- Materials for covering wound

5- Materials for Bone Regeneration

B- Materials

1- Suture Material (stitch)



Used to reapproximate the wound edges & protect underlying tissues from infection or other irritating factors.

Different types of suture material are available & classified according to their:

Diameter.
Resorbability.
Whether they are monofilament or polyfilament.

2- Suture Needles

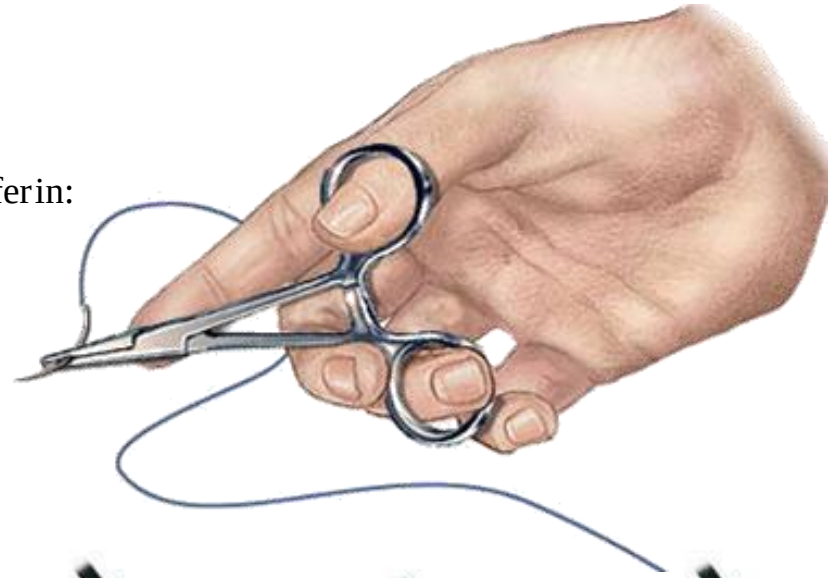
A variety of needles are available, they differin:

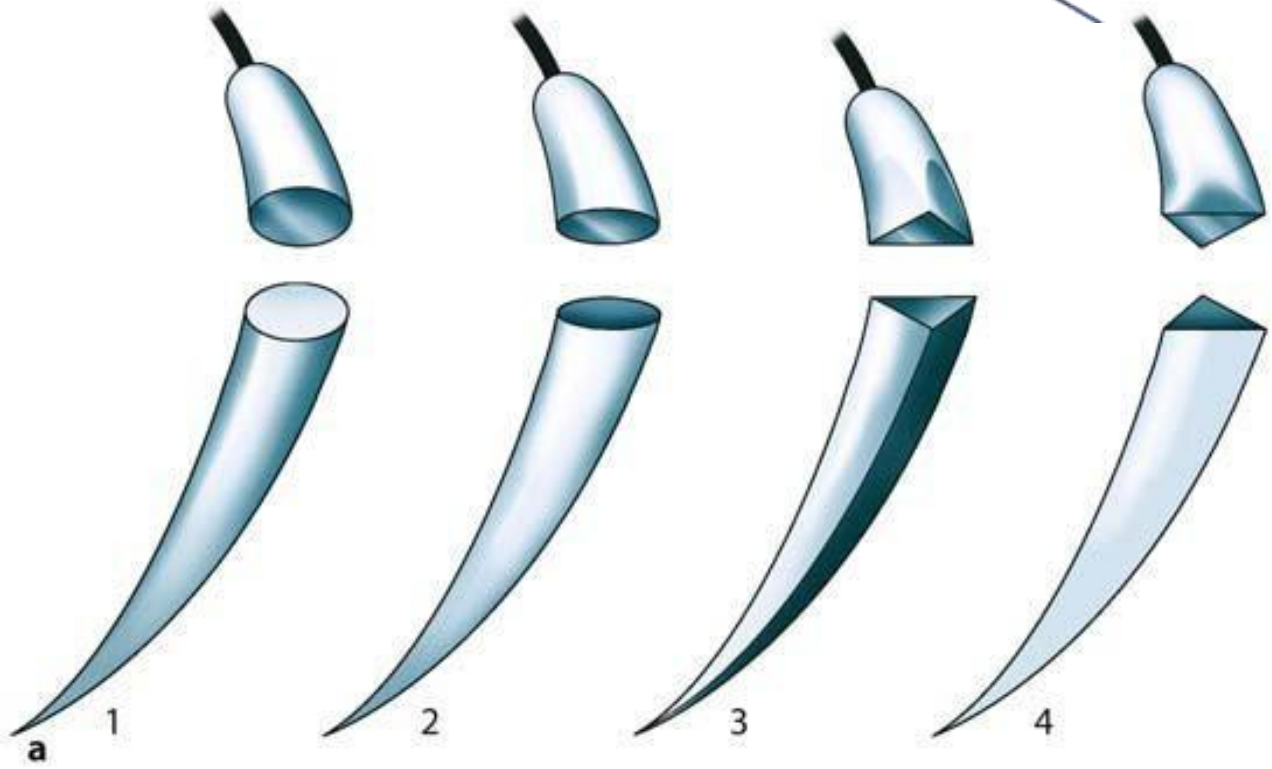
Shape (straight, curved).

Diameter.

Cross-sectional view.

Size (length).





3- Local Hemostatic Agents

These agents are suitable for **local use** only and can stop bleeding which is due to injury of small blood vessels. They are fully absorbed by the tissues within weeks.

The main hemostatic agents are:

A - Natural Collagen Sponge:

preparation: It is a white sponge material, nonantigenic.

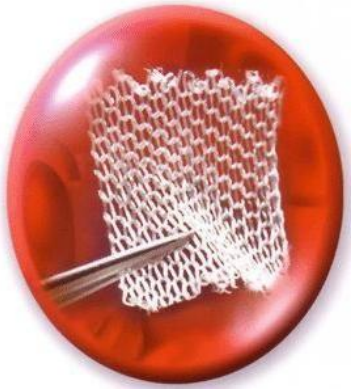
B- Gelatin Sponge (gelfoam):

Preparation:sponge material, nonantigenic.

C- Oxidized Cellulose (surgicel):

preparation: It is available in gauze form or pellet form.

Indication: Post extraction bleeding socket



Surgicel - gauze

Natural Collagen Sponge

Surgicel - pellet

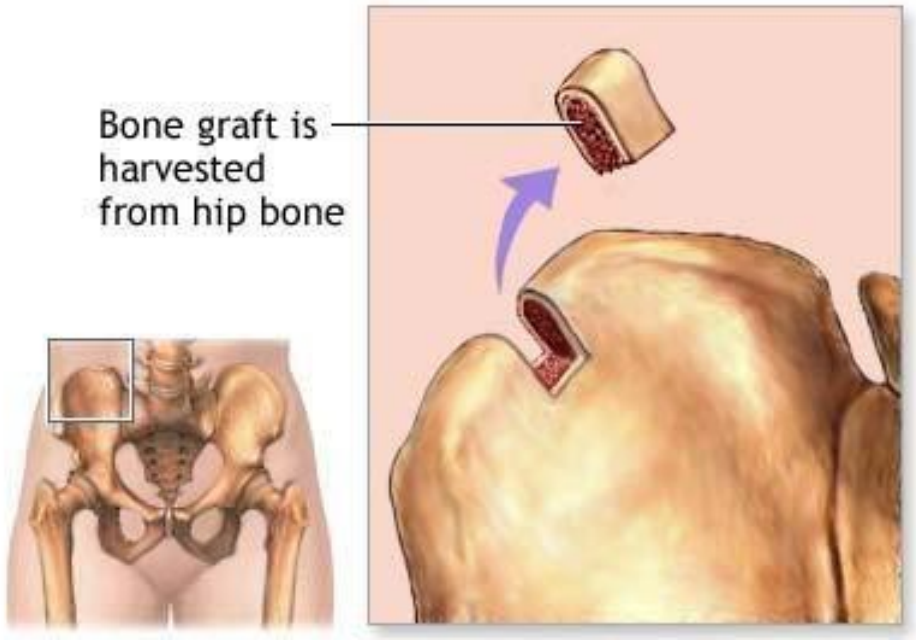
Gelfoam

D- Bone Wax:

Preparation: It is available as a sterilized, nonabsorbable solid plate of wax

Indication: It is used to control bleeding that originates in bone or chipped edges of bone.

Action: Its hemostatic action is brought by mechanical obstruction of the osseous cavity, which contains the bleeding vessels.



4- Materials for covering wound or filling a surgical cavity

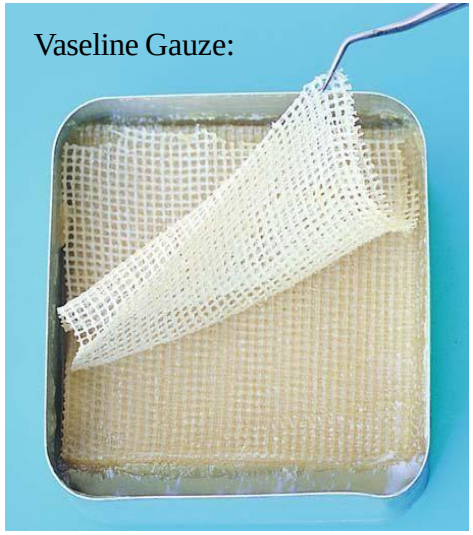
A- Vaseline Gauze:

Preparation:

Gauze in sterilized packages

Indication:

For covering exposed wounds, bone cavities (ex: after cysts removal).



Surgical cavity

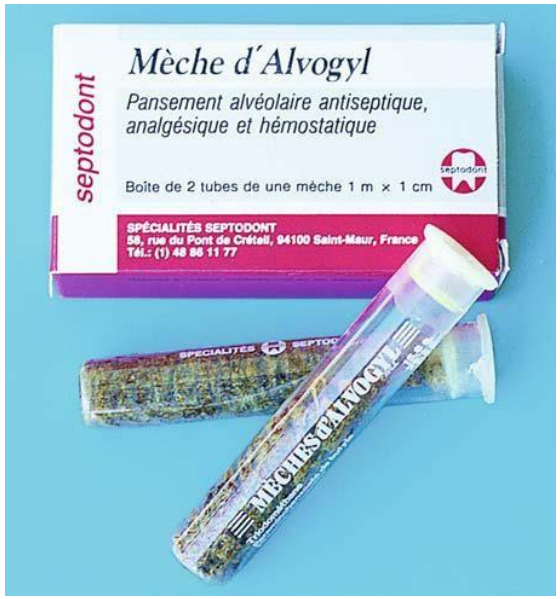
B- Iodoform paste & Gauze:

Preparation:

Available as a ribbon gauze or paste that has antiseptic, analgesic and hemostatic properties.

Indication:

For covering exposed wounds, bone cavities as well as for the treatment of dry socket.



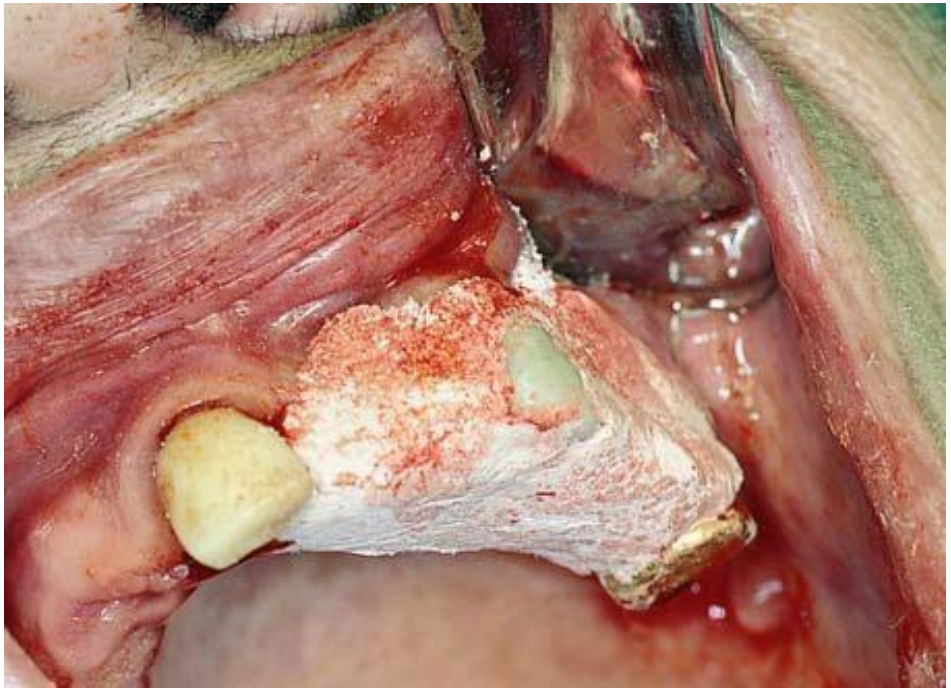
Iodoform paste

Iodoform Ribbon Gauze

C- Surgical Dressing:

Preparation:
This is an autopolymerized putty like paste, available in sterilized package.

Indication:
It is used in periodontal and oral surgery as a temporary protective covering of wounds after surgical procedures until healing occurs.



5- Materials for Bone Regeneration

These materials are used whenever there is a surgical procedure that create a bony defect (removal of cysts, extraction of impacted teeth, etc.) to aid in bone regeneration and eliminates the defect or limits its size.

Indication:

1- Periodontal surgery: useful in the regeneration of periodontal tissues.

2 Implant surgery: for filling of bone defects around an implant.

3Oral surgery: for augmentation of a deficient alveolar ridge for better prosthesis.

Types:

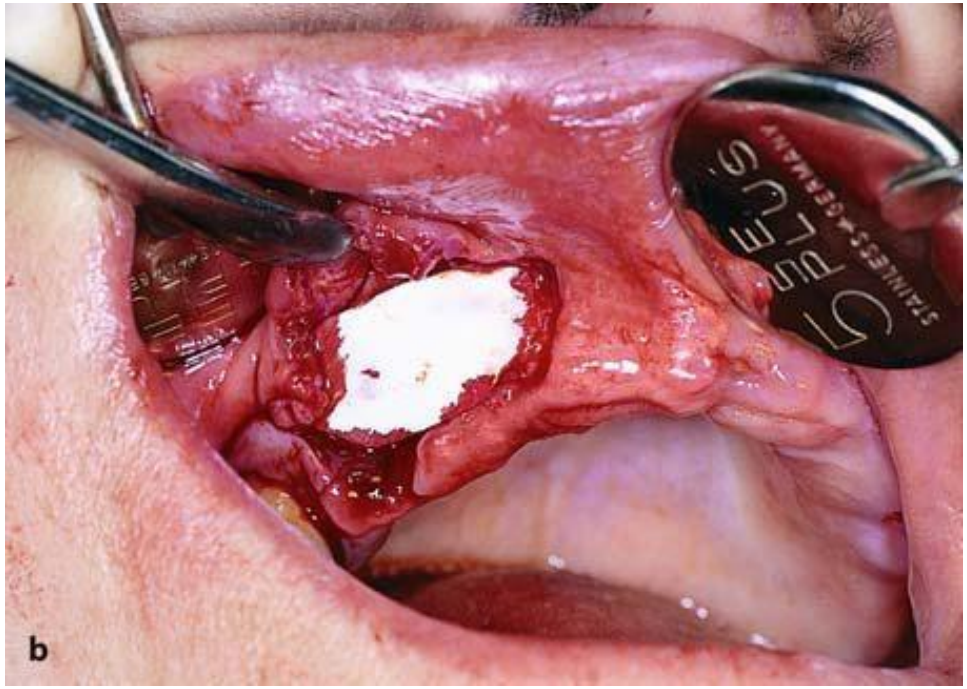
1- Membranes:

These may be:

Absorbable: like collagen membrane.

Nonabsorbable: like titanium reinforced membrane.

Absorbable collagen membrane



membrane in an area of bone deficit after surgical extraction

2- Bone Grafts:

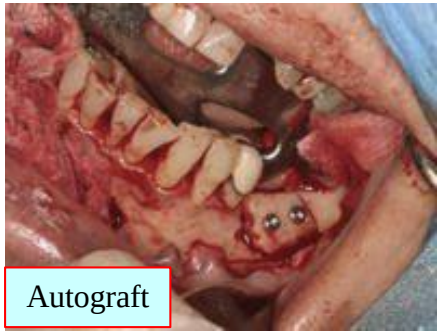
Types of bone graft:

1- Autografts, which are composed of tissues from the same patient.

2- Allografts, which are composed of tissues from another individual.

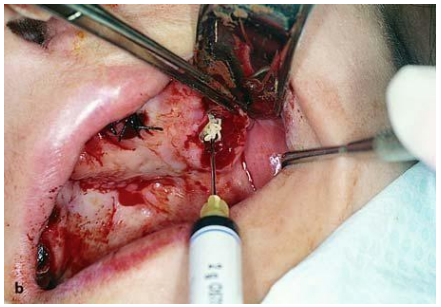
3- Heterografts (Xenografts) which are composed of tissues from various animals.

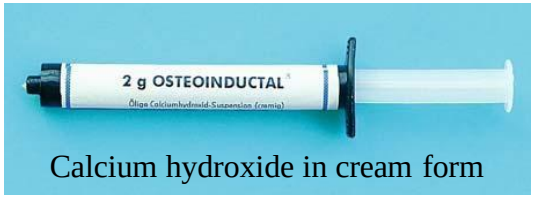
4- Alloplastic grafts, which are composed of synthetic bone substitutes, e.g., hydroxylapatite, and calcium hydroxide in cream form



Autograft

Heterografts of bovine bone (Bio-Oss)





Calcium hydroxide in cream form

hydroxylapatite granules

C- Equipments

1- Sugical Handpiece

Advantages :
1-It functions at high speeds and has great cutting ability.

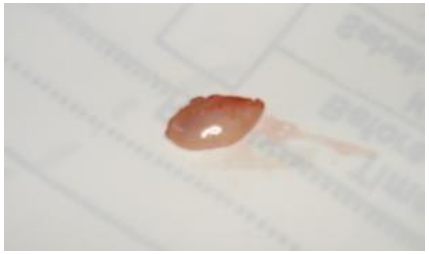
2-It does not emit air into the surgical field.

2- Electrosurgical Unit

This is an electrical device, providing high-frequency electrical current used for:

A- Cauterization of the vessels (hemostasis).

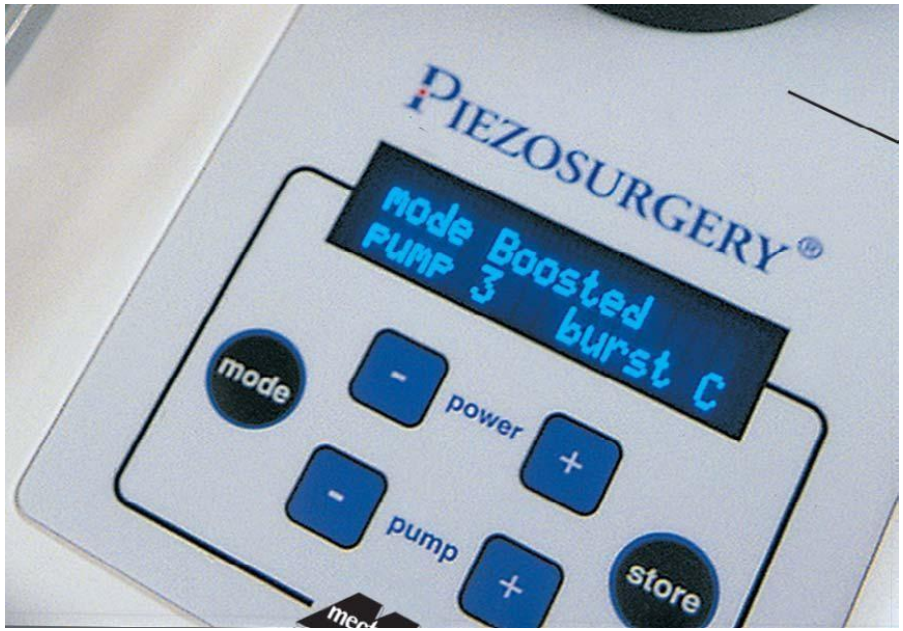
B- Making incision of tissues (electrosurgery).

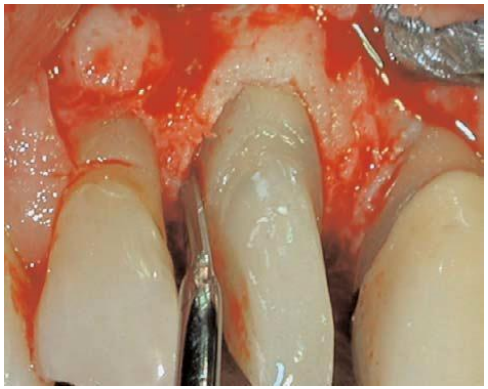


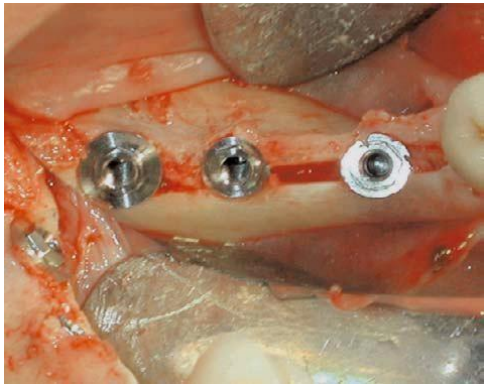
3- The Piezoelectric Bone Surgery (Piezosurgery)

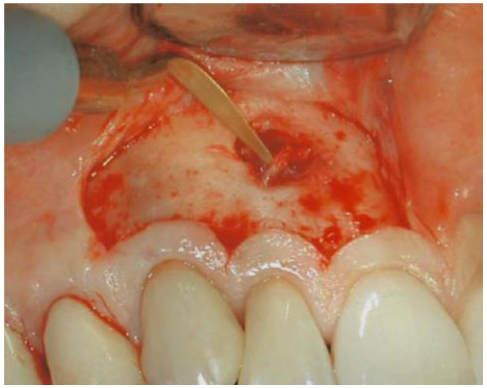
It is a new technology for osteotomy (bone cutting), which utilizes the ultrasonic microvibrations of the blade .

It was invented to overcome the limits of precision and security of traditional instruments in bone surgery.









4- LASER MACHINE

Advantages:

1-Certain procedures performed using dental lasers may not require anesthesia or sutures.

2-Laser dentistry minimizes bleeding because the high-energy light beam aids in the clotting of exposed blood vessels, thus inhibiting blood loss.

3-Bacterial infections are minimized because the high-energy beam sterilizes the area being worked on.

4-Damage to surrounding tissue is minimized.

5-Wounds heal faster and tissues can be regenerated.

Dental applications:

1- Oral surgery:
ex: frenectomy procedure or removal of a benign lesions.

2- Periodontal surgery;
ex: crown lengthening procedure.

3- Conservative dentistry:
Ex : cavity preparation, endo disinfection.

4 -Teeth sensitivity.

5 - Teeth whitening procedure.

6 -TMJ disorder.

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Thank You