INSTRUMENTS USED IN ORAL AND MAXILLOFACIAL SURGERY

DEPARTMENT OF OMFS

INTRODUCTION

- Surgeons have an access to a variety of instruments that are designed to help them in the various surgical treatment of various abnormality and pathology.
- These instruments are used for a wide variety of surgical procedures for both soft and hard tissues.
- A sound knowledge of these instruments and their use is essential to perform routine/ basic surgical procedures.

INSTRUMENT USED FOR HANDLING AND TRANSFER OF STERILE INSTRUMENTS

- CHEATLE'S FORCEPS
  - Angulated instrument with long handle and angulated serrated beaks
  - Has no locking device and stored in container containing antiseptic / bactericidal solution [savlon or gluteraldehyde]

INSTRUMENTS USED FOR PREPARING THE SURGICAL FIELD

- SPONGE HOLDER
  - Has long and expanded ends, forming an oblong tip.
  - Blades have central fenestration and transverse serrations on inner aspect.
  - USES

i. Clean the skin/ mucosa in operative field.

ii. Swab the throat when there is profuse secretions in unconscious patient.

iii. Hold the tongue to prevent tongue fall and airway obstruction in unconscious patient.

INTRUMENTS USED FOR HOLDING THE DRAPES

- TOWEL CLIPS

➢ Two types

A. Pinchter type

B. Backhaus type

➢ USES

i. To fix the drapes in position in order to isolate surgical field.

ii. To stabilize the suction tube, motor cables to the drape.

INSTRUMENTS USED FOR INCISING TISSUES

- BARD PARKER HANDLE
  - No.3 handle is most commonly used which 12cm long.
  - It has a slot for receiving the blade.

- SURGICAL BLADES

1. No. 10 - for large skin incisions
2. No. 11 - for making stab incisions to drain abscess
3. No. 12 - for mucogingival surgery
4. No. 15 – most commonly used for intraoral surgery.

INSTRUMENTS USED FOR RERACTING THE SOFT TISSUES

- LANGENBECK'S RETRACTOR
  - Has a long handle and "L" shaped blade.
  - Most commonly used retractor.
  - Used for retracting cheeks, tongue, mucoperiosteal flap, etc.

- OBWEGESER'S RAMUS RETRACTOR
  - Similar to langenbeck's retractor, only the retracting blade is forked forming a v shaped notch; this is to engage the anterior border of ramus of mandible and aid in good retraction.
  - USES

i. To retract the soft tissue along the anterior border of ramus during sagittal split, ramus osteotomy and coroniodectomy procedures

- AUSTIN'S RETRACTOR
- It is a short right angled, L shaped instrument used for retraction of check, tongue, mucoperiosteal flaps
- It has got no handle, one end is narrower with atruamatic teeth.
- Usually used during surgical removal of impacted third molar.

- VOLKMAN CAT PAW RETRACTOR
  - Blades have prongs that are curved at the tip and it resembles the cat paw.
  - Used to retract soft tissue, skin, tough fascia.
  - Disadvantage- Excessive force may lead to perforation or tear in flap.

- TONGUE DEPRESSOR
  - It is a ‘L’ shaped instrument with a broad, flat, rounded, smooth blade for depressing or retracting tongue for better visualization, to prevent airway obstruction and during endotracheal intubation or extubation.

INSTRUMENT USED FOR REFLECTING THE MUCOPERIOSTEAL FLAP

- MOON'S PROBE
  - It is a thin flat instrument that has a narrow and sharp working tip at right angles to the handle.
  - Used to reflect the gingiva around the tooth prior to extraction.

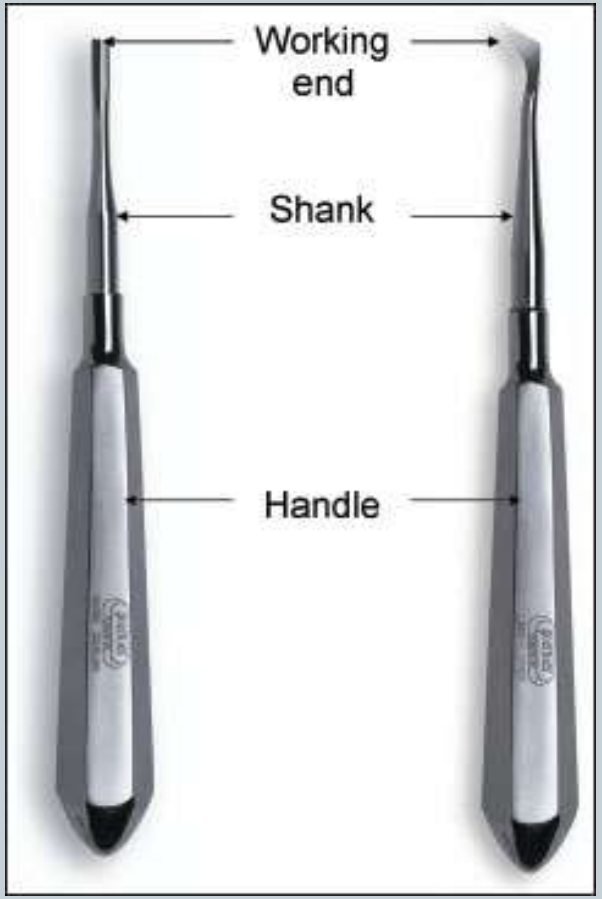
- MOLT'S NO. 9 PERIOSTEAL ELEVATORS
  - It is a double ended instrument.
  - It has a broad spatulated end with sharp edge on one side and a triangular end on other side.
  - Used to release the interdental papilla and clean separation of periosteal attachment from the bone.

- HOWARTH PERIOSTEAL ELEVATOR
  - This is a double ended instrument that are used in elevation of mucoperiostium.
  - It has a flat central handle for balanced grip and 2 long shafts to reach deep spaces.
  - One end has a blunt triangular blade and the other has a rectangular curved blade with sharp edge.

INSTRUMENT USED TO LUXATE THE TOOTH

- ELEVATORS
- Elevators are used to luxate the tooth prior to application of forceps
- They expand the tooth socket facilitating the tooth extraction and to remove the root reminents.
- Parts of elevators

1. Handle
2. Shank
3. Blade



- STRAIGHT ELEVATORS [LONDON HOSPITAL ELEVATOR]
  - The blade is straight and has serrations on the inner surface that faces the tooth to be elevated.

- COUPLAND ELEVATOR
  - It is similar to straight elevator, but the blade is curved and one side has a concave surface that faces the tooth to be elevated.

- APEXO ELEVATOR
  - They have a biangulated and sharp, straight working tip.
  - They are paired instrument for mesial and distal side.
  - Usually used for removal of maxillary root stumps.

- CRYER'S ELEVATOR
  - It is a straight elevator with a triangular blade
  - The working tip is angulated with one convex and other flat surface, which is the working side.
  - Used for extraction of mandibular molar root stumps, where one root is removed and the other is to be removed.

- WINTER CRYER'S ELEVATOR
  - Also known as crossbar elevator.
  - The handle is perpendicular to the shank.
  - Working tip is also angulated to shank with a triangular blade.
  - It is only used in mandible and contraindicated in maxilla.

INSTRUMENTS USED FOR EXTRACTION OF TOOTH

- FORCEPS

❖Two patterns

A. American pattern – hinge is directed horizontally with the handles of the forceps.

B. English pattern – hinge is directed vertically to the handles of forceps.

We use English pattern forceps.

- MAXILLARY EXTRACTION FORCEPS

1. Maxillary Anterior Forceps

- They have identical beaks that are closed straight flat and broad and the handles are straight, not curved.
- They are used for extraction of maxillary incisors and canines.

2. Maxillary Premolar Forceps

- They have identical beaks which are concave on one side facing the operator and they are broad and open.
- Used for extraction of maxillary premolars.

3. Maxillary Molar Forceps

- Beaks are not identical; one is rounded and the other is pointed.
- The pointed beak engages the groove between the buccal roots and the other engages the palatal root surface.
- It is a paired instrument.

4. Maxillary Cowhorn forceps

- Unidentical beaks, one of which is single pointed and other is bifid pointed.
- The single pointed beak engages the furcation between the two buccal roots and the other engages the palatal root.
- It is a paired instrument.
- They are used for maxillary molar, where there is extensive destruction of crown, but the trifurcation of root is intact.

5. Maxillary Third Molar Forceps

- The handles are extra long and the beaks are angulated and open.
- Used for maxillary third molar extraction.

6. Bayonet Forceps

- They have identical, pointed, angulated and closed beaks.
- Two types

1. Thin beak – used to remove single root.
2. Thick beak – used to remove maxillary posterior root stumps that are not separated.

- MANDIBULAR EXTRACTION FORCEPS

1. Mandibular Anterior Forceps

- They have identical, short and closed beaks.
- It has a rivet joint.
- Used for extracting mandibular anteriors.

2. Mandibular Premolar Forceps

- They have identical broad open beaks that are longer then the anterior forceps
- Used for mandibular premolar extraction.

3. Mandibular Molar Forceps

- They have identical, stout, open beaks with pointed tips that engages the bifurcation both at buccal and lingual surfaces.
- Used foe extraction of mandibular molar teeth.

4. Mandibular Cowhorn Forceps

- They have identical, short, pointed beaks that resemble the horns of cow.
- The forceps grips the tooth at the bifurcation between the mesial and distal roots.
- Used to extract grossly carious mandibular molar.

5. Mandibular Root Forceps

- They have identical, slender beaks that are closed and longer then the premolar forceps to enable a deep grip on the root stumps.

INSTRUMENTS USED FOR ACHIEVEING HEMOSTASIS

- HEMOSTATIC FORCEPS
  - Artery forceps is a misnomer.
  - Used for catching the bleeding capillaries, arteries and veins and control bleeding.
  - They have long beak to grasp the vessels and a locking handles.
  - The unidirectional, transverse serration on blades prevent the vessel from slipping.
- TYPES

1. According to size: small (mosquito), medium and long (bailey's).
2. According to shape: straight or curved.

INSTRUMENTS USED FOR HOLDING THE SOFT TISSUES

- TISSUE HOLDING FORCEPS

1. Allis tissue holding forceps

- Short instrument with a catch and the blade have teeth that are delicate.
- Used to hold tissues like fascia, peritoneium, aponeurosis, soft muscles, etc and to provide tension for tissue dissection.

2. Babcock's tissue holding forceps

- It has fenestrated, smooth, nonserrated blade, so less traumatic
- Used to hold and pick up the glands, delicate structures like cyst lining, cut skin margins, enlarged lymph nodes.

- GLAND HOLDING FORCEPS

1. Kocher's variety

- It has two spikes in each blade that are turned to engage the tissue.
- Used to hold the salivary glands, enlarged lymph node and tumor during excision.

2. Swab holder variety

- It differs from the sponge holder in that there are no serrations on the blade.

INSTRUMENTS USED TO KEEP THE MOUTH OPEN

- MOUTH PROP- BITE BLOCKS
  - Can be of 2 variety- rubber and metal.
  - It consist of a vertical block of varying heights, having a concave surface on etheir side of it end to fit on the occlusal surface of maxillary and mandibular arch.
  - Used to keep the mouth open during surgical procedure

- HEISTER'S JAW STRETCHER
  - It has 2 flat blades that are applied between the maxillary and mandibular posterior teeth and are separated by turning the key between them.
  - Slow gradual force is applied till the desired opening is obtained and is maintained for atleast 5 min to break the spasm.

- MOUTH GAG
  - The blades are flat and have serrations that rest on the occlusal surface of maxillary and mandibular teeth
  - The handle has a catch that is fixed at required opening.
  - Used to keep the mouth open of the patient under general anesthesia during surgeries of oral cavity, tonsils and pharynx.

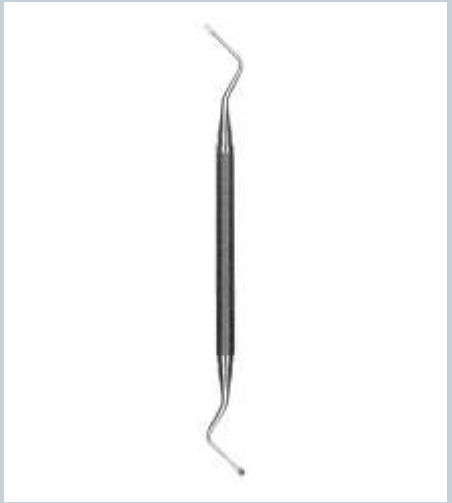
INSTRUMENTS USED TO DRAIN AN ABSCESS

- LISTER'S SINUS FORCEPS

- It has a long narrow slender beaks which are serrated transversely for only half an inch at the tip
- It do not have a lock and the beaks are rounded and bulbous
- Used to open an abscess by Hilton's method, to break the pus loculi.

INSTRUMENTS USED TO REMOVE PATHOLOGICAL SOFT TISSUE FROM BONE CAVITIES

- SURGICAL CURETTES
  - Curette means to clean.
  - Used to scrape a bony cavity or a soft tissue tract to remove pathological tissues.
  - It can be single or double ended and working end may be angulated.
  - Used to remove debris and infected clot from extraction socket, to enucleate cysts, granulomas and intraosseous tumors.



- VOLKMANN'S SCOOP
  - Similar to curettes, but the concavity of working end is more pronounced.
  - Used to collect the contents from sinus tract, chronic abscess cavity, to scoop out the cancellous bone during grafting.

INSTRUMENTS USED TO CUT OR REMOVE BONE

- RONGEURS FORCEPS
  - They have a curved handles that have a spring action this increases the efficiency of instrument.
  - When the handles are released, the instrument automatically opens up this helps to make repeated cuts without much efforts.
  - The beaks are sharp and has a concave inner surface.
  - Used to trim the sharp bony margins, peel of thinned out bone over the cysts and to remove the interradicular septum.

- BONE FILE
  - It has a long cured working end and a short oval working end with horizontal serrations. It is a double ended instrument.
  - It is used in unidirectionally using pull strokes to smoothen the sharp bony margins.

- CHISEL
  - These are monobeveled instruments for cutting bone.
  - They have heavy round and a long flat and rectangular working tip, which is sharp and has a bevel on one side.

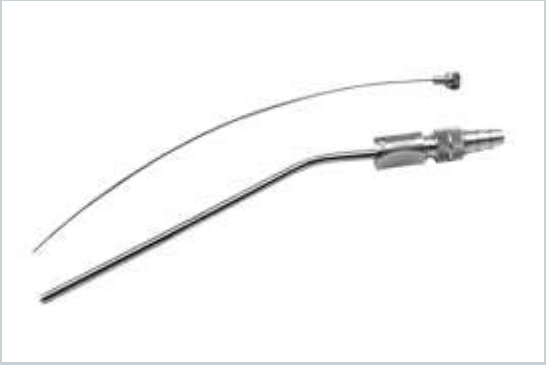
- ROTARY INSTRUMENTS
  - Handpiece – high speed handpiece is used.
  - Burs – no. 557, 703 fissure bur and no. 8 round burs are most commonly used. They are made from stainless steal or carbide.
  - It is the quicker method of bone removal .

- SURGICAL MALLET
- It is made up of steel, lead or wood.
- It is similar to the hammer and is used for giving controlled taps on the chisel, bone gouge or osteotome.
- To be effective the mallet should be used with a loose, free swinging movement of the wrist that gives maximum speed to the head of the mallet without introducing the weight of the arm to the blow.

INSTRUMENT USED TO MAINTAIN THE SURGICAL FIELD CLEAN

- SUCTION APPARATUS
  - Commonly used is vacuum pump apparatus
  - It is electrically operator with the help of a motor and it is attached to a trolley.

- SUCTION TIP OR CANNULA
  - It maintains a clean field by sucking away blood, flushing solution, debris, cystic fluids.
  - A stillet is provided to clean the lumen in case of clogging.



- SUCTION TUBE
  - It is connected to suction apparatus to one side and the suction tip at the other.
  - It is made up of silicon polymer.

INSTRUMENTS USED TO SUTURE THE SOFT TISSUE

- NEEDLE HOLDER
  - It is a straight instrument with a short, stout working tip and it has a cross- hatched serrations with a single vertical groove to grip the needle.
  - The handle has a catch.
  - Instrument is held between ring finger and thumb, index and the middle finger support the needle holder.

- SUTURE CUTTING SCISSORS
  - Used for cutting the suture ends.
  - They can be straight, curved, angulated or nonangulated
  - They have long delicate handles and short cutting edge
  - Some needles have hook shaped point on one blade.

- ADSON'S TISSUE HOLDING FORCEPS

➢ Types

1. Plain
2. Toothed

➢ Plain tissues holding forceps have serrations on the inner aspect to aid in better grip.

➢ It should not be graped too tight to avoid crushing of tissues.

➢ They are used to hold skin, fascia, blood vessels, nerves, delicate muscle.

➢ Toothed forceps are used to hold the tough structures like aponeurosis, coarse muscles.

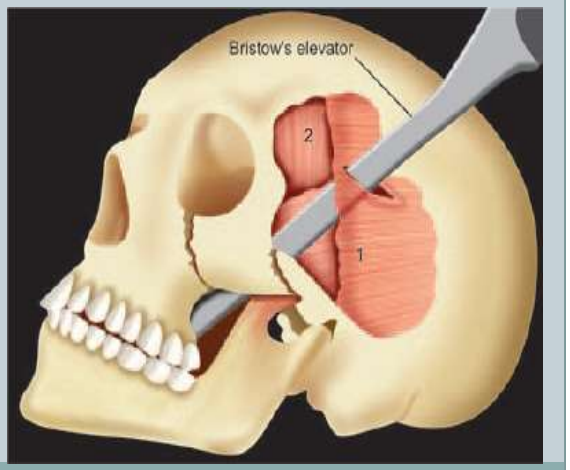
INSTRUMENTS USED FOR TREATMENT OF FRACTURE OF JAW BONES

- ROWE'S MAXILLARY DISIMPACTION FORCEPS
  - It consist of one straight and one curved blade and they are padded for atraumatic purpose
  - The straight blade passes into the nostrils and the curved one enter the mouth and graps the palate, this is to accommodate the maxillary anterior teeth.
  - USES
  - To disimpact the maxilla in fresh le fort fractures.
  - To check the free movement of maxilla after le fort osteotomy procedure

- HYTON WILLIAM'S FORCEPS
  - This forceps has 2 widely divergent curved beaks that engage the maxilla behind the tuberosity.
  - It is used in conjugation with the Rowe's maxillary disimpaction forceps to mobilize the maxilla.

- WALSHAM'S FORCEPS
  - It is used to manipulate the fractured nasal bone fragments.
  - They have a padded and a unpadded blades that are curved.
  - Ash's forceps is used for manipulation of nasal septum.

- BIRSTOW'S PERIOSTEAL ELEVATOR
  - In the oral surgery it is used to treat the zygomatic fractures.
  - It is used to reduce the fractured segments of zygomatic arch in the gillies temporal approach.
  - It has a curved blade and fenestrated handle for a better grip.
  - In orthopedic surgeries it is used to retract the hard and soft tissues.




THANK
YOU