

Instruments

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Part 1: Metallic instruments

Parts of a forceps



Babcock's tissue holding forceps



How you identified this instrument?

- This is a light instrument
- The terminal part of the blades are curved and fenestrated
- The tip is provided with a ridge in one blade and groove in the other
- When the ratchet is closed, the ridge in one blade fits in groove of the other blade
- There are no teeth in the forceps (so it is a non-traumatic instrument).

What is the purpose of using this instrument?

To hold soft tissue (like intestine).

In which surgeries, this instrument is used?

1. Appendicectomy
2. Small and large bowel resection anastomosis
3. Gastrotomy/ jejunostomy
4. Suprapubic cystolithotomy.

In appendicectomy, how many Babcock's tissue forceps are needed?

3 pairs: for holding the appendix at tip, body and base.

How will you sterilize this instrument?

By autoclaving.

Allis tissue forceps



How you identified this instrument?

- This is a light instrument
- The blades are longer
- There is a gap between the blades
- The tips of the blades are provided with sharp teeth with grooves in between

- When the ratchet is closed, the teeth of the one blade fits in the groove of the other blade.

Tell some common uses of this instrument?

1. During laparotomy using midline incision:
 - I. To retract the skin margins by applying this forceps to the skin margins when linea alba is incised
 - II. To hold the linea alba by this forceps during suturing the midline incision.
2. To hold skin margins during incisional hernia to raise skin flaps.

Straight hemostatic forceps



How you identified this instrument?

- This is a light instrument
- It has 4 parts: finger bows, ratchet, a pair of shaft and a pair of blades
- The blades are usually half the length of the shaft
- The full length of the blades are provided with transverse serrations
- The tips are conical and non-toothed
- When the ratchet is closed, the blades are apposed.

What are the types of hemostatic forceps?

1. Straight
2. Curved.

What is the purpose of using this instrument?

This instrument is used in all operations to hold the bleeding vessels while cutting through different layers of tissues.

Tell some common uses of this instrument (although it is used in all operations)?

1. While making abdominal incisions and closing abdominal incisions, hemostatic forceps is used to hold the cut margins of rectus sheath, linea alba, external oblique aponeurosis and surgical peritoneum.
2. During appendicectomy, it may be used to:
 - I. Split internal oblique and transversus abdominis
 - II. To crush the base of appendix.

Can you hold the bowel by this instrument?

No, bowel can't be hold by straight hemostatic forceps because it will crush the bowel as bowel is softer tissue. It may be used to hold tougher tissues.

What are the ways of controlling bleeding during surgery?

1. Simple pressure
2. Crushing of the bleeding point
3. Electrocautery
4. Ligature.

How will you sterilize this instrument?

By autoclaving.

Needle holder



How you identified this instrument?

- There are criss-cross serrations in the blade.
- There is a longitudinal groove in the center of the criss-cross serration which allows firm gripping of the needle.

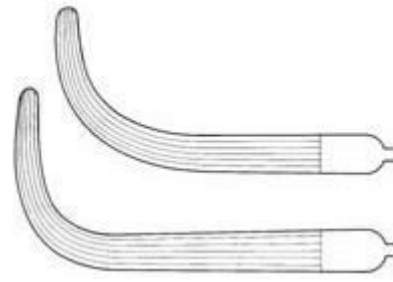
How you differentiated this instrument from a straight hemostatic forceps?

<i>Straight hemostatic forceps</i>	<i>Needle holder</i>
Lighter instrument	Relatively heavier instrument
Blades are longer	Blades are smaller
There are transverse serrations in the blade	There are criss-cross serrations in the blade
There is no groove at the center of the blade	There may be a groove at the center of the blade

What is the use of this instrument in surgery?

It is used to hold needle for suturing in all operations.

Moynihan's cholecystectomy forceps



How you identified this instrument?

- This is a stout and heavy instrument
- There are a pair of relatively long shafts
- Blades:
 - ✓ Relatively short
 - ✓ Slightly angled to the shaft
 - ✓ With blunt tips
 - ✓ Having transverse serrations.

How many of this instrument is needed in cholecystectomy?

2 ± 1

How this instrument is used during cholecystectomy?

- One pair of forceps is used to hold the fundus of gallbladder
- One pair of forceps is used to hold near Hartmann's pouch (neck)
- One additional pair of forceps may be used to hold the body of gallbladder if the gallbladder is long.

How will you sterilize this instrument?

By autoclaving.

Ramsey's swab holding forceps



How you identified this instrument?

- This is a long instrument
- The instrument is provided with a pair of finger bows, a pair of long shaft, ratchet, a joint and a pair of blades
- The blades are oval in shape, fenestrated and provided with serrations in the inner aspect.

Name some common uses of this instrument.

1. Cleansing the skin before all operations with an antiseptic solution
2. To clean the blood with a swab during dissection of Calot's triangle during cholecystectomy
3. Mopping of deeper tissues during surgery.

Tooth dissecting forceps



How you identified this instrument?

- There are 2 shaft with a blade
- There is a tooth at the tooth of one blade
- There is a groove at the tooth of the other blade
- When the blades are approximated, the toothed tip fits into the groove.

How you differentiated it from plain dissecting forceps?

As plain dissecting forceps don't contain tooth.

Tell some common uses of this instrument?

1. Used in almost all operations to hold tough structures like skin, fascia and aponeurosis
2. To hold cut skin margins during suturing
3. To hold linea alba/ rectus sheath during closure of the abdominal incision.

Lagenbach's single blade retractor



How you identified this instrument?

- The instrument has a handle, a long shaft and a flat solid blade
- The blade is curved at right angle to the shaft
- The tip of the blade is curved at right angle for better retraction of tissue.

What is the use of this instrument?

Suitable placed retractors help in better visualization of the operative field.

Name some other retractors you know.

1. Czerney's retractor
2. Doyne's retractor
3. Morris's retractor.

Mayo's towel clip



How you identified the instrument?

- The instrument is provided with a pair of finger bows, a ratchet, a pair of shaft, a joint and a pair of blades
- Blade is curved and tip of the blade is sharp and pointed.

Name some common uses of this instrument.

1. Draping of surgical site
2. Catch hold of towel
3. Catch hold of tongue in tongue surgery.

What is draping?

Draping is suitable placement of sheets to isolate the area of operation from the rest of the body. It reduces contamination of the surgical site from adjacent skin areas.

Kelly's rectal speculum (Proctoscope)



Describe the instrument.

- This is a 3 inch long metallic instrument with a hollow outer sheath where a handle is attached. The terminal end of the sheath is round/ obliquely cut.
- The inner rod is called *obturator*. Its terminal part is smooth and rounded and fits well with the outer sheath.

Name some common uses of this instrument.

- Diagnostic use:
In the diagnosis of:
 1. Piles
 2. Perianal fistula
 3. Anal/ rectal polyp
 4. CA anal canal/ rectum

5. Ulcerative colitis.
- Therapeutic use:
 1. Injection sclerotherapy of piles
 2. Polypectomy
 3. Biopsy from a rectal/ anal growth.

Part 2: Non-metallic instruments

Kehr's T tube



How you identified this instrument?

- There is a short horizontal limb (which is inserted into the bile duct)
- There is a long vertical limb (which is brought outside).

What is the significance of the green line on T tube?

It is made of a radio-opaque substance so that its position can be visualized radiologically.

Name some common uses of this instrument.

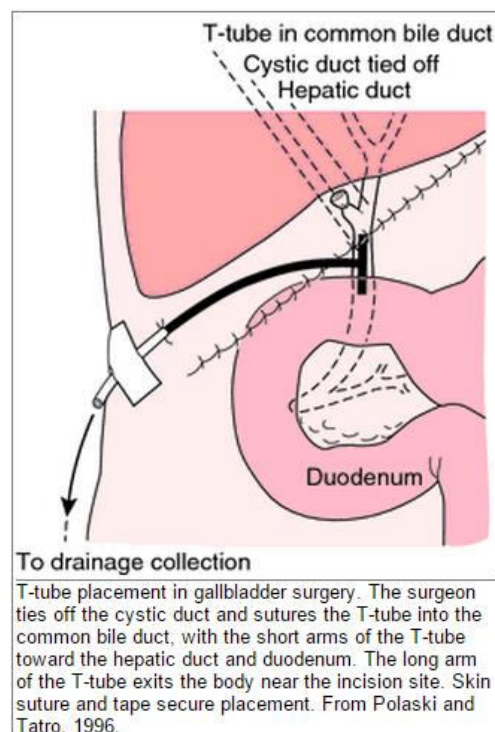
- After choledochotomy (CBD exploration), the bile duct is closed over a T-tube (as primary closure of bile duct is associated with higher incidence of leakage).
- To drain bile duct after repair of bile duct injury (in this case, T tube acts as a stent and kept in place for 4-6 weeks).

Do you know the dimensions of CBD?

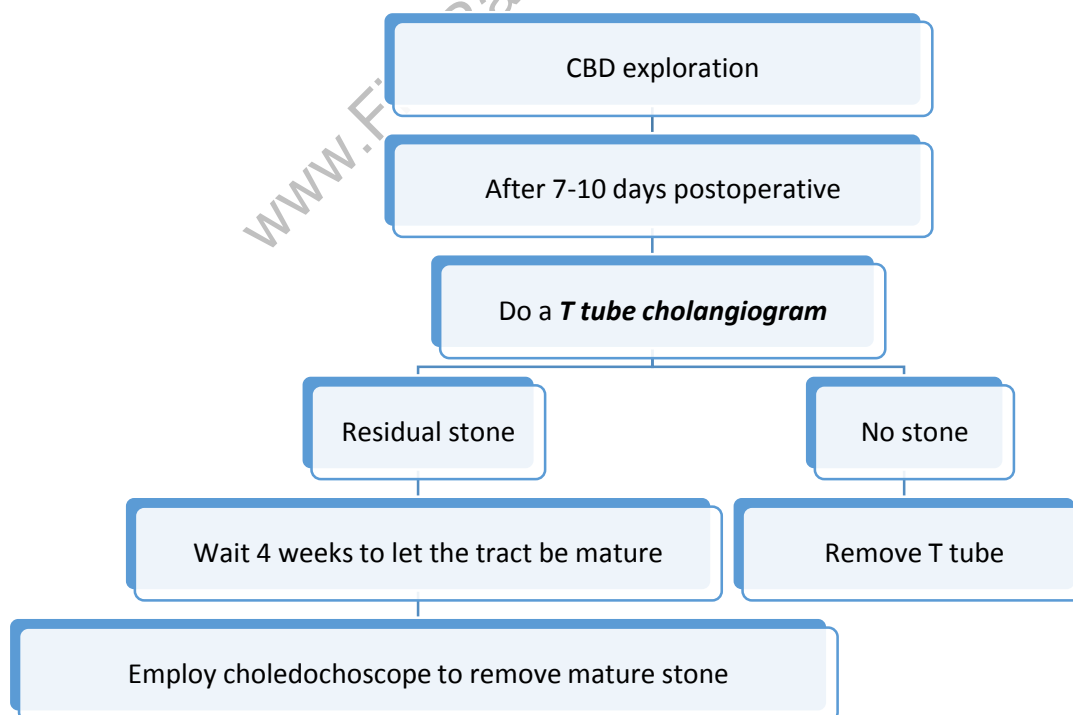
- Length of CBD: 6-7 cm.
- Caliber of CBD: 6-9 mm.

How T tube is inserted?

- The short limb is cut to a desired length
- The limb passing towards the lower end of bile duct is kept about 3-4 cm
- The limb passing towards the hepatic duct is kept about 2-3 cm
- A slit is made in the short limb so that 2 openings are connected by the slit
- A rim of the tube is cut away along the slit made
- The short limb is then inserted into the bile duct
- The choledochotomy (incision into CBD) is then closed with interrupted sutures so that the T tube fits snugly into the bile duct.



Describe the treatment protocol in brief after placement of a T-tube (after CBD exploration).



How will you confirm the removal of T tube?

- Clamp the T-tube, after 10-14 postoperative days and observe 48 hours for development of pain, jaundice and fever
- Confirm free flow of dye in T-tube cholangiogram.

Name some methods to remove retained CBD stones?

1. **ERCP** and stone removal in 3 weeks
2. **Flushing** of heparinized saline/ bile acid through the T-tube
3. **Burhenne technique (also asked separately in viva)**: After 6 weeks once T-tube track gets matured; using Dormia basket/ choledochoscope, stone is removed through T-tube track under fluoroscopic guidance.
4. **ESWL** with endoscopic sphincterotomy/extraction/ lavage/stenting
5. Through **percutaneous transhepatic route**, cholangioscope is passed and CBD is visualised, stone is identified and removed using Dormia basket.

How will you sterilize a T tube?

Usually a T tube comes in a pre-sterilized pack. A used T tube may be sterilized using:

- γ -radiation or
- Ethylene oxide.

Corrugated rubber sheet drain



Identify the instrument.

It is a corrugated rubber sheet drain made up of Indian latex rubber impregnated with radio-opaque substance.

Tell some uses of this instrument.

1. As a drain to drain blood/ pus/ bile following some operations
2. Following cholecystectomy, the drain is placed in subhepatic space and Hepatorenal pouch of Morrison
3. Following repair of peptic perforation, the drain is placed in Hepatorenal pouch of Morrison.

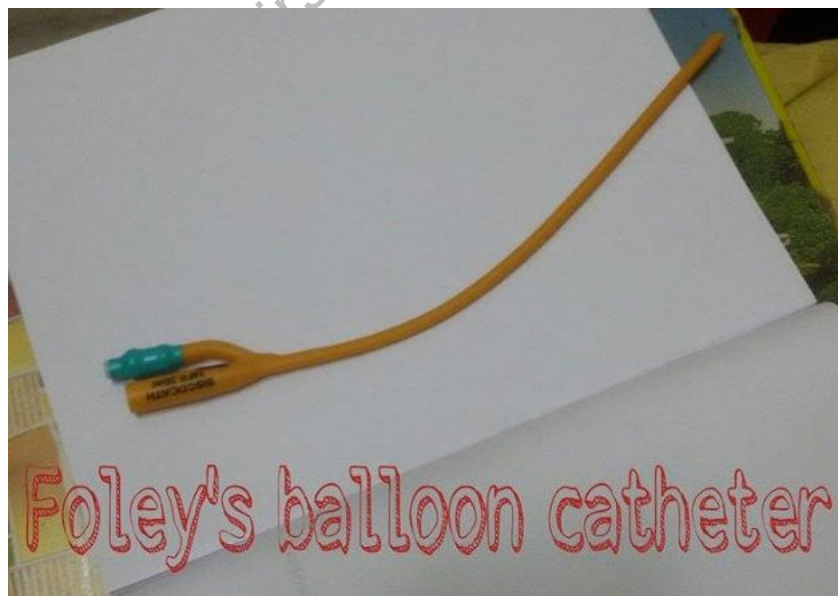
Sterilization:

By autoclaving.

Mention the temperature, pressure and time for autoclaving.

- Temperature: 121°C
- Pressure: 15 Pound
- Time:
 - ✓ For metallic instruments: 30 min
 - ✓ For non-metallic instruments (Ex: rubber): 15 min.

Self-retaining Foley's catheter



Describe the instrument.

- It is a 2 way self-retaining Foley's balloon catheter.
- The side channel is used to inflate the balloon (by distill water) so that it remains in place (blocked at the neck of bladder).
- There is a valve in the side channel.
- The main channel is for drainage of urine.
- The catheter number (no.14/ no.16) and balloon capacity (30-50 mL) is mentioned in main/ side channel.

Mention some of the common uses of this instrument.

1. For relief of retention of urine by urethral catheterization
2. Suprapubic cystostomy
3. Tube nephrostomy
4. Urethral catheterization following urethroplasty/ open prostatectomy.

Mention some other unusual uses of Foley's catheter.

1. Feeding jejunostomy
2. Drainage of abscess cavity
3. Control of epistaxis.