Surgery Instruments
khaled khalilia
Group 7

- Hand-grip: This grip is best for initial incisions and larger cuts.
- Pen-grip: used for more precise cuts with smaller blades.
- Changing Blade with Hemostat

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Scissors:

Here are two types of scissors used in surgeries. (zirconia/ceramic, nitinol/titanium)

- **Ring scissors** look much like standard utility scissors with two finger loops.
- **Spring scissors** are small scissors used mostly in eye surgery or microsurgery.

Bandage scissors:

Bandage scissors are angled tip scissors, helps in cutting bandages without gouging the skin.

- To size bandages and dressings.
- To cut through medical gauze.
- To cut through bandages already in place.
Tenotomy Scissors:

- used to perform delicate surgery. Used to cut small tissues.
- They can be straight or curved, and blunt or sharp, depending upon necessity.
- Operations in ophthalmic surgery or in neurosurgery. 10 cm

Metzenbaum scissors:

- Designed for cutting delicate tissue.
- Come in variable lengths and have a relatively long shank-to-blade ratio.
- Blades can be curved or straight.
- The most commonly used scissors for cutting tissue.
- Use: ental, obstetrical, gynecological, dermatological, ophthalmological.
**Forceps:**

- **Dissecting forceps (Anatomical)**
  - With teeth: for tougher(hart) tissue: Fascia, Skin

**Tools for hemostasis:**

**Artery Forceps (Haemostats, Pean):**

- used in almost any surgical procedure, usually to control bleeding.
- with it he could clamp the bleeding vessel before securing it with a ligature.
- The jaws compress the tissue instead of cutting it as scissors do.
- The handles are 4 or more times longer than the jaws to give a very high pressure on the tissues.

**Kocher Forceps:**

- wird vorwiegend dann eingesetzt, wenn Strukturen sicher gefasst und längerfristig festgehalten werden.
- einen kleinen „Zahn“ am Ende, der ein Abrutschen der Klemme auch dann verhindern kann.
- Standardfassinstrument bei robusten Gewebetypen wie Knochenhaut und Haut eingesetzt; durchtrennte Muskelfasern.
- A Kocher is used to grasp heavy tissue.
- May also be used as a clamp.
- The jaws may be straight or curved.
- Other names: Ochsner
Mickulick Forceps:
- a clamp to hold the peritoneum.

Mosquito forceps (Halsted):
- Mosquitoes are used to retract in small fields, hold delicate tissue, and compress bleeding vessels.
- A forceps with slender jaws for grasping arteries and other blood vessels
- Its jaws may be straight or curved

Bulldog, Dieffenbach:
- For temporary occlusion of vessels during vascular surgery.
Statinsky (vascular forceps):

Overholt-Barraya:

Guyon forceps:

T-forceps
Babcock

- A Babcock is used to grasp delicate tissue (intestine, fallopian tube, ovary).
- Available in short and long sizes.

Allis:

- An Allis is used to grasp tissue.
- Available in short and long sizes
- A "Judd-Allis" holds intestinal tissue.
- A "heavy allis" holds breast tissue

Debakey Vascular Clamp:
- The most standard of vascular clamps
- The jaw of
- The clamp is designed to clamp veins and arteries without causing damage.
Museux Tenaculum Forceps:

- is used in OB/GYN practices by Gynecologist and Obstetricians.
- High Grade Stainless Steel is used in its production to insure durability and precise working for long time.

intestinal clamp forceps:
Lovelace:

Forester:

Chaput-poirier:

Compress Holder:
Towel holding forceps:

- are used to maintain surgical towels and drapes in the correct position during an operation.
- The beak may be pointed or blunt and flat.
- An important type of towel clamp forceps is Backhaus towel clamp which is a kind of locking forceps with curved, pointed tips.
- can be recovered, autoclaved or sterilized, and reused.
- are used to connect toweling which drapes or covers those regions of a surgical patient's anatomy which are not exposed during the surgical procedure.

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Needle Holder:

- used by Doctors and Surgeons to hold a suturing needle for closing wounds during suturing and surgical producers.
- Also called needle forceps.
- Most needle holders also have a clamp mechanism that locks the needle in place, allowing the user to maneuver the needle through various tissues.
Mathiu: schnelleren, leichteren Handhabung. Bei Nähten, die häufiges Umgreifen erfordern (fortlaufende Nähte, Anastomosen etc.), lässt sich ein Zeitgewinn mit geringerem Krafteinsatz erzielen.

Mayo/Olsen-Hegar:
- Der relativ lange, schlanke Nadelhalter gewährleistet sichere Führung der Nadel ohne die Sicht auf das Operationsfeld einzuschränken.
- Hegar als gynäkologischer Operateur, benötigte einen Nadelhalter zum Operieren in der Tiefe bei relativ geringer Öffnung des Operationsfeldes.

Needles:
- most surgical needles are curved. A few are straight.
- The curve allows the needle to pass down into the tissues and to come out again along a curved track.
- The simplest surgical needles are basically round bodied so that they pass through the tissues without cutting.
- Cutting needles, as the name suggests, cut through tough tissues.
- Needles are made from steel alloys, selected to hold a very sharp point for once only use.
- a surgical needle has the suture embedded in its blunt end.
Deschamps needle: A needle with a long shaft for passing sutures in the deep tissues.

Reverdin: A Reverdin needle is used to make a sharp vertical puncture.

Clips and Clips applying forceps:

Michel applying forceps
Michel clips:

- is a way of closing skin with sutures made of stainless steel.
- This secures the tissues together and forms a bond.
- The Michel clip can be utilized to provide closure of tissue and to stop bleeding in surgical procedures.
- Studies have shown that the incidence of inflammation, or swelling and redness surrounding the wound is slightly higher when using the Michel clip.
- The Michel clip had a decrease cosmetic appearance. This decrease continued through the clip’s use and immediately following removal.
- These skin sutures are applied using a specialized tool called the Michel suture clip application forceps. These stainless steel instruments resemble a pair of tweezers and can also be used to remove sutures.

Needle:

- aneurysm needle one with a handle, used in ligating blood vessels.
- aspirating needle a long, hollow needle for removing fluid from a cavity.
- cataract needle one used in removing a cataract.
- discission needle a special form of cataract needle.
- hypodermic needle a short, slender, hollow needle, used in injecting drugs beneath the skin.
- stop needle one with a shoulder that prevents too deep penetration.
- transseptal needle one used to puncture the interatrial septum in transseptal catheterization.
- atraumatic needle an eyeless surgical needle with the suture attached to a hollow end.
- knife needle a slender knife with a needle-like point, used in ophthalmic operations.
Retractors:

- Retracting is one of the commonest functions of the assistant.
- RETRACTING means holding the tissues so that the surgeon can see and work in the operating area.
- The assistant's handling of retractors will have a big influence on the success of an operation as well.
- The assistant uses the retractor with a mixture of **pulling**, **static holding** and **angling**.

**Kelly Retractor:**

- Medical Tools Retractors used by surgeons to either actively separate the edges of a surgical incision or wound, or can hold back underlying organs and tissues, so that body parts under the incision may be accessed.
- The Kelly retractor is a typical abdominal retractor.
- Its wide deep blade will hold back the intra-abdominal organs.
- This retaining action is helped by placing abdominal packs between the organs and the retractor.
- The angle between the blade and the handle is less than 90° to accentuate the retraction effect at the tip of the blade.

**St Mark’s retractor:**

- is similar to a Kelly retractor, but has has an even longer blade..
- This blade, with a lip, is extremely useful in the depths of the pelvis in an anterior resection of rectum.

**Kelly Retractor:**

![Kelly Retractor](image1)

**St Mark’s retractor:**

![St Mark's retractor](image2)
### IV. RETRACTING and EXPOSING INSTRUMENTS

Retracting and exposing instruments are used to hold back or retract organs or tissue to gain exposure to the operative site. They are either “self-retaining” (stay open on their own) or “manual” (held by hand). When identifying retractors, look at the blade, not the handle.

<table>
<thead>
<tr>
<th>Instruments</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deaver retractor</td>
<td>A Deaver retractor (manual) is used to retract deep abdominal or chest incisions. Available in various widths.</td>
</tr>
<tr>
<td>Richardson retractor</td>
<td>A Richardson retractor (manual) is used to retract deep abdominal or chest incisions.</td>
</tr>
<tr>
<td>Army Navy retractor</td>
<td>An Army-Navy retractor (manual) is used to retract shallow or superficial incisions. Other names: USA, US Army.</td>
</tr>
<tr>
<td>Goulet</td>
<td>A goulet (manual) is used to retract shallow or superficial incisions.</td>
</tr>
<tr>
<td>Malleable or ribbon retractor</td>
<td>A malleable or ribbon retractor (manual) is used to retract deep wounds. May be bent to various shapes.</td>
</tr>
<tr>
<td>Weitlaner retractor</td>
<td>A Weitlaner retractor (self-retaining) is used to retract shallow incisions.</td>
</tr>
<tr>
<td><strong>Gelpi retractor</strong></td>
<td>A <strong>Gelpi retractor</strong> (self-retaining) is used to retract shallow incisions.</td>
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</tr>
<tr>
<td><strong>Balfour</strong></td>
<td>A <strong>Balfour with bladder blade</strong> (self-retaining) is used to retract wound edges during deep abdominal procedures.</td>
</tr>
<tr>
<td><strong>Baby Bennette Retractor</strong></td>
<td>Elevating and Retracting Bone. Commonly in the minor orthopedic instrument set.</td>
</tr>
</tbody>
</table>

V. **SUCTIONING**
- Suctioning of blood and other secretions during surgery.

<table>
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<tr>
<td><strong>Frazier Suction Tip</strong></td>
<td>Suction tip commonly use for orthopedic, neuro and ENT surgery.</td>
</tr>
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</table>
Fixed Retractors:

**Balfour retractor:**

- This retractor is ideal for creating exposure for gastric surgery (especially gastropexy) as well as surgery of the liver and ruptured diaphragm repair.
- This modified version allows both arms to be removed from the cross piece, making it small enough to fit easily into a small autoclave.
- The traditional Balfour retractor is an ideal instrument for this application in theory, but its practical application is limited by the fact that it is simply too large to fit in the typical benchtop autoclave found in general practice.
- Exploratory surgery of the cranial abdomen in larger dogs presents difficulties of access for all surgeons, but especially when a scrubbed assistant is unavailable.

**Gosset Retractor:**

- A self-retaining retractor suitable for exposure of abdominal viscera. Two retractor blades are mounted on a bar and can be moved apart to open the incision. The blades are the standard P shape with a curved loop to provide retention.
Finochietto retractor:

- The Finochietto retractor is one of the biggest abdominal retractors.
- The opening mechanism on a Finochietto retractor is strong enough to prize apart the walls of the abdomen or the chest.
- Nevertheless, a large abdominal incision may need two Finochietto retractors inserted end to end.
Weitlaner Retractor:

- a self-retaining instrument, shaped like a scissors but the blades open when the ratcheted handles are closed. The blades each have four downward-pointing, curved prongs which retain their position in a spread wound.

Percy Retractor

Fracture site and damaged periosteum

Ankle, not heel, on bolsters

foot

fibula

knee

Peroneal tendons
Other Retractors:

Vaginal Speculum:

- A weighted speculum is placed in the vagina during vaginal surgery with the patient in the lithotomy position. The weight holds the speculum in place and frees the surgeon's hands for other tasks.
- The vaginal speculum is commonly used to hold the walls of the vagina apart so that a doctor or medical professional can examine the inside of a woman's vagina as well as her cervix.
- The speculum also enables the medical professional to take a pap smear or perform surgery.

Rectal Speculum:

- the use of a rectal speculum include detecting the presence of hemorrhoids, tumors, polyps, inflammation, intestinal bleeding, and anal fissures, conducting biopsies, and removing hemorrhoids.
- The speculum is typically a rigid tube or a set of blades that pushes the walls of the rectum apart so a physician can view the canal with direct vision.
- A rectal speculum may also be used for hemorrhoid ligation. A hemorrhoid is a swollen vein in the rectum or anus. After the patient is locally anesthetized, the procedure begins by placing an anoscope or proctoscope in the rectum.
Catheter:

Pezzer Catheter:
Malecot catheter:

- A Malecot catheter is a tube which is designed to be used for temporary drainage in the wake of a medical procedure or medical issue such as incontinence or kidney stones.
- Malecot catheters are distinguished by a winged design, with small wings on the end of the catheter which is inserted into the body.
- The wings stabilize the catheter and hold it in place, reducing the risk that it will slip or become dislodged.
- One common reason to insert a Malecot catheter is to provide drainage to the bladder or kidneys.
- In the case of a nephrostomy, an opening is created which allows urine to drain from the kidneys to the skin, via the Malecot catheter, with the end of the catheter commonly being attached to a bag to catch the urine.
- The catheter can also be inserted into the urethra to drain the bladder, with the wings holding in place and the tube acting as a stent to keep the urethra open. This can help a patient pass a stone.
- Many Malecot catheters are designed to be left in place for up to a month, acting as a long term catheter.
- The area around the catheter needs to be kept clean, and a doctor needs to periodically check for signs that the catheter has shifted or that an infection is present.
- When it is time to remove a Malecot catheter, the removal technique varies, depending on the placement was performed. During removal, the area will be assessed to confirm that it is in good condition and is healing well. The patient will also need to follow some simple aftercare directions to take care of the site while it fully heals.
- Another option is in use as a feeding tube. Gastrostomy tubes, as they are known, are inserted into the stomach, allowing people to directly provide nutrition to a patient. A Malecot catheter may be used as a temporary feeding tube before a different type is installed.
Nelaton catheter:

- A flexible tube (catheter) used for the short term drainage of urine.
- Unlike the Foley catheter, the Nelaton catheter has no balloon on its tip and thus cannot stay in situ unaided.
- The Nelaton catheter can be inserted into the bladder via the urethra or a Mitrofanoff.
- Lubrication and local anaesthetic are optional.
- The most common use for a Nelaton catheter is Continent Intermittent Self Catheterization.
- Perfectly finished closed distal end for smooth & painless insertion.
- Provided with two side eyes for efficient drainage.
- Provided with funnel shaped color-coded connector at the proximal end.
- Available in male and female versions.
Sengstaken-Blakemore:

- What is a Sengstaken – Blakemore:

  **Sengstaken-Blakemore tube** is a 3 lumen tube - one lumen to inflate gastric balloon, a second lumen to inflate oesophageal balloon and a third lumen to aspirate gastric contents. There is no oesophageal suction port. This causes saliva to pool in the oesophagus and thus put patients at risk of aspiration. Commonly Minnesota tube is referred to as **Sengstaken-Blakemore tube**.

- **When to use Sb :**

  It is used in life threatening upper GI bleed from ruptured oesophageal/gastric varices when traditional treatment with band ligation or glue injection has failed or are not available. This is only temporary method to buy time for more definitive procedures to stop the bleeding.

- **Wht o you need before u start:**

  1. The SB tube is normally kept in freezer - it helps insertion by improved stiffness.
  2. Keep ready two bladder wash syringes for suctioning the oesophageal and gastric lumen, another bladder wash syringe for inflating the gastric balloon.
  3. Stout metal artery forceps for clamping the balloon ports.
  4. If oesophageal balloon needs to be inflated in addition to the gastric balloon - You will need:
     - A 50cc Luer Lock syringe
     - An adaptor whose conical end will fit into the oesophageal port and the Luer lock end will fit into the sphygmomanometer (the adaptor is available in the chest drain kit)
     - A three way valve
     - A sphygmomanometer with detachable arm cuff – to remove the BP cuff and fit the Luer lock end of the chest drain adaptor to fit there.

- **How to insert it:**

  1. Debate regarding optimal place for the procedure: Resus vs. theatre: anaesthetist prefers theatre.
  2. Patient in normal endoscopy position.
  3. Airway protection - in general, patients who require balloon tamponade to control variceal bleeding should also be intubated. However airway protection is particularly important in:
     - Encephalopathy
     - If Sao2<90%
     - Aspiration pneumonia
  4. Check the balloons by inflating air and checking for any leak.
  5. Smear plenty of KY gel and pass the tube through the mouth like an NG tube. It is kept in the freeze in theatres and Endoscopy unit to increase the stiffness. Sometimes because of the curled position in which it is stored makes it very difficult to insert like NGtube and a laryngoscope and Magill’s forceps may be needed to guide it past crico-pharyngeus.
  6. Once it has gone up to 45cm mark it’s tip is expected to lie in the gastric lumen - confirm by aspirating stomach content and checking pH – position to be checked later by portable CXR.
  7. Once you are sure the tip is in the stomach, inflate the gastric balloon by inflating it with 200ml of air (and put two artery forceps as clamp and also insert the pegs supplied with the tube) and gently tugging it. Some prefer to put contrast mixed water rather than air.
  8. It should slide for some length and then halt as it abuts against the GOJ – then push additional 50-100ml of air and pull the tube out to exert the pressure on the GOJ.
  9. For majority of patients this is enough to stop the variceal haemorrhage. However, oesophageal balloon will need to be inflated, if the bleeding continues in spite of the gastric balloon inflation.
  10. Clamp the tube in between air refills.
  11. Finally fix the tube and keep a record of the distance of the tip from the incisor teeth - normally around 30-35cm mark.
12. Initial success to control bleeding depends on
   - Operator experience
   - Concomitant therapy (Terlipressin and antibiotics)

**Aftercare and removal:**

1. Migration of gastric balloon in oesophagus can cause compression of trachea and respiratory distress. Keep a pair of scissors ready at the bedside in case of emergency – to cut the gastric balloon port to let the air escape
2. Instruction to suction both oesophageal and gastric lumen at intervals of 10 minutes increasing to 30 minutes and after stabilization hourly
3. Frequent oropharyngeal suction
4. Don’t forget antibiotic prophylaxis and continued terlipressin for at least 48hrs
5. Pressure in the oesophageal balloon to be relieved for 10 minutes every 2 hours to prevent pressure necrosis
6. Repeat endoscopy at 24 hours.
7. The **Sengstaken tube** should be removed in the endoscopy room
8. First deflate the oesophageal balloon, then take off the traction and finally remove the **tube**
9. Chance of rebleeding when balloon is deflated is up to 50%
10. On second endoscopy it should be much easier to band or inject glue as bleeding hopefully would be under control, failing which patient should be referred for urgent TIPSS.
11. Serious complication can occur up to 15-20%
   - Oesophageal ulceration
   - Aspiration pneumonia
Tiemann:
Foley catheter:

- A Foley catheter is a flexible tube that is often passed through the urethra and into the bladder.
- The tube has two separated channels, or lumens, running down its length.
- One lumen is open at both ends, and allows urine to drain out into a collection bag.
- The other lumen has a valve on the outside end and connects to a balloon at the tip; the balloon is inflated with sterile water when it lies inside the bladder, in order to stop it from slipping out.
- Foley catheters are commonly made from silicone rubber or natural rubber.
- A major problem with Foley catheters is that they have a tendency to contribute to urinary tract infections (UTI). This occurs because bacteria can travel up the catheters to the bladder where the urine can become infected. To combat this, the industry is moving to antiseptic coated catheters.
- An additional problem is that Foley catheters tend to become coated over time with a biofilm that can obstruct the drainage. This increases the amount of stagnant urine left in the bladder, which further contributes to the problem of urinary tract infections. When a Foley catheter becomes clogged, it must be flushed or replaced.

Urinary catheters are used to drain the bladder and if you have if you have:

- Urinary incontinence (leaking urine or being unable to control when you urinate)
- Urinary retention (being unable to empty your bladder when you need to)
- Surgery on the prostate or genitals
- Other medical conditions such as multiple sclerosis, spinal cord injury, or dementia
- Obstruction of the urethra by an anatomical condition that makes it difficult for you to urinate: prostate hypertrophy, prostate cancer, or narrowing of the urethra
- Collection of a sterile urine specimen for diagnostic purposes
- Nerve-related bladder dysfunction, such as after spinal trauma (A catheter can be inserted regularly to assist with urination.)
- Or when dr. demote is asking you to use it 😊

Complications of catheter use include:

- Allergy or sensitivity to latex
- Bladder stones
- Blood infections (septicemia)
- Blood in the urine (hematuria)
- Kidney damage (usually only with long-term, indwelling catheter use)
- Urethral injury
- Urinary tract or kidney infections

Sometimes urine can leak around the catheter. This may be caused by:

- Catheter that is blocked or that has a kink in it
- Catheter that is too small
- Bladder spasms
- Constipation
- The wrong balloon size
- Urinary tract infections

Foley Catheter Preparation
Keep the genital area clean. Switch to looser-fitting cotton clothing, and do not use chemical irritants in the genital area prior to having the catheter inserted.
2-3: One to drain the urine, the other for the balloon

the inflated balloon snugs up against the neck of the urethra, and keeps the tube from just sliding out.

One for the balloon, one to drain the urine, and the third for irrigating the bladder.

we treat patients with fungal bladder infections using drip irrigants of

nystatin or

Amphotericin B
Instruments  UMF CLASS 2015 😊

swab for collecting samples

suture as stated above the type
nelon

tube for drainage

t tube

vaginal speculum
CVC line set

Dressing pack

Insulin syringe and needle

Blood bottle

Introducer for intercostals tube
Elaton

Folley catheter

Pezzer

Endo tracheal tube dressing that is put on the stoma and then a bag connects onto it :) Nasogastric tube

Stoma bag stoma bag 1st part dressing that stays on the skin, to prevent irritation and breaking of skin as if you have to change the bag everytime it will cause soreness.....
Specimen for urine

Special thanks to eyad eldada and Jovy ong 4 uploading the fotos on umf clas 2015 and to Abir
4 giving the name of the instruments :}
1. Steam sterilization
2. Poupinel sterilization
3. Preparation of surgical instruments for sterilization
4. Drainage
5. Dressings
6. Preoperative colonic preparation
7. Preoperative skin preparation
8. Enema
9. Direct compatibility testing
10. Transfusion technique
11. Transfusion reactions and accidents
12. Pleural puncture: indications, requirements, technique
13. Venous puncture: indications, requirements, technique
14. Arterial puncture
15. Paracentesis: indications, requirements, technique
16. Intravenous injection, indications, requirements, technique
17. Intradermic injection, indications, requirements, technique
18. Subcutaneous injection, indications, requirements, technique
19. Intramuscular, indications, requirements, technique
20. Intrarterial injection, indications, requirements, technique
21. Injections: risks, complications
22. Perfusion: indications, requirements, technique
23. Infiltration local anaesthesia
24. Spinal anaesthesia: indications, requirements, technique
25. Nasogastric intubation: indications, requirements, technique
26. Urethreal catheterization: indications, requirements, technique
27. Stoma care
28. Incisions
29. Surgical hemostasis
30. Postoperative care

Conf. Dr. Gabriel Dimofte