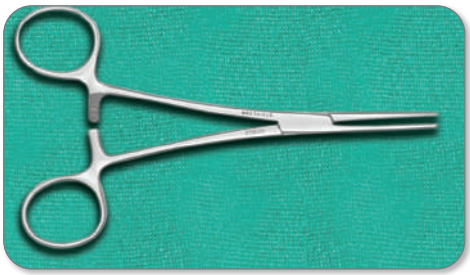
Chapter 1

Forceps

ARTERY FORCEPS



Background

James Greig Smith (1854–1897), a Scottish surgeon, invented this forceps in 1895. Artery forceps is used to compress the artery and seal small blood vessels or to hold the artery out of the way during surgery.

Description

- It is made of steel and is nickel-plated. They measure about 140 mm in length. It is classified into two types as straight forceps and curved forceps:
  - The curved artery forceps is generally used for hemostat whereas the straight forceps are used for rough work like holding the stay sutures.
- It has a ratchet and two blades with uniform serrations. Transverse serration is present only at the tip.
- The locking box is used for the flexible use of forceps and the finger ring is used for holding the forceps during the surgery.
- This forceps has hollow jaws, which could compress vessels at the sides.

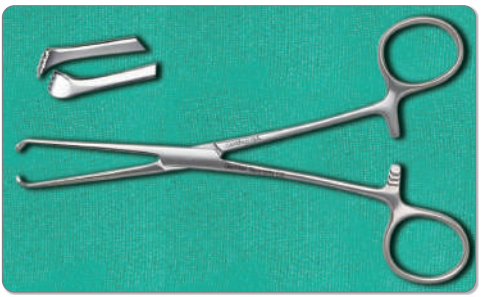
Indications/Uses

- The forceps can be used as a hemostat for clamping the blood vessels in case of hemorrhage.
- These forceps aid in grasping the tissues during operation (opening and closing peritoneum).

Points to Remember

- The thumb and the ring finger are placed through the ergonomic rings of the forceps, the index finger is placed along the well-designed shaft and, together with the middle finger, steady the instrument.
- With the locks, the paramedics and surgeons are able to leave many artery forceps on the patient's blood vessels particularly when they are bleeding heavily.

ALLIS FORCEPS



Background

Oscar Huntington Allis (1836–1921) designed Allis tissue forceps. He was a surgeon from Presbyterian Hospital, Philadelphia, USA. He invented this forceps in 1901.

Description

- It is 15 cm (7½ inches) in length.
- It is an alternative forceps to the Green Armytage forceps in hemostatic clamp.
- It is a surgical instrument with sharp teeth, used to hold or grasp heavy tissue.
- It is also used to grasp fascia and soft tissues such as breast or bowel tissue.

Indications/Uses

- This forceps is utilized for holding intense structures, like rectus sheath in surgeries, lower segment cesarean section (LSCS), tubectomy and hysterectomy. It is used:
  - To forcibly grasp or retract tissues or sutures
  - To catch hold of the anterior lip of the cervix in dilation and evacuation (D&E) operations.
  - To hold the apex of the episiotomy wound during repair.
  - To catch hold of the torn ends of the sphincter ani externus prior to suturing repair of complete perineal tear.
  - To hold the uterine fundus during the myomectomy, vaginal hysterectomy, metroplasty. Fenestration with a horizontal serration so that it could prevent slippage of fine structure.

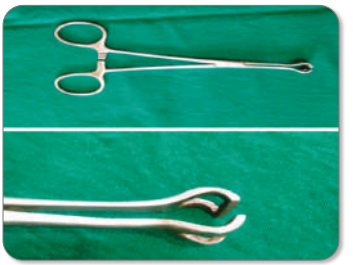
Also Know

Metroplasty: It is a reconstruction surgery used to repair congenital anomalies of the uterus.

Points to Remember

- The working ends of the forceps are nontraumatic as there is no sharp tooth.
- The blunt tips are useful in holding the tubular organs and blades provide space for part of the tissue and decrease the intraluminal pressure, which protects the organs from getting injured.

BABCOCK'S FORCEPS



Background

Dr William Wayne Babcock (1872–1963) invented Babcock forceps, while he was working at Temple University Medical College, in Philadelphia. He was an American surgeon.

Description

- It measures about 16 cm in length.
- These forceps work with finger ring ratchet mechanism, consist of broad and rounded grasping surface and tips are triangular orifice, fenestration with a horizontal serration so that it could prevent slippage of fine structure.
- They are frequently used with intestinal and laparotomy procedures.
- Babcock's forceps are similar to Allis forceps; however, less traumatic due to their wider, rounded grasping surface.

Indications/Uses

- It aids in holding the cylindrical structures, like fallopian tube in tubectomy as in modified Pomeroy's technique.
- It is most commonly used in salpingectomy.
- It is also used during radical hysterectomy, internal iliac artery ligation and laparoscopic operations.
- It can be used to hold the uterus.

Also Know

Pomeroy's technique: The Pomeroy technique is one of the most frequent methods of tubal ligation surgery and is characterized by resection (or removal) of a portion of the fallopian tube. This involves tying a suture around segment of the tube and removing it.

Points to Remember

- The working ends of the forceps are nontraumatic as there is no sharp tooth.
- The blunt tips are useful in holding the tubular organs and blades provide space for part of the tissue and decrease the intraluminal pressure, which protects the organs from getting injured.

PUNCH BIOPSY FORCEPS

Background

This instrument was designed by EL Keyes (1887–1956). Keyes' punch biopsy forceps (KP) is being used since long to diagnose skin tumors and inflammatory lesions.

Description

The blades measure about 25 cm in length.

Indications/Uses

- It is useful in cervical biopsy.
- It is also used for diagnostic procedures, like split punch biopsy for papillary dermis.
- It is also used in therapeutic procedures, like removal of cyst or nodules.

Points to Remember

- The biopsy is taken in OPD without anesthesia.
- The site of biopsy can be either from the Schiller's iodine or suspected area or directed under colposcopy.

DISSECTING FORCEPS (TOOTHED AND NONTOOTHED)

Background

This instrument was designed by Stephen Hales (1677–1761).

Description

- These are spring forceps (nonratchet style) used by compression between thumb and forefinger.
- These forceps measure about 15 cm in length.
- They are classified into two types, toothed and nontoothed, non-toothed forceps are less traumatic and are used inside the peritoneal cavity.

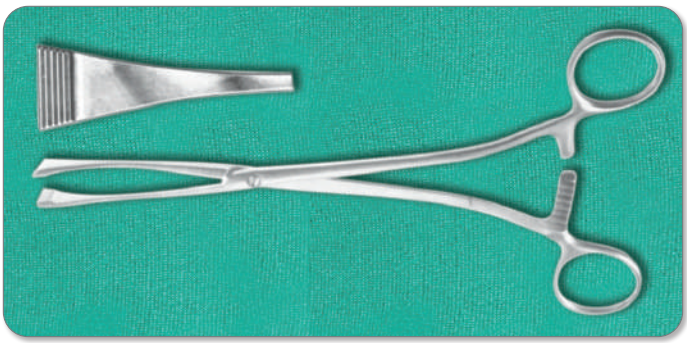
Indications/Uses

- Dissecting forceps is utilized in holding the solid structures such as rectus sheath, of vaginal flaps, pelvic floor repair (PFR) or the skin edges during suturing.
- It is used to hold nerves and blood vessels.
- It is also used to hold or grasp the tissue edges of the wound.

Points to Remember

- Toothed forceps is used to hold nerves and blood vessels.
- Nontoothed forceps is used to hold skin and fascia and used for manipulating needle.

GREEN ARMYTAGE FORCEPS



Background

Vivian Bartley Green-Armytage, a British gynecologist invented Green Armytage forceps (1882–1961).

Description

- It has wide blades with horizontal separation.

- It has locking ring handle, consisting of wide blades with grooves to get a tight grip on the tissue.
- The forceps are of two types—straight and curved.
- They measure about 16 cm in length.

Indications/Uses

- The forceps is used as hemostat in cesarean section and the wide area can be compressed as tips are broad.
- It is used for holding the edges of the skin in the lower segment of cesarean section operation.
- It is used to grasp fibrous tissues of uterus.
- It is also used to grasp uterine tissue in hysterectomy, myomectomy and uterine repair. It is also used in place of sponge holding forceps.

Points to Remember

- The Green-Armytage uterine clamp is used to grasp fibrous tissue, especially the angle of the uterus securely and to clamp bleeders to achieve hemostasis during gynecological surgeries including cesarean section, hysterectomy, myomectomy and uterine repair.
- It is also used in general surgeries to grasp and maneuver the rectus sheath during ileostomy, exploratory laparotomy, ileal resection and intestinal anastomosis.

KOCHER'S FORCEPS (CLAMP)

Background

This instrument was invented by Emil Theodor Kocher (1841—1917) who was a Swiss physician and medical researcher. He received Nobel Prize in Medicine in 1909.

Description

- It measures about 5½ inches in length.
- The blades can either be curved or straight and may be used as clamp too, the blades have the transverse serration and tips are sharp-toothed.
- The toothed tips are to avoid slippage of tissues.

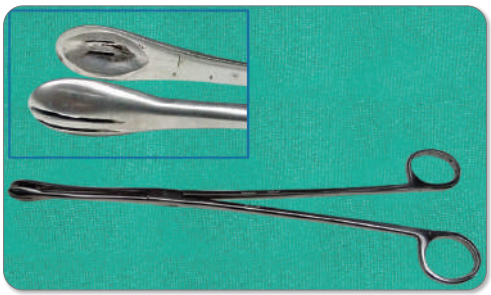
Indications/Uses

- It is utilized for holding fallopian tube in hysterectomy.
- Useful in hysterectomy to clamp fallopian tube which are then transfixed.
- It is utilized in salpingectomy in case of ectopic or oophorectomy operations.
- It is also used for clamping umbilical cord in newborn at the time of delivery.
- It aids in artificial low rupture of membranes (ARM).

Points to Remember

- The Kocher's forceps is a hemostatic forceps.
- It is specifically designed to catch the bleeder that are deep within tissue hence it is ideally used on tough structures like palms, soles or scalp.
- The forceps catches the structure that is bleeding and crushes the bleeder that results in clogging.

OVUM FORCEPS



Background

Ovum forceps was designed by George Washington Loomis Sr (1779–1851), who was a British surgeon.

Description

- It measures about 26 cm in length.
- It is a miniature of the obstetric forceps. Each branch has a handle, a shank and a blade.
- The two branches are attached by a screw joint and have no lock.
- The tip is blunt, rounded and cup-shaped. It is mainly designed to hold large tissue. This instrument has no catch.
- It has the feature of preventing the perforation of wall.

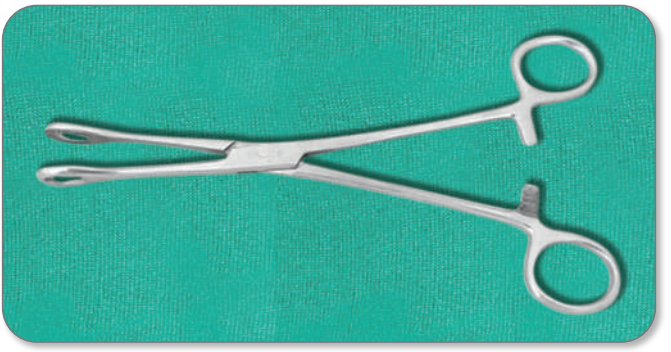
Indications/Uses

- This instrument is primarily used in inevitable and incomplete abortion to remove the conception products.
- It is used to remove an intact separated ovum.
- It is also used to evacuate the uterine content after dilation & curettage (D&C).
- It is also used to remove intrauterine contraceptive device (IUCD).

Point to Remember

Take care while using as it may cause tearing, hemorrhage, perforation and infection.

SPONGE-HOLDING FORCEPS



Background

This forceps was invented by David William Forester (1888–1937).

Description

- Sponge forceps is also known as sponge holding forceps.
- It is designed in scissors shape.
- It comprises ratcheted handles and looped, smooth or serrated jaws.
- The jaws are rounded and consists of elongated tips.
- It is of two types curved and straight.
- It measures about 18–23 cm in length.

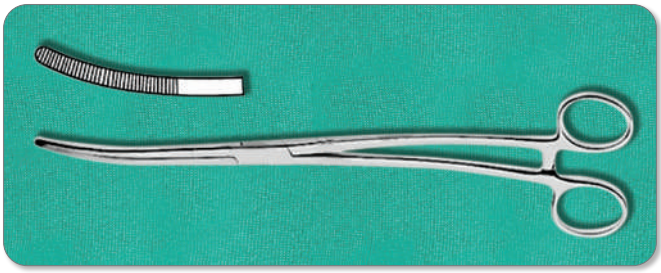
Indications/Uses

- This instrument is used for toileting the abdominal wall prior to cesarean section.
- This is also used for grasping the cervix in cerclage operation.
- It is also used in exploring cervix after forceps delivery.
- In lower (uterine) segment cesarean section (LSCS), this can be used as substitute of Green–Armytage forceps for clamping the bleeding edges.
- It is used for toileting the vulva, vagina and perineum prior to vaginal delivery.
- It is also used to catch hold of the cervix to inspect cervical tear.

Points to Remember

- While using sponge-holding forceps, firmly press it downward.
- This instrument is used for holding sponge or a gauze piece for painting the area before operation.
- This also helps during tissue dissection when used as sponge on holder.

UTERINE DRESSING FORCEPS



Background

In the 16th century in Germany, the dressing forceps were widely used among the barbers and surgeons. At that time, it was mostly used as a foreign body removing forceps.

Description

- It measures about 20 cm in length. It is a straight, right angled sideways, serrated jaw which is 8 × 25 mm.
- The shank of this instrument is curved and slightly visible inside the uterine.

Indications/Uses

- The common indications are—fetal distress in first stage, chronic pelvic disease (CPD) abnormal presentations like transverse lie, brow, breech in primi and previous two scars on the uterus.
- It is useful in swabbing the uterine cavity following dilation and evacuation.
- It is useful in dilating the cervix in lochiometra or pyometra.
- It is used to plug the uterine cavity with gauze twigs in continued bleeding after extraction of polyp.

Point to Remember

This forceps is used as a hemostat in cesarean operation.

LANE'S TISSUE FORCEPS

Background

Lane's tissue forceps was invented by Sir William Arbuthnot Lane (1856–1943), a British surgeon and physician.

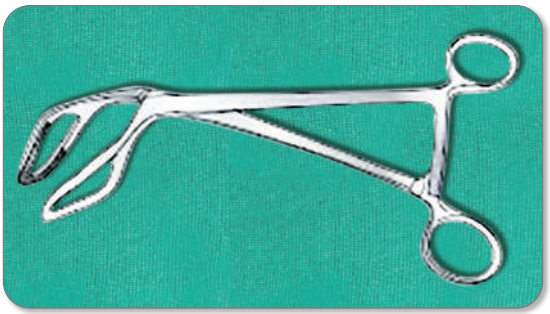
Description

- It is equipped with sharp teeth and wide gap between the blades. It measures about 16 cm in length.
- It is made of German stainless steel and is designed with cross-serrations—either 1 × 2 teeth or 2 × 3 teeth.
- The Lane tissue forceps is used for holding bulky, tough fascia and cartilage type tissue.
- The smooth, flat handle assures the grip along with sharp teeth.
- It is stout with wide gap between the blades.

Indications/Uses

- Sharp teeth and wide gaps between the blades aid in grasping and retracting the parietal wall in abdominal operations with transverse incision.
- To grasp the polyp or fibroid in polypectomy or myomectomy surgeries.
- During draping, it can be used to hold the towel.

UTERUS-HOLDING FORCEPS



Background

This instrument was introduced by Cullen of Baltimore, and later modified by George B Somers who was a San Francisco surgeon.

Description

- Uterine holding forceps are generally made with steel.
- The opposite end of the handle has a clamp which allows the tissue to be retrieved from the uterus/vaginal cavity.

Indications/Uses

- It is used to hold the fundus firmly and with the least possible injury.
- During the conservative surgeries of adnexae (uterine appendages), uterine-holding forceps are used to fix and steady the uterus.

MULTIPLE-TOOTHED VULSELLUM

Background

Vulsellum forceps has hooks at the tip of each blade and is often used in obstetrics and gynecology procedures.

Description

- It has multiple hooks at the tip of each blade, along with ratchet handle and sideways of blades are curved inward facing, double-pointed claws with ridges or serrated.
- Each pair of surgical forceps has hooks at the tip of each blade and are used to grasp the uterus or cervix during procedures.
- It measures about 18 cm in length.

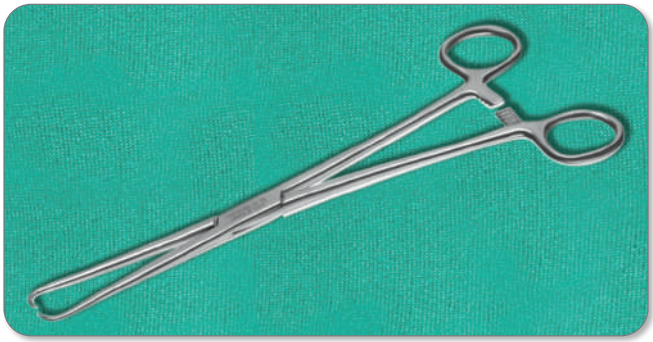
Indications/Uses

- Multiple-toothed vulsellum is useful in grasping the cervix, exclusively the anterior lip of the cervix.
- This long instrument is designed in such a way that the blades are gently curved to avoid the obstruction.
- The instrument aids in holding the cervix in position during procedures, like insertion of intrauterine contraceptive device, cervical biopsy, D&C, first trimester medically terminated pregnancy with suction evacuation, Fothergill's operation, vaginal hysterectomy.
- Posterior lip of the cervix is grasped in post colpotomy.
- It is contraindicated to use in pregnancy since the teeth of this instrument are sharp, it may cause perforation.
- Can be used as an alternative to sponge holding forceps.

Points to Remember

- Vulsellum forceps are most often used in obstetrics and gynecology.
- They produce trauma to the soft and vascular cervix.

SINGLE-TOOTHED VULSELLUM



Description

- Vulsellum forceps are used in obstetrics and gynecology.
- They measure about 23 cm in length and consists of single tooth at the tip of the blades and tooth is sharp in nature.

Indications/Uses

- To hold the cervix after opening the vault of vagina.
- To give traction during total abdominal hysterectomy.
- To hold new cervical stump after amputation of the cervix in Fothergill's operation.
- Utilized in hysteroscopy, laparoscopic chromoperturbation, hysterosalpingography.

Points to Remember

- Occasionally used to hold anterior lips of multiparous cervix in dilation and curettage procedures.
- As it is a straight instrument it has only single tooth for grasping the cervix.

GIANT VULSELLUM

Description

Giant vulsellum is used in destructive operation especially in evisceration to have a good grip of fetal parts for giving traction.

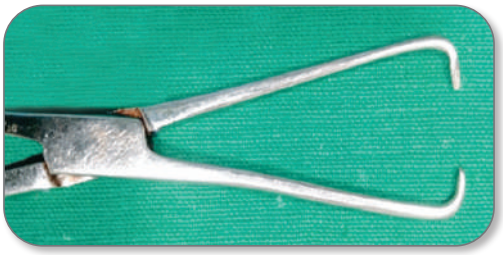
Indications/Uses

- To grasp or handle the anterior lip of the cervix.
- During vaginal operations, e.g., D&C and repair of prolapsed.
- To help in the correction of right ventricular failure (RVF).
- To grasp a prolapsed submucous myoma during a vaginal myomectomy.
- During a hysterectomy.

Points to Remember

- **Complications:**
  - Laceration of the cervix
  - Infections
  - Bleeding from the site of the bite of the teeth of the vulsellum
- **Contraindications:**
  - The soft pregnant cervix. However, you will use it in an incomplete abortion or cervical cerclage still there is a risk of bleeding.
  - Infections.

TENACULUM



Background

This instrument was invented by Dr Pozzi.

Description

- A tenaculum is a surgical instrument—a type of forceps.
- It consists of a slender sharp-pointed hook attached to a handle.

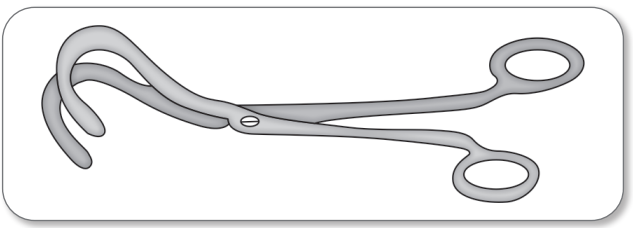
Indications/Uses

- It is used in the insertion of IUD to hold cervix and uterus. **For example:** Nulliparous cervix because two teeth can grip a much smaller area than the fine teeth of vulsellum.
- It is used in hysterosalpingogram (HSG), hysteroscopy and laparoscopic perturbation.

Points to Remember

- It is used mainly in surgery for seizing and holding parts, such as blood vessels.
- Recent research indicates that an Allis clamp may be better suited for the tasks done with tenaculum, as it is less likely to cause bleeding complications.

PYE-SMITH FORCEPS



Background

This instrument was invented by Dr Charles Pye-Smith (1896-1948). He was a Canadian surgeon.

Description

- It measures about 25–30 cm in length.
- Blades are in same direction.
- The position of the blade is serrated transversely and may have a central grove showing multiple lines.

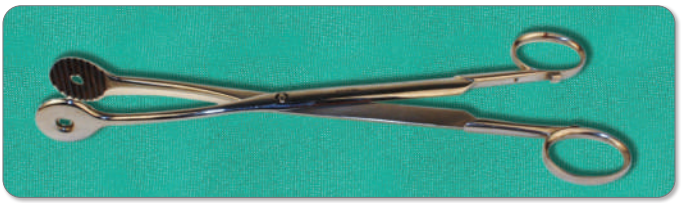
Indications/Uses

- To hold ruptured ovarian cysts.
- It is also used to close the wall of the cyst by the serrations on the inner side of the blades and thus prevents leakage of fluid from cyst.

Point to Remember

Use with caution in dermoid reactionary peritonitis and pseudomyxoma peritonei, as it may cause rupture.

NELATON'S CYST HOLDING FORCEPS



Background

This instrument was designed by Nelaton Krohne and Sesemann (1860–1900).

Description

- This instrument consists of two round blades with central fenestration and inner portion of the blade is transversely serrated.
- Each blade contains holes and nails, corresponding to the nails and holes in the other.

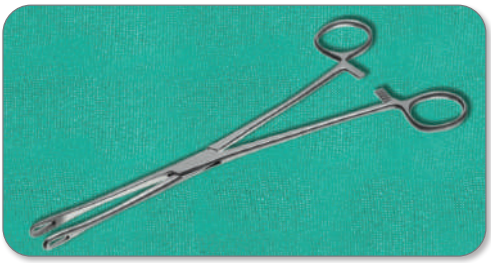
Indications/Uses

- To hold ovarian cyst before its identification of pedicle, clamping, cutting and ligating.

Points to Remember

- **Contraindication:**
  - It can never be used in a tense cystic wall.

UTERINE POLYP FORCEPS



Description

- The instrument consists of straight blade with the flat, oval-shaped fenestrated tip.
- It measures about 27 cm in length.

Indications/Uses

- It is used in removal of uterine polyp.
- It is also used for removal of uterine placental polyp.

UTERINE PACKING FORCEPS

Description

- It measures about 24 cm.
- It is a long, sinuously-curved instrument with 2 blades, with the transverse serrations on the inner surface of the blades so that firm grip is obtained.

Indications/Uses

- It is used in the uterine package in case of uncontrolled postpartum hemorrhage (PPH), postabortal hemorrhages.
- As a long, curved forceps it is used to grasp the uterus during a procedure.

Point to Remember

Uterine forceps have blunt serrations, and may be used to remove tissue or insert packing.

KELLY FORCEPS

Background

This instrument was invented by Howard Atwood Kelly.

Description

- It is 14 cm in length.
- It is available as curved and straight with ratcheted finger ring handle.
- The jaws of Kelly's forceps are 1/3 of the length and shanks and separations are 1/2 of the length of the jaws.

Indications/Uses

- It is used in clamping large blood vessels on manipulative heavy tissue.
- It is also used for the soft tissue dissection.

Point to Remember

This instrument can be used as a clamp, heat sink or third hand.

CHEATLE FORCEPS

Background

This instrument was invented by Sir George Lenthal Cheatle (1855–1951). He was a British surgeon.

Description

- It is a traumatic clamp with wide ends and triangular tips which have transverse ridges on the inner surface.
- The forceps are available in straight and curved shape.
- The length of the instrument is 8¼ inches.

Indications/Uses

- It is used to cut the edge of the lower segment after delivery of fetus.
- It is used to grasp and clamp tissue in the uterus
- It is also used in place of sponge-holding forceps for tracing cervical tears.

Points to Remember

- They are used to ensure that as each item is removed, others are not infected.
- The forceps are placed in a container of methylated spirits when not in use.
- Both forceps and container would be sterilized in boiling water at the start of each operation.