Introduction into patient care in surgery

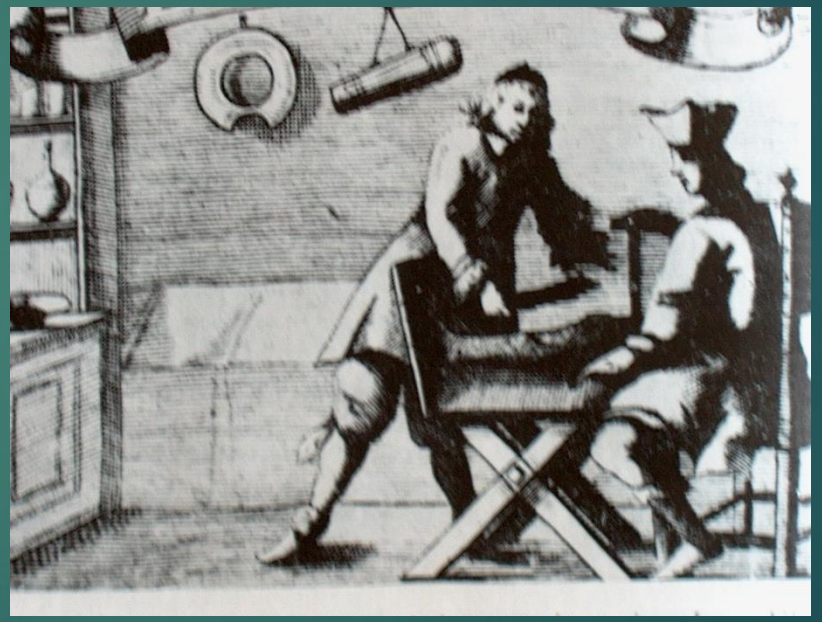
PAL ONDREJKA
PROFESSOR OF SURGERY

What does it mean to be a surgeon

- Long studies
- Lots of learning
- Even after finishing the university
- To be a specialist, you will need another 6 years
- Responsibility for the patients
- Responsibility for yourself
- Constant self education to be up-to-date in you field
- License examinations in every 5 years

The hystory of medicine

- The most ancient part of medicine is the surgery
- Missing anatomic knowledge
- Open wounds, bleeding, bone fracture
- 20-25 thousand years old findings



This means that the first „medical doctors" were „traumatologists"

- They had to treat injuries caused by hunting or wars

Com Ombo temple
Egypt

Com Ombo Temple
Egypt

Hystory of medicine

- Egyptian findings
- Figures on the walls of Com Ombo temple
- Detailed medical instruments


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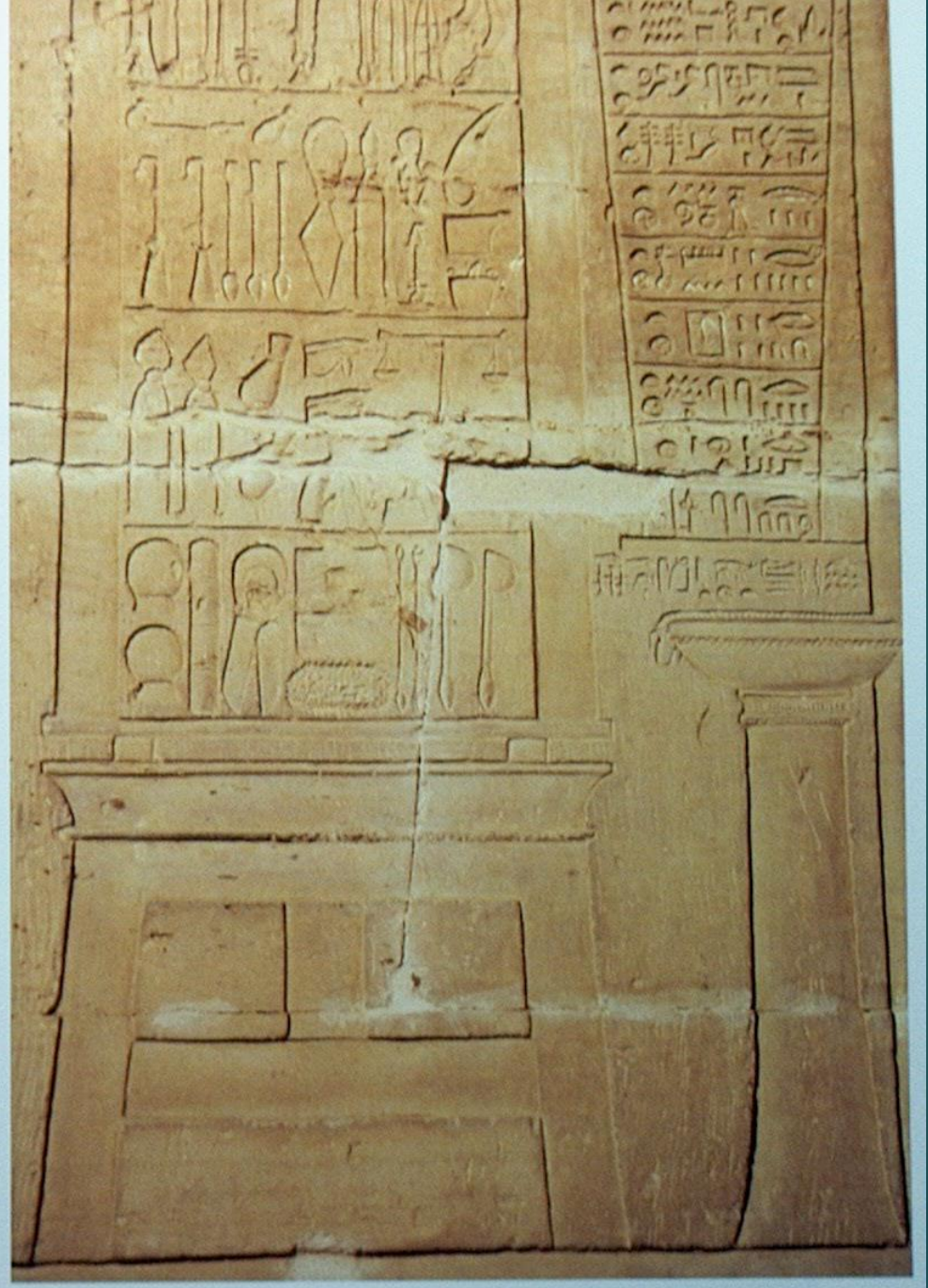
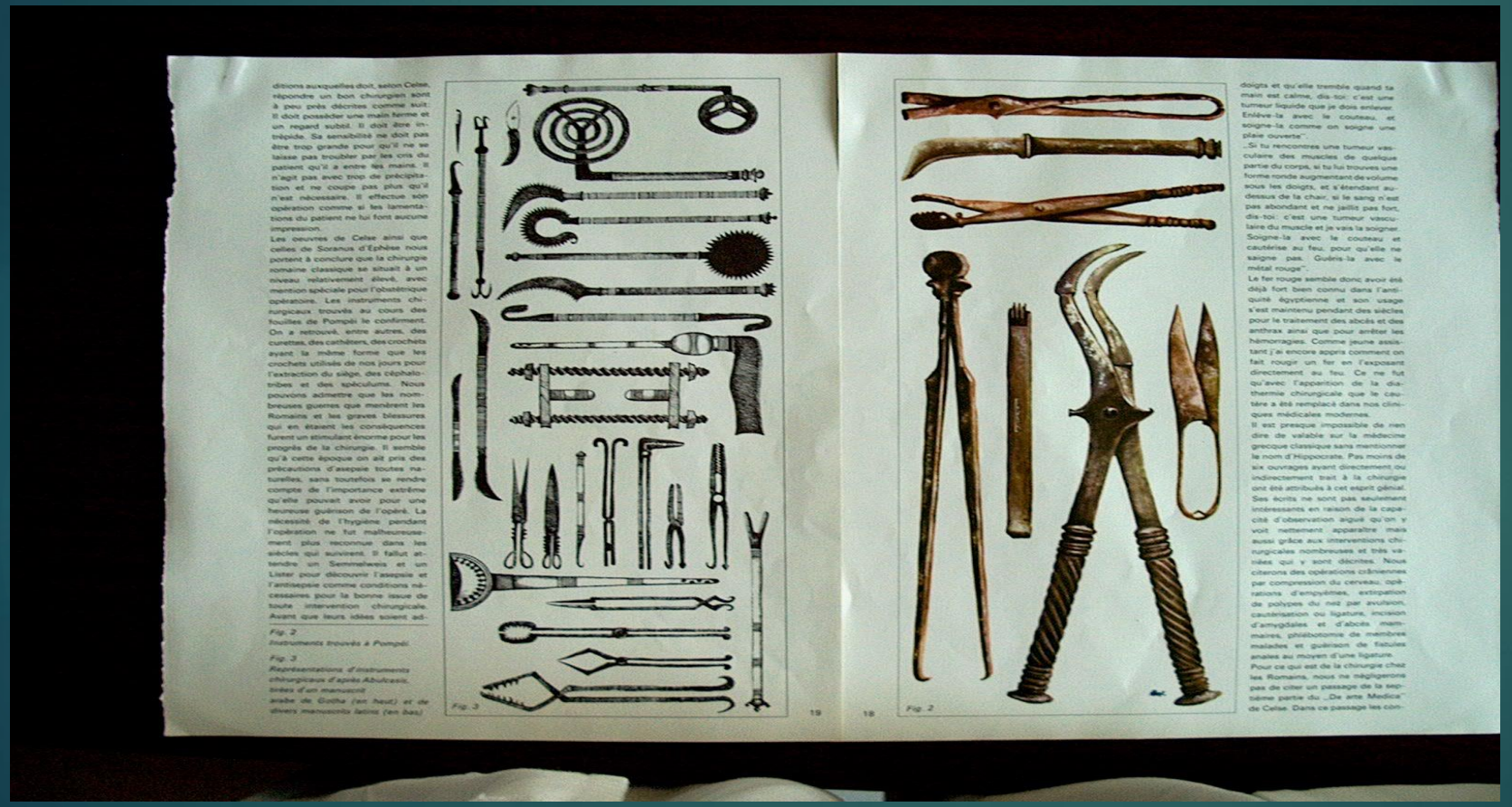
figure of Imhotep; on his lap he holds a scroll, a charac-



Surgical instrumentarium of an Egyptian physician. Wall relief

Medical instruments found under the ruins of Pompeii

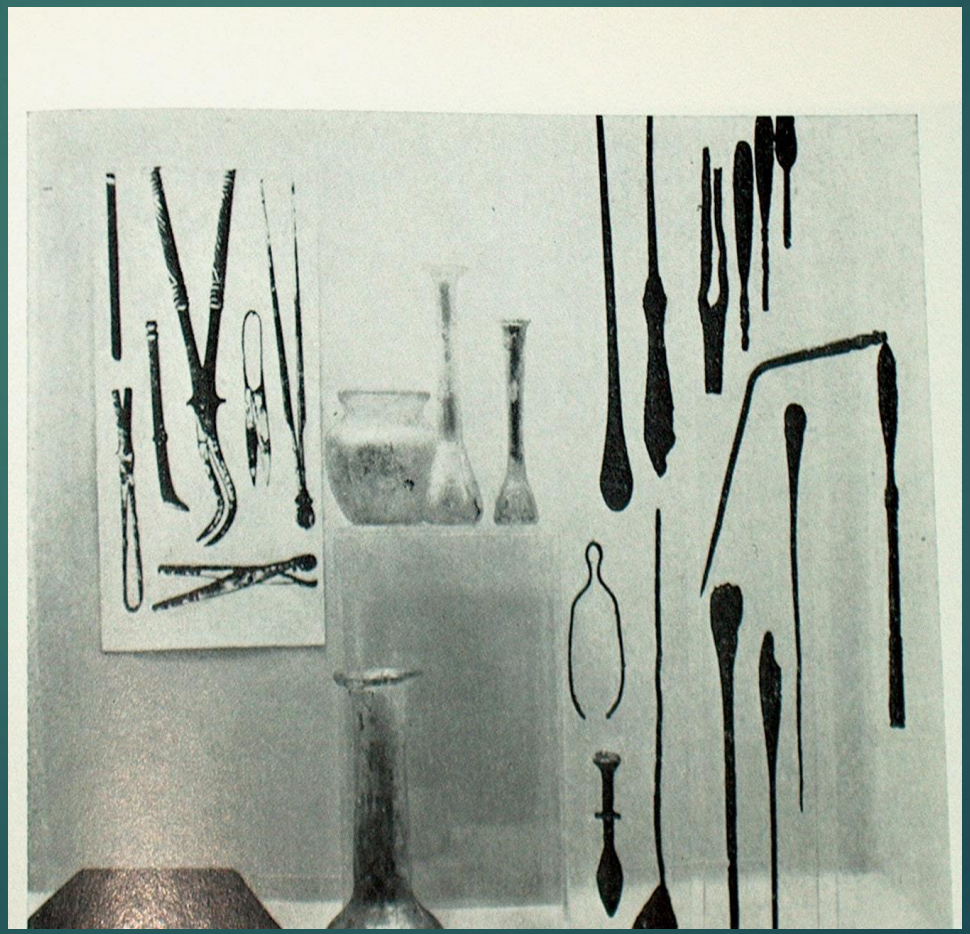


(Roman time, Explosion of Vesuvius in 79)

Roman surgical instruments, 1st-2nd century

Hystory of medicine

- **Medical instruments found in Aquincum, made of metal**



Hystory of medicine

- **Mezopotamia (B.c.. 18. century):**
- **Code of Hammurapi : Knife made of bronze, Bone fracture, principles**
- **Egipt: Edwin Smith papyrus 16th century BC: Description of 121 surgical instruments and 48 types of injuries**
- **India: Ayurveda 5000 yrs of experience: traction-antitraction in cases of bone fracture, enterostomy in case of ileus**

Hystory of medicine

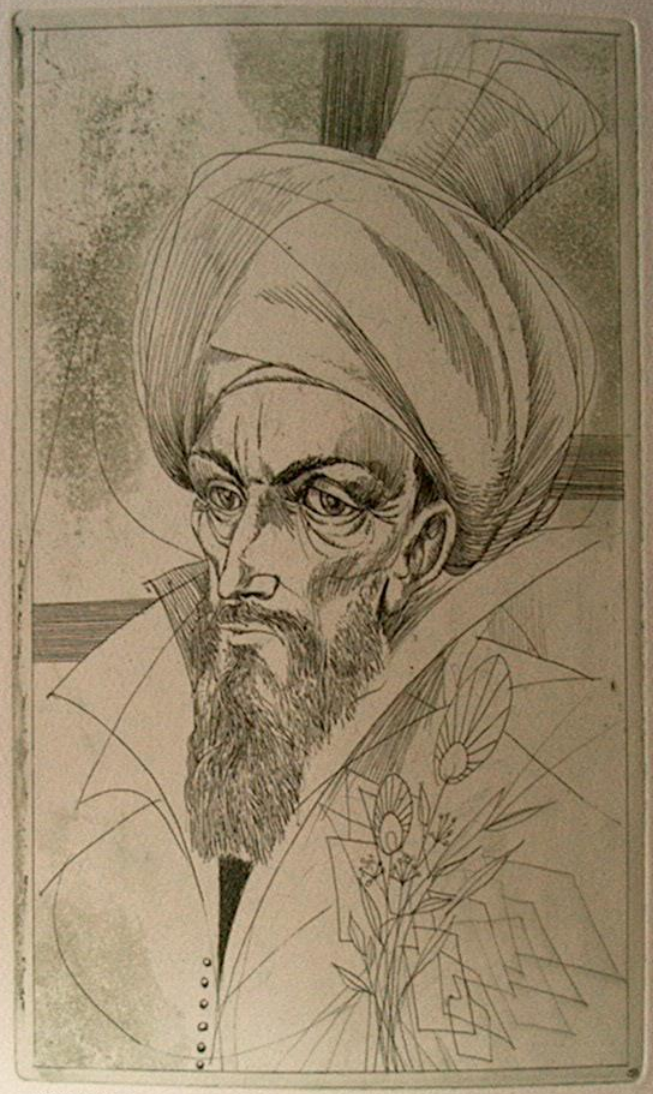
- **Greeks:** Hippokrates BC. 460-377: Medical school on Kos island: cleaning, suture of wounds, reposition of luxation of humerus, fistula ani, medical oath
- **Alexandria:** (BC.300- 400) **post mortem**, ligation of vessels

HYPPOCRATES

Roman legional hospital, 1st century

Hystory of medicine

- **Roman empire:**
  - **Celsus B.C. 14- 38): 8 volumes of encyclopedia**
  - **Galenus (129-199): From empiria to dogmas (evolution of medicine become slower)**
- **Persian medicine: Ibn Sina (980-1037) Avicenna: again empiria, but no post mortem**
- **European universities from the XI. century: Paris, Bologna, Oxford, Montpellier, Padua, Napoli, Prague, Wien, Heidelberg, Pecs (Hungary)**



AVICENNA *980 - 1037*

Hystory of medicine

- **Renaissance:**
  - Leonardo da Vinci (1452-1519) anatomical studies
  - Vesalius (1514-1564) De Humani Corporis Fabrica, anatomic studies
  - William Harvey (1578-1657) realised the circulation of blood

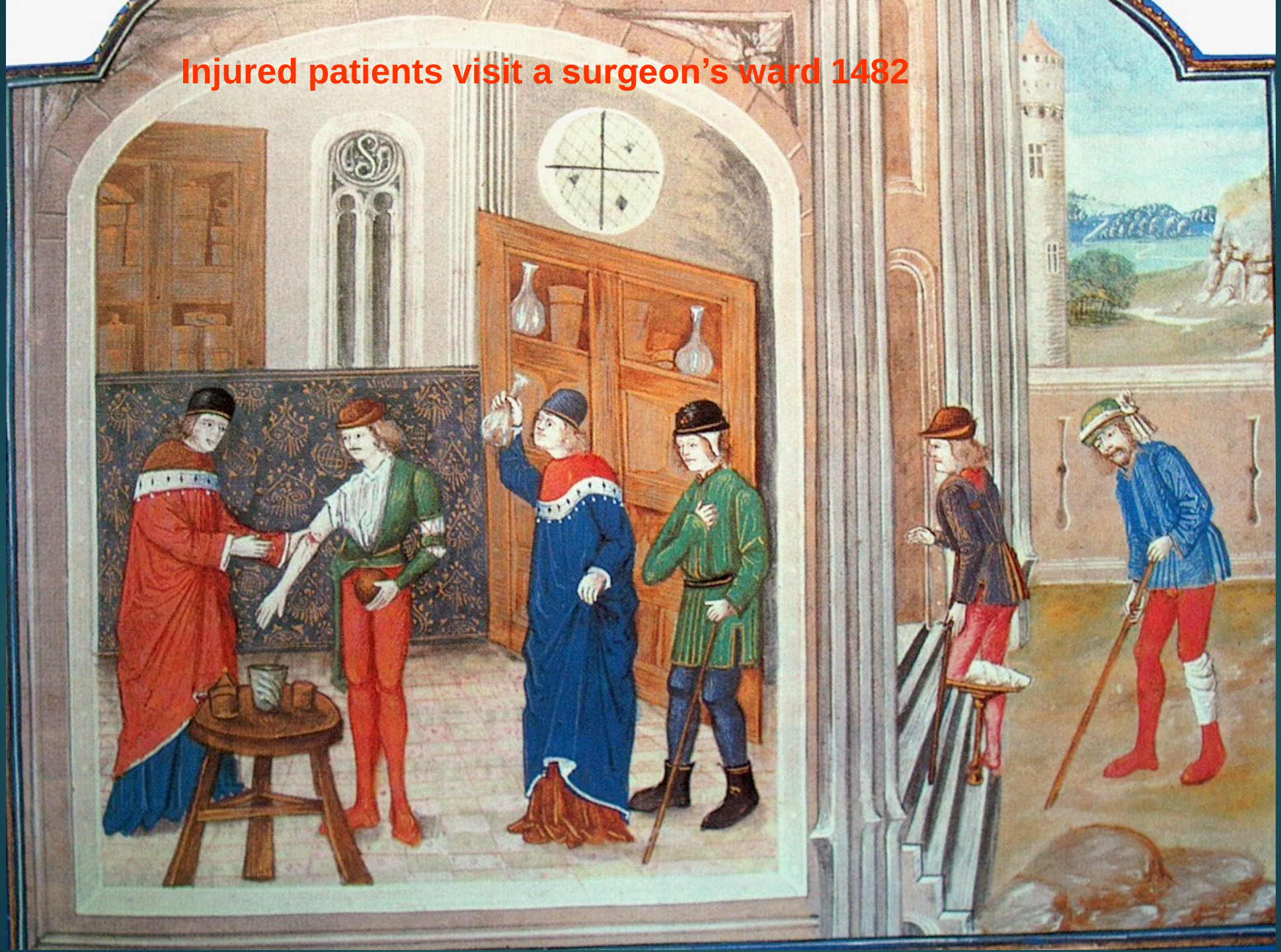
A. VESALIUS *1514 - 1564*

W. HARVEY *1578 - 1657*

Hystory of medicine

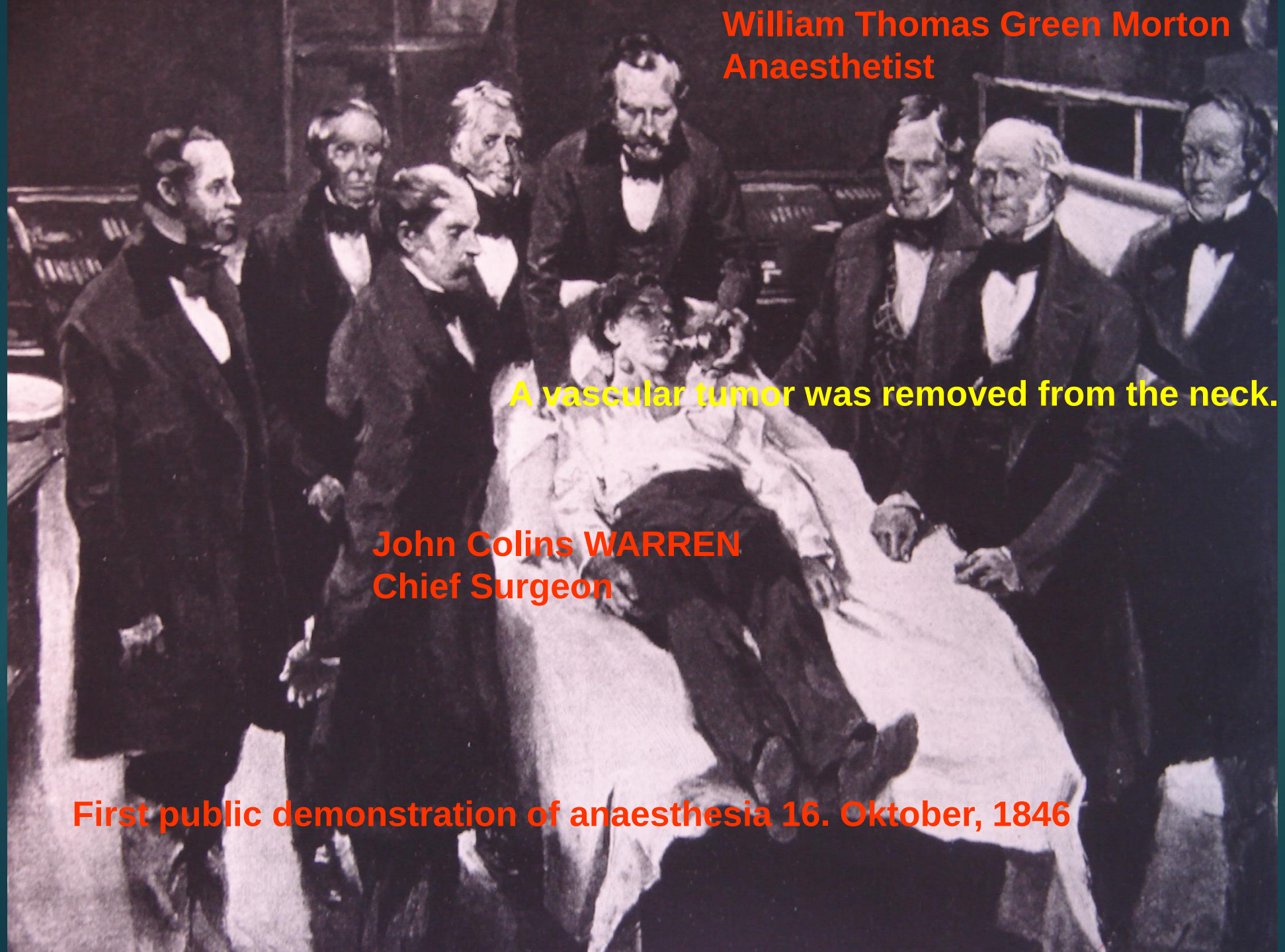
- XVIII. Century: Morgagni: Knowledge in pathology
  - John Hunter: Collateral circulation, inflammation, regeneration
  - Lorenz Heister: surgical textbook
  - Academie Royale de Chirurgie 1843
  - Royal College of Surgeons 1843
- Difficulty in development: lack of asepsis, antisepsis, lack of anaesthesia

Injured patients visit a surgeon’s ward 1482



Hystory of medicine

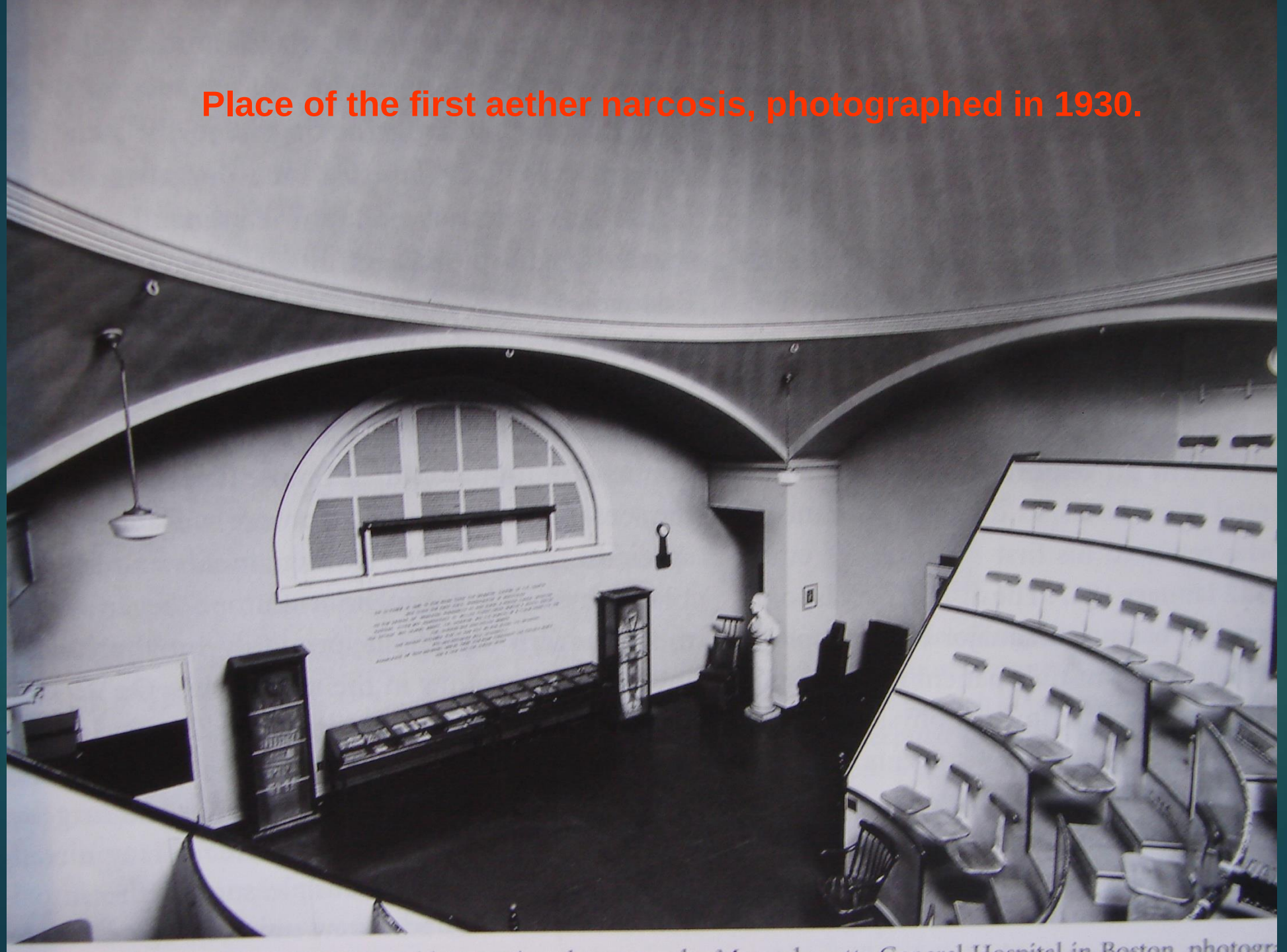
- **First narcosis with ether:** Crawford W. Long 30. March 1842.
- **Narcosis with nitrogen oxidul:** Horace Wells 1844-1846
- **16. 10. 1846.:** John Collins Warren in the Massachussetts General Hospital, Boston removes a tumor from the neck in narcosis with aether (anaesthetist: William T. G. Morton), this is the beginning of the modern surgery


William Thomas Green Morton
Anaesthetist
A vascular tumor was removed from the neck.
John Colins WARREN
Chief Surgeon
First public demonstration of anaesthesia 16. Oktober, 1846

that not even the faintest sigh would be heard with his method of extracting teeth. At t

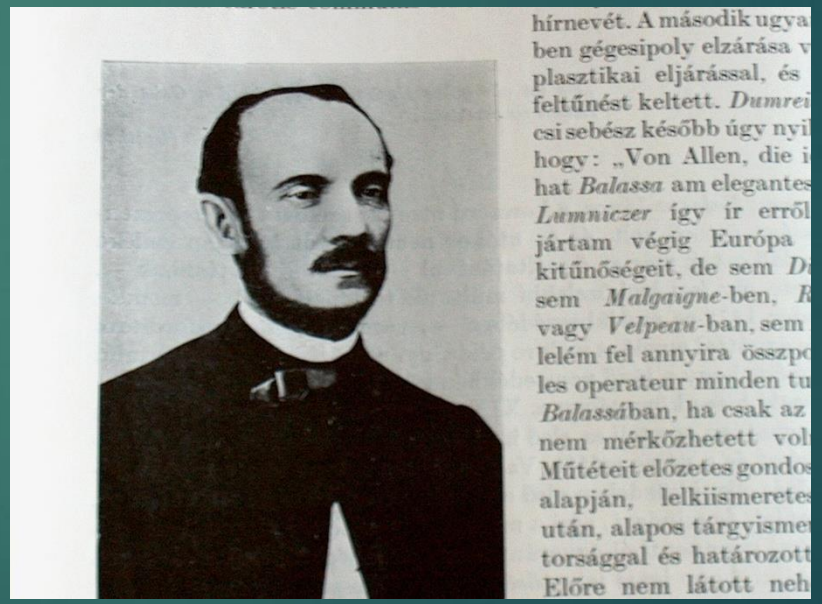
Massachusetts General Hospital in Boston

Place of the first aether narcosis, photographed in 1930.



Hystory of medinine in Hungary

- Janos Balassa 1814-1868.
- Ether narcosis: 1847. január 11.
- died to appendicitis



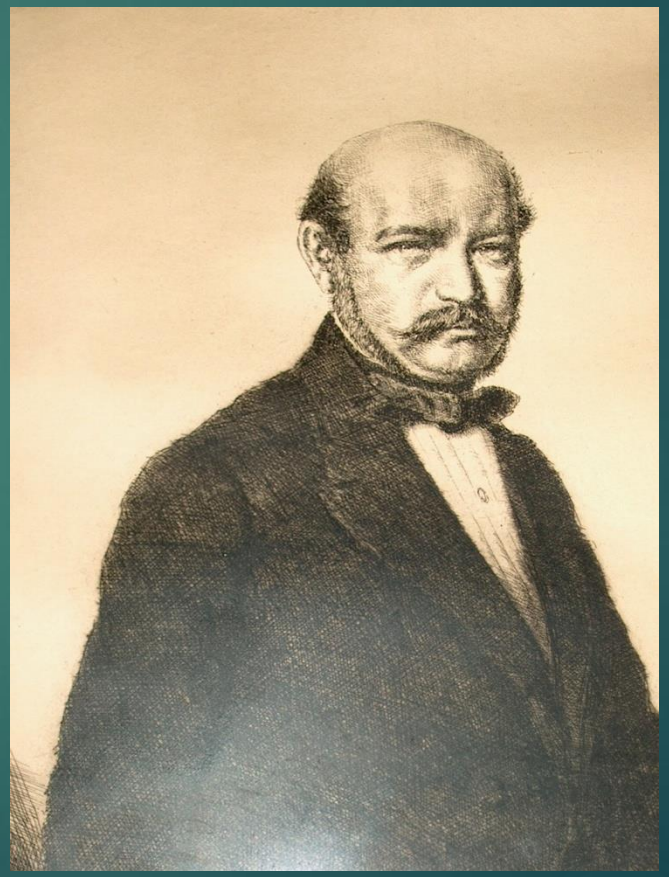
hírnevét. A második ugya
ben gégesipoly elzárása v
plasztikai eljárással, és
feltűnést keltett. *Dumrei*
csi sebész később úgy nyil
hogy: „Von Allen, die i
hat *Balassa* am elegantes
Lumniczer így ír erről
jártam végig Európa
kitűnőségeit, de sem *D*
sem *Malgaigne*-ben, *B*
vagy *Velpeau*-ban, sem
lelém fel annyira összpo
les operateur minden tu
*Balassá*ban, ha csak az
nem mérkőzhetett vol
Műtéteit előzetes gondos
alapján, lelkiismeretes
után, alapos tárgyisme
torsággal és határozott
Előre nem látott neh

Hystory of medinine

- **The most serious complication in surgery was the infection**
  - **Ignac Semmelweis (1818-1865) He realised the importance of disinfection**
  - **Joseph Lister (1827-1912): Asepsis – antisepsis**
  - **Louis Pasteur 1863: Realised the microorganisms behind infections**
  - **Robert Koch 1878: he strengthens the previous observation**

Hystory of surgery

- Ignác Semmelweis (1818-1865)



L. PASTEUR *1822 - 1895*

Celebration of Pasteur's 70th birthday in the University of Sorbonne, Paris

Hystory of surgery

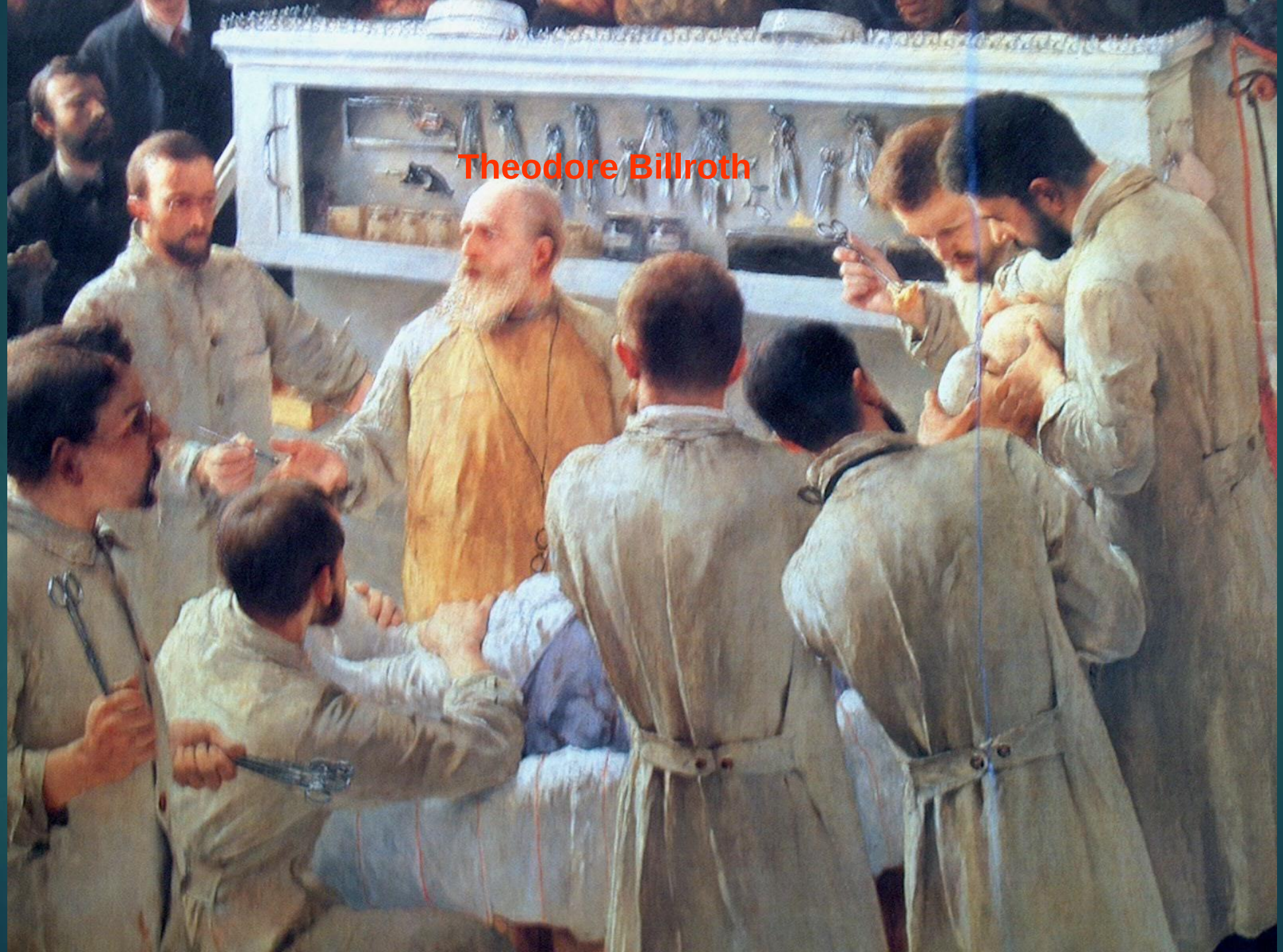
- **Sterilisation:**
  - Trendelenburg: 1882: sterilisation with steam
  - Braun, Neuber, Schimmelbusch: autoclave (heat and pressure)
  - Halstedt 1891: sterile rubber gloves

Hystory of medicine

- **Wilhelm Konrad Roentgen 1895:** invented the X-ray
- **Landsteiner 1900:** blood groups
- **Koller 1884:** local anaesthesia with cocaine
- **Einhorn 1905:** Novocain
- **Magill and Rowbothan:** anaesthesiology, foundations
- **Alexander Fleming 1929:** Penicillin

Hystory of medicine

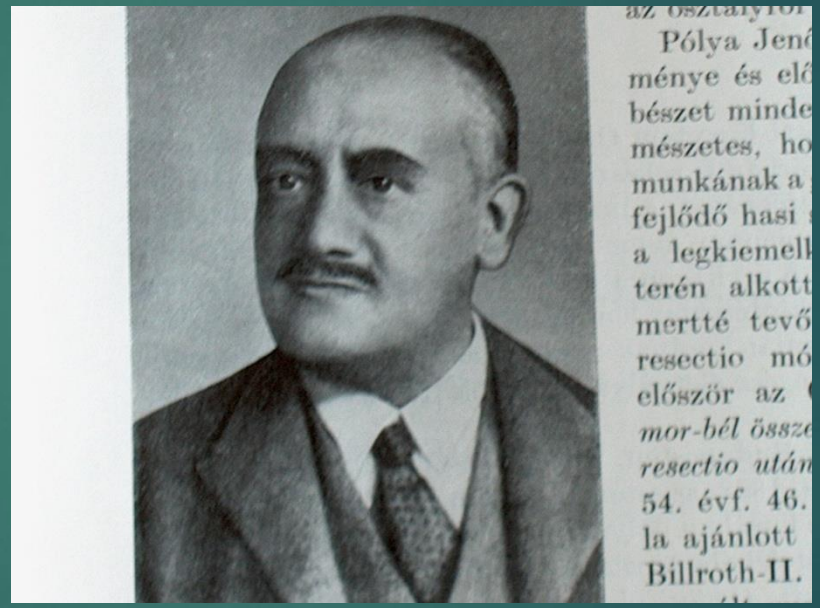
- **Theodor Billroth (1829-1894):** 1881: first partial gastrectomy
- **Morton és McBurney 1886:** appendectomy
- **Carl Langenbech 1882:** cholecystectomy
- **Ernest Miles 1908:** abdominoperineal rectum resection
- **Teodor Kocher:** surgery of thyroid gland
- **W. St. Halsted 1890:** mastectomy


Theodore Billroth

Surgical removal of an ovarian tumor

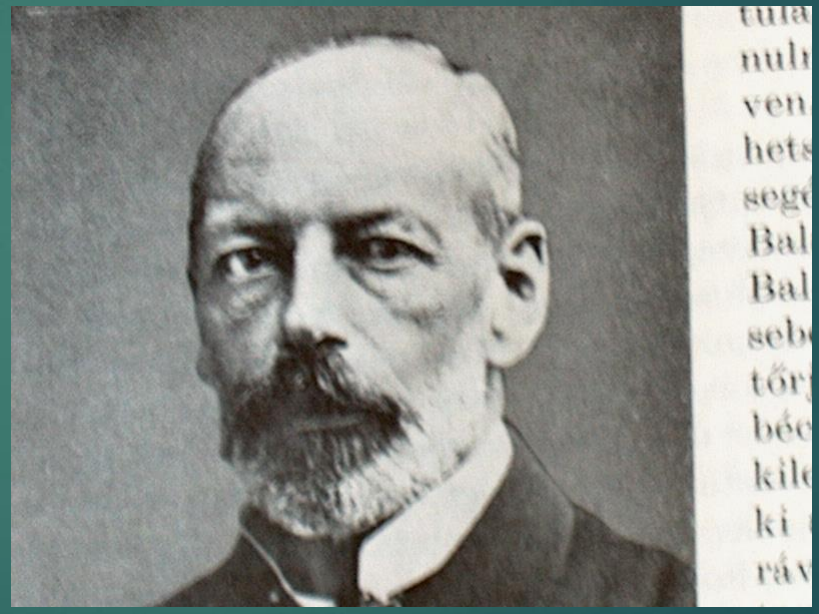
Hystory of medicine in Hungary

- Jenő Pólya 1876-1944
- His name is well known in the field of gastric surgery
- He became a victim of holocaust



Hystory of surgery

- Sándor Lumniczer



Hystory of surgery Subspecialisations

- Operative ophtalmology
- Operative gynaecology
- Orthopedics
- Urology
- Neurosurgery
- Chest surgery
- Traumatology
- Angiosurgery
- Heart surgery
- Plastic surgery
- Emergency surgery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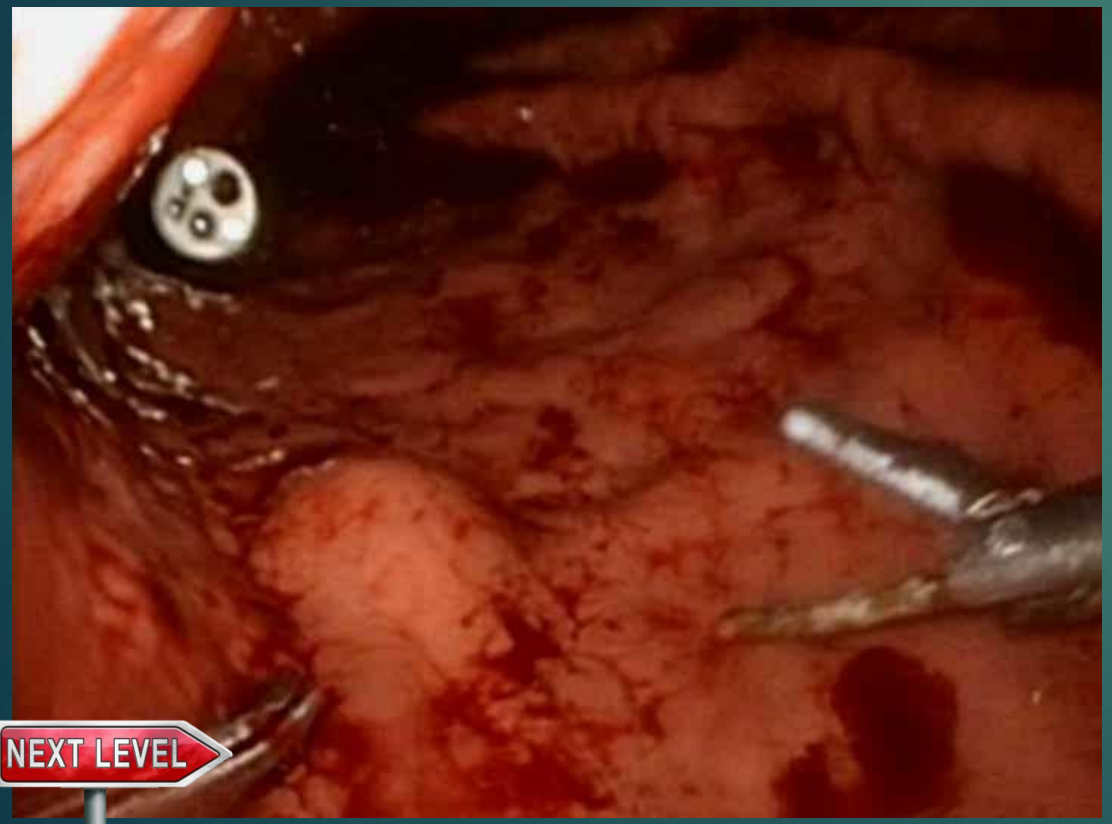
Method 3 – intragastral gastric wall resection „endo-organ-surgery“

intragastrial resection and suture closure



curative procedures

Robotic surgery

Perspectives in surgery

- Minimal invasive surgery
- Laparoscopic surgery
  - Cholecystectomy
  - Appendectomy
  - Adrenalectomy
  - GERD
  - Colon surgery
  - Pancreas, spleen, gastric, oesophageal surgery
- Natural Orifice Trans Endoscopic Surgery (NOTES)

PRINCIPLES OF SURGERY
and the
PERIOPERATIVE PERIOD

The CONCEPT OF SURGERY

- Every intervention in which the patient's tissues, organs, and/or cavities are:
  - Opened (e.g.: exploration, oncotomy)
  - Removed (e.g.: cholecystectomy, gastrectomy)
  - Merged (e.g.: hernia reconstruction, suture of stomach perforation)
  - Reconstructed (e.g.: tendon suture, fracture treatment)
  - Replaced (e.g.: organ transplantation)
  - Or foreign body is inserted into them (e.g.: drainage)
  - Or are replaced with foreign body (e.g.: vascular prothesis, hip prothesis, mesh)

- Percutaneous interventions involving invasive radiological and other imaging techniques (e.g.: percutaneous angioplasty, US-guided drainage) and endoscopic interventions (e.g.: polypectomy, sclerotizing) are also considered surgery as they entail intervening in the natural structure of the organism.

SURGICAL INDICATION

- Indication means the NECESSITY of surgery:
  - **ABSOLUTE**: surgery is an indispensable part or way of treating the disease
    - **VITAL (IMMEDIATE)**: there is no time to be wasted, because without surgery, the patient will be lost, he/she is in a life-threatening condition (e.g.: aortic aneurysm rupture, tense pneumothorax, rupture of parenchymal organ, haemopericardium, arterial bleeding, etc.), or he/she is not in a life-threatening condition yet, but delay might cause a lasting health damage (e.g.: acute vascular occlusion, acute discus hernia with nerve compression, etc.)
    - **URGENT**: the patient requires surgery within a few hours, but we have some time to arrange the most important parameters (e.g.: acute appendicitis, ileus, fractures, abscesses, etc.)
    - (SEMIURGENT)
    - **ELECTIVE (PLANNED)**: the surgery can be postponed, there is plenty of time to prepare for arranging optimal circumstances (e.g.: hernia surgery, organ transplantation, bariatric surgery)
  - **RELATIVE**: there are other alternative therapeutic options, other than surgery; therefore, it should be considered what kind of treatment to choose (e.g.: medical treatment for ulcer patients, invasive endoscopic intervention in case of bile duct stones)
    - Special relative indication: mental reason, cosmetological reason (e.g.: breast augmentation, burn plasticsurgery)
    - Prophylactic surgery: the goal is to prevent probable complications (pl.: silent cholelithiasis, carotid art. stenosis without symptoms, „eliminating infection sources" before heart surgery)

SURGICAL CONTRAINDICATION

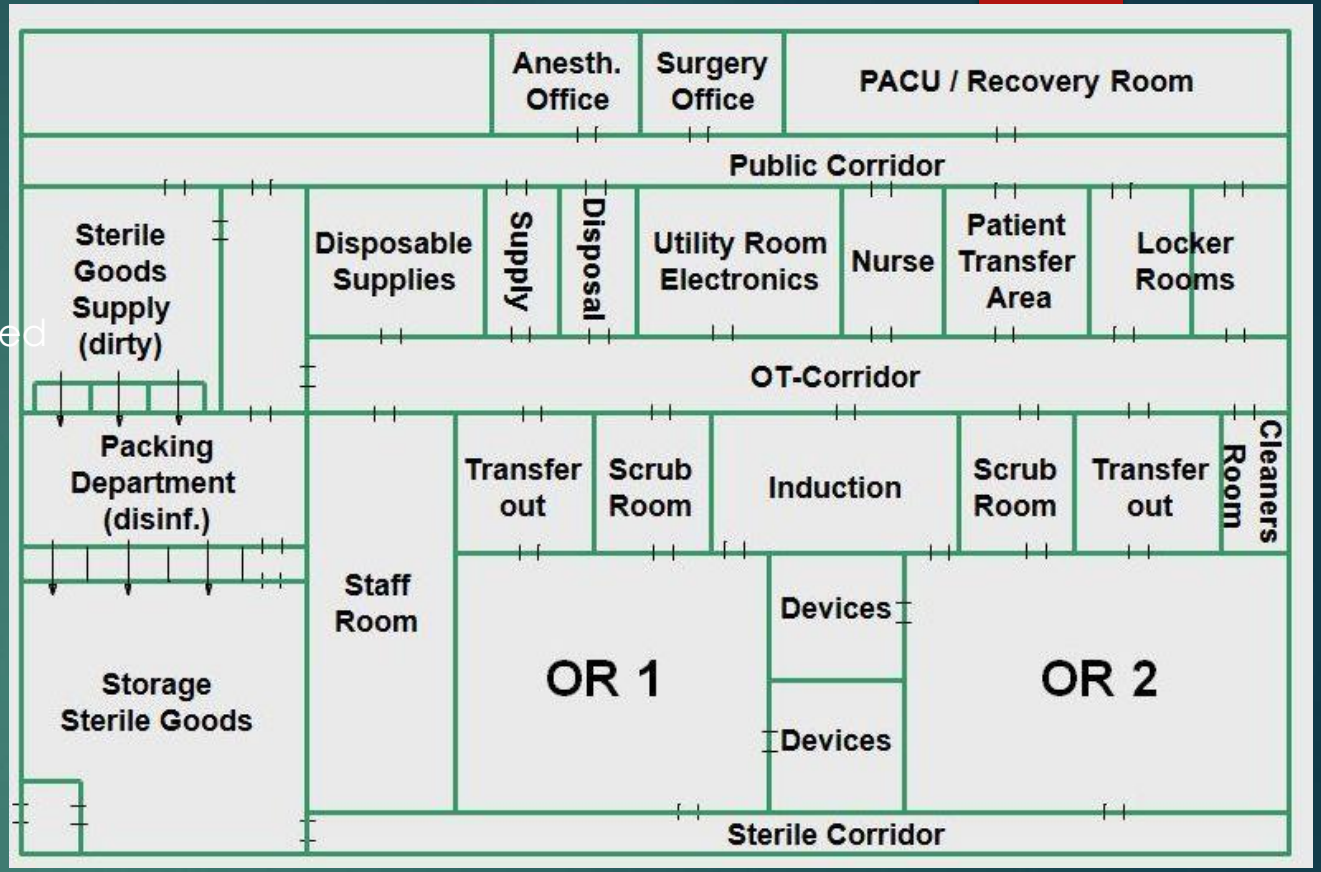
- SURGICAL CONTRAINDICATIONS mean those circumstances that are against performing the surgery.
  - **ABSOLUTE**: e.g.: recent ACS / AMI
  - **RELATIVE**: a COST-BENEFIT analysis has to be carried out before the surgery to weigh up the possible benefits and negative side effects of delaying or not performing the surgery
- ***Vital surgery has no contraindication!***

- **Operability?**
  - **INOPERABLE:** The intervention is technically impossible, as it would require removing a vital organ, or it would result in such serious health damage which is incompatibel with life (e.g.: removing the whole small intestine tract.)
    - The conditions of the surgery are not given (e.g.: incureable shock except bleeding, end stage cancer)
  - **IRRESECABLE**: the tumour can not be removed, as the intervention would include removing vital organs
  - **INCURABLE:** there is none effective treatment available

THE LAYOUT OF THE OPERATING ROOM

- Isolating the operating room, operating block (upstairs)
- DISINFECTED and DIRTY sections need to be isolated
- Washable surfaces, antistatic floor, round corners, unfixed furniture
- Separating sterile and septic operating rooms
- Air-conditioning: 18-22 C, humidity 50-65%
- Central aspiration, central oxygen, (condensed air, anesthetic gas)
- Only one operating table is allowed in one room.

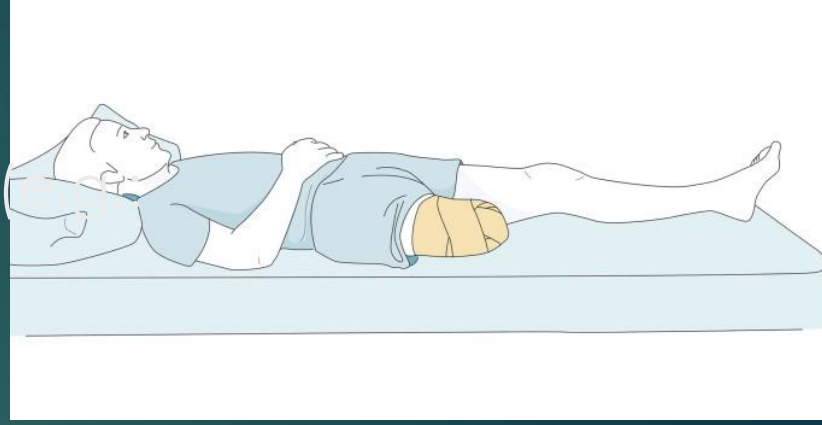
- Room adjacent to the operating room:
  - Sluice (one for staff, one for patient)
  - Lead-in and lead-out corridors
  - Scrub room
  - Preparatory room
  - Postoperative recovery room
  - Clean storage rooms
  - Disposal
  - Utility room
  - Dispatcher in case of a central operating room

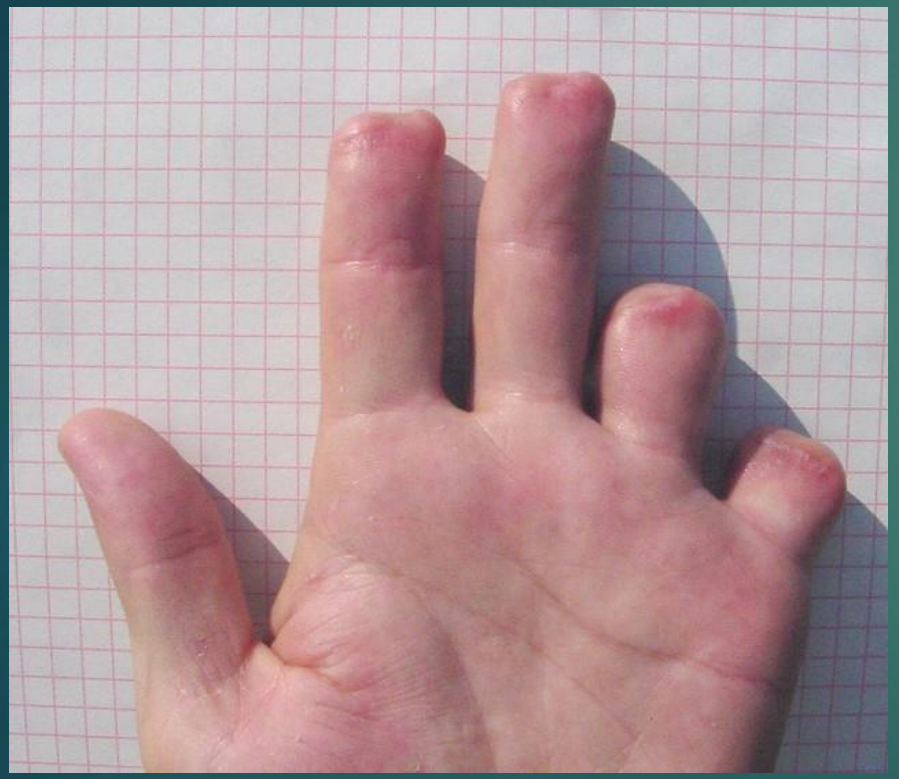


THE MOST FEQUENT TYPES OF SURGICAL INTERVENTIONS

1. AMPUTATION
2. ANATOMOSIS
3. BYPASS
4. DESOBLITERATION
5. ENTERO-ENTEROSTOMY
6. ENTEROSTOMY
7. ENUCLEATION
8. EXCOCHLEATION
9. EXCISION
10. EXSTIRPATION
11. INCISION
12. RECONSTRUCTION
13. RESECTION
14. REPLANTATION
15. SCLEROTISATION
16. TRANSPLANTATION

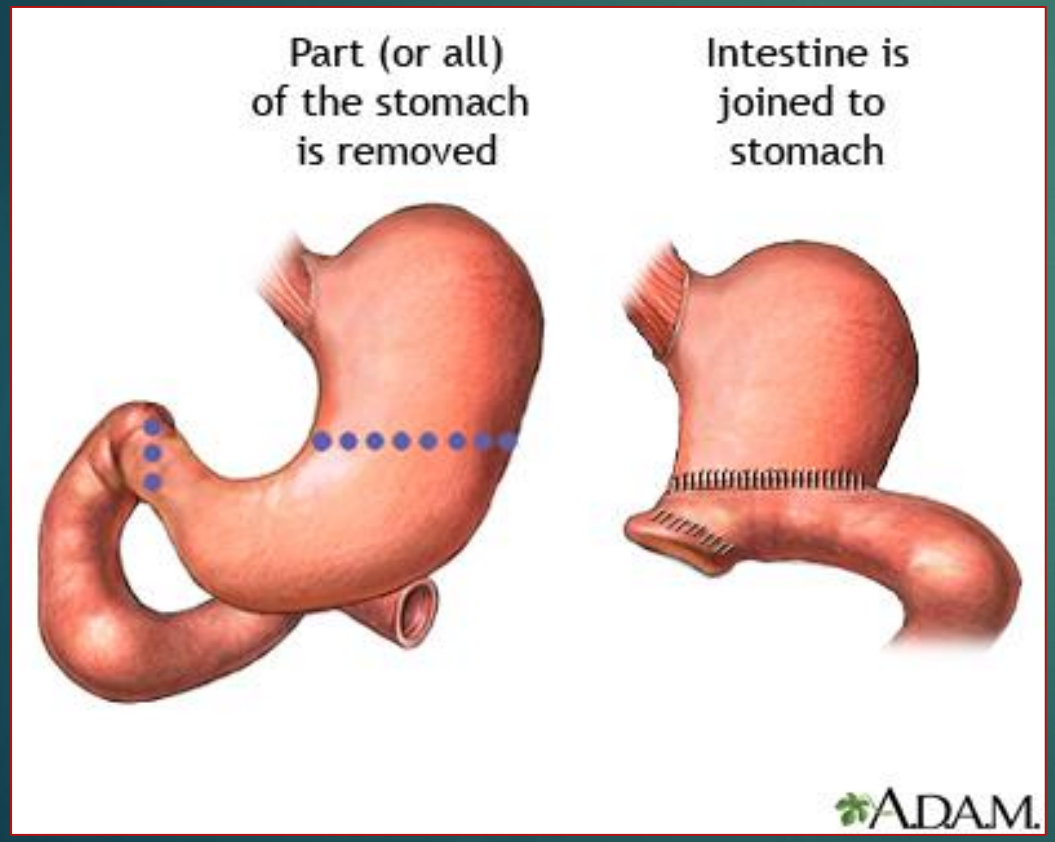
1. **AMPUTATION**: acral organ or extremity total removing (
finger, tigh, breast)

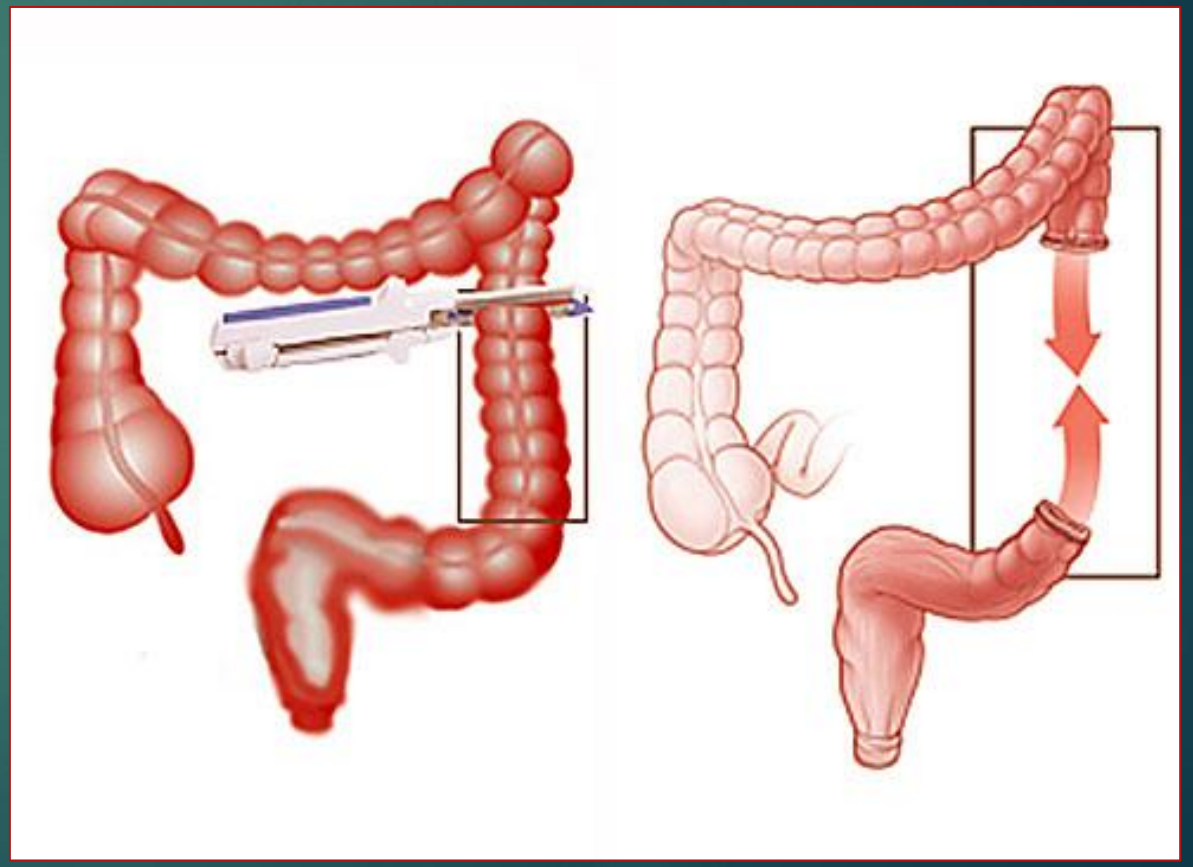




Appearance following mastectomy without reconstruction

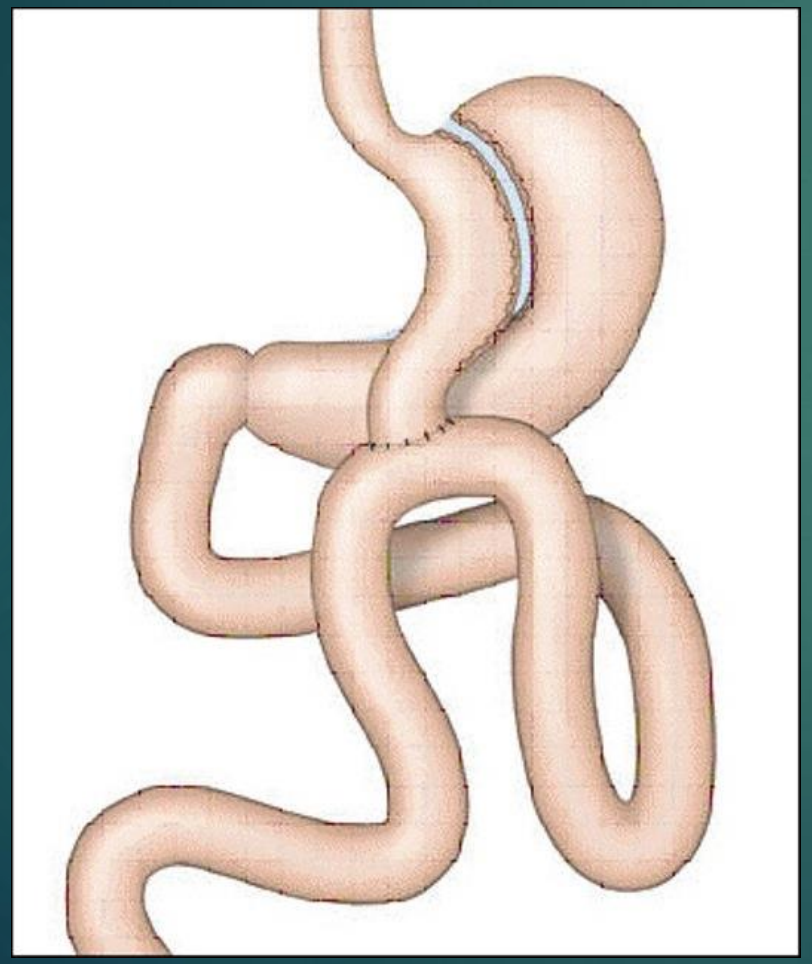
2. **ANASTOMOSIS**: merging luminar organs (e.g.: GEA, colo-colostomy)



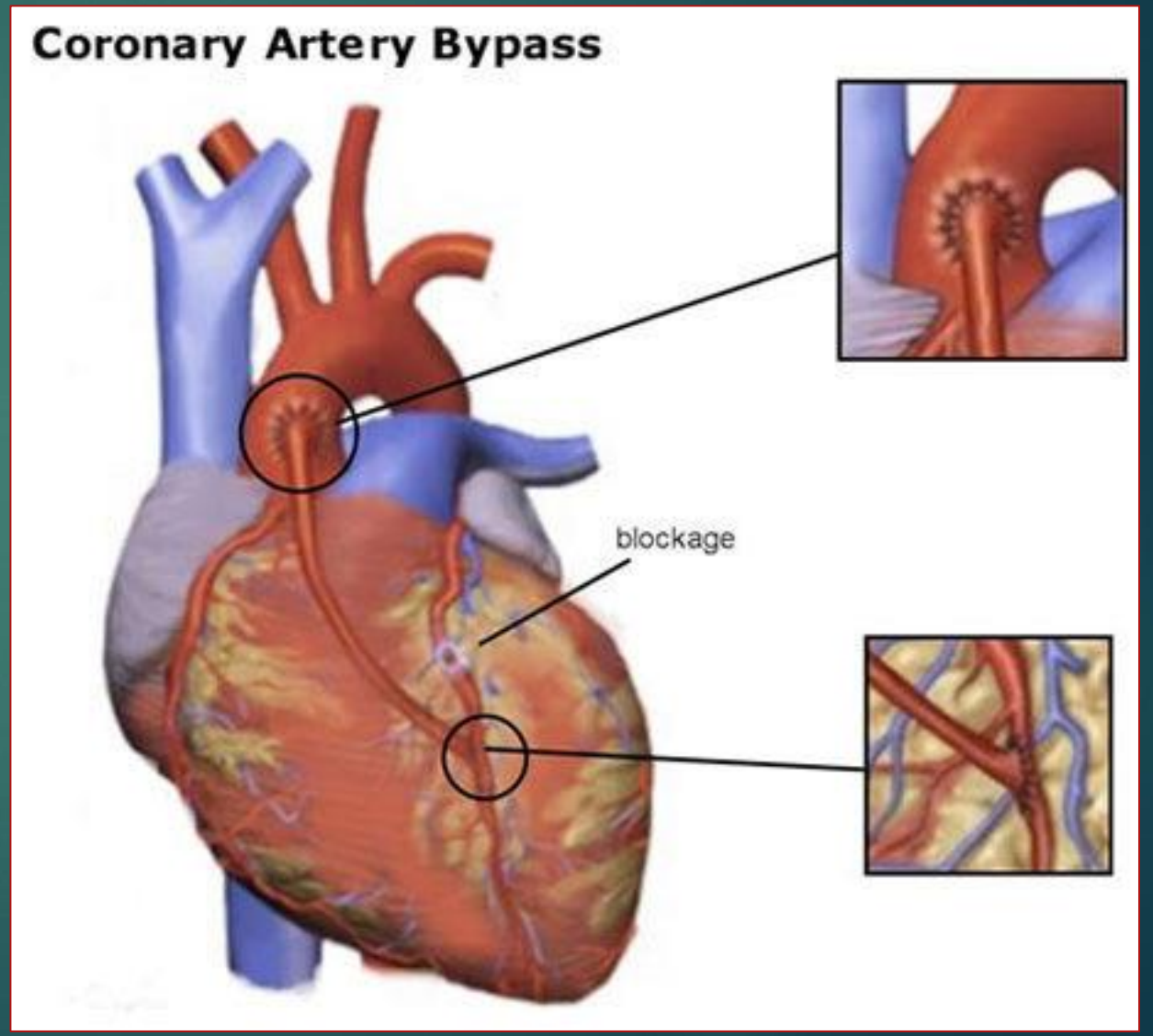


3. **BYPASS:**

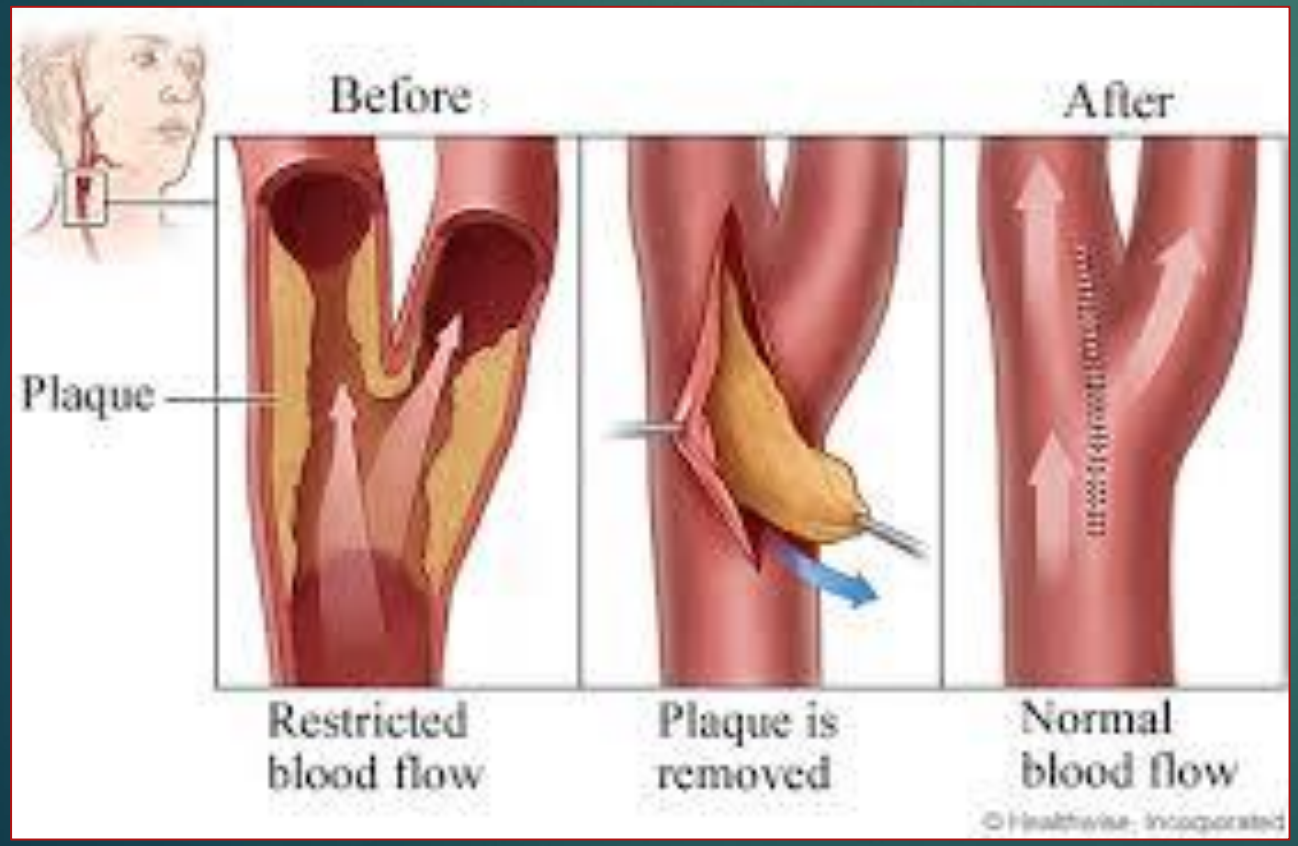
- „Get around something” (e.g.: barriatric op.)

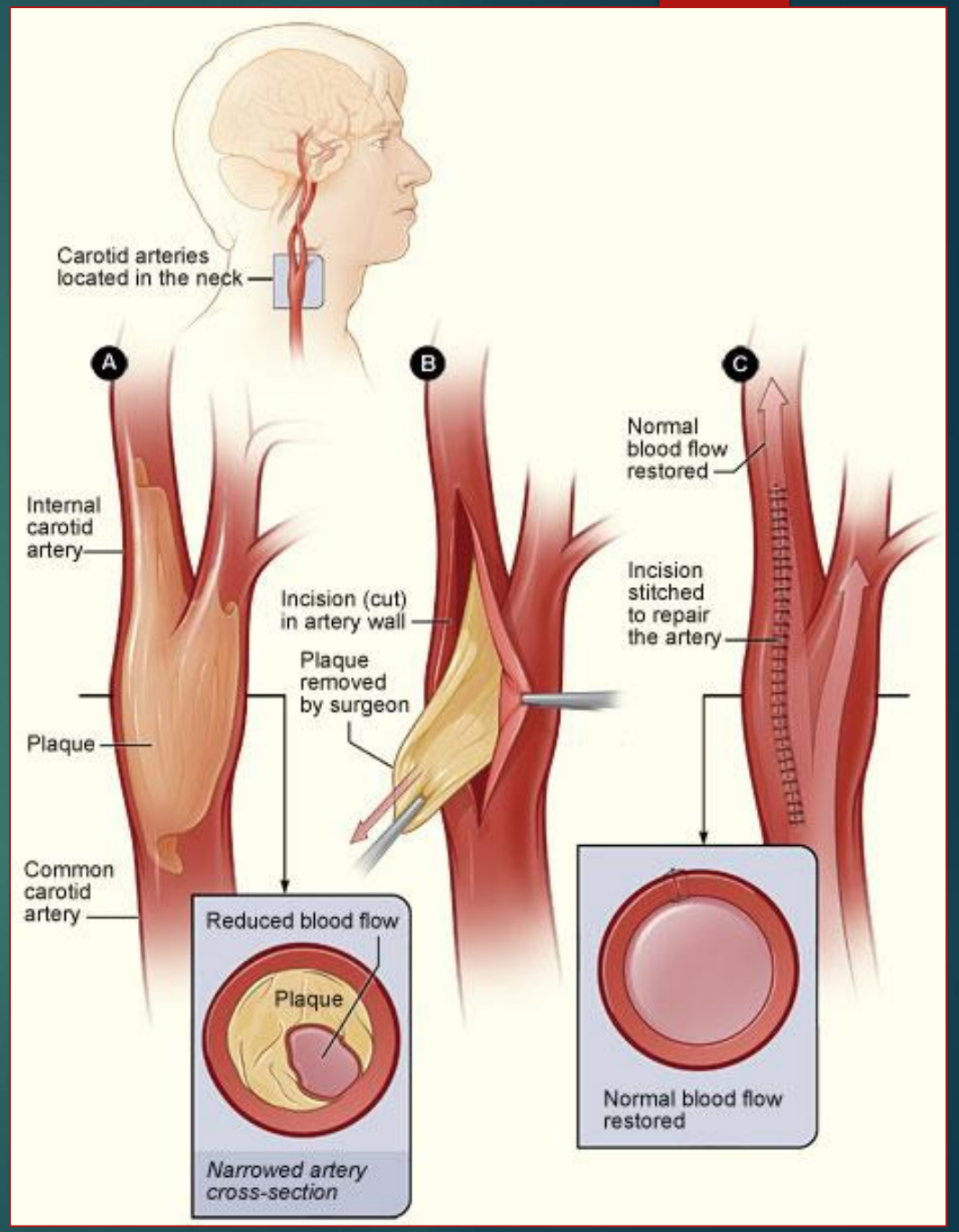


- Vascular bypass (e.g.: CABG, ileofemoral bypass)

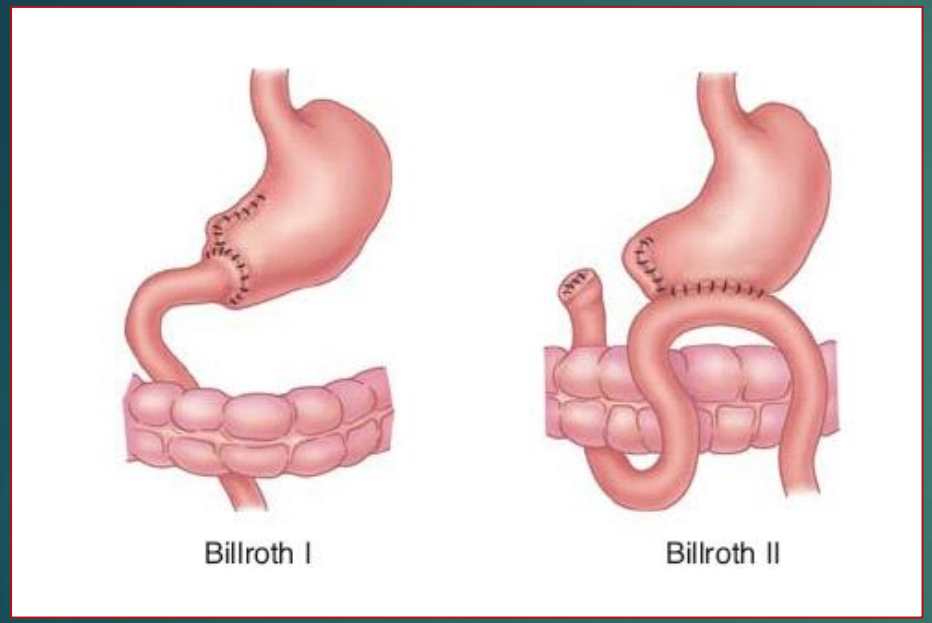


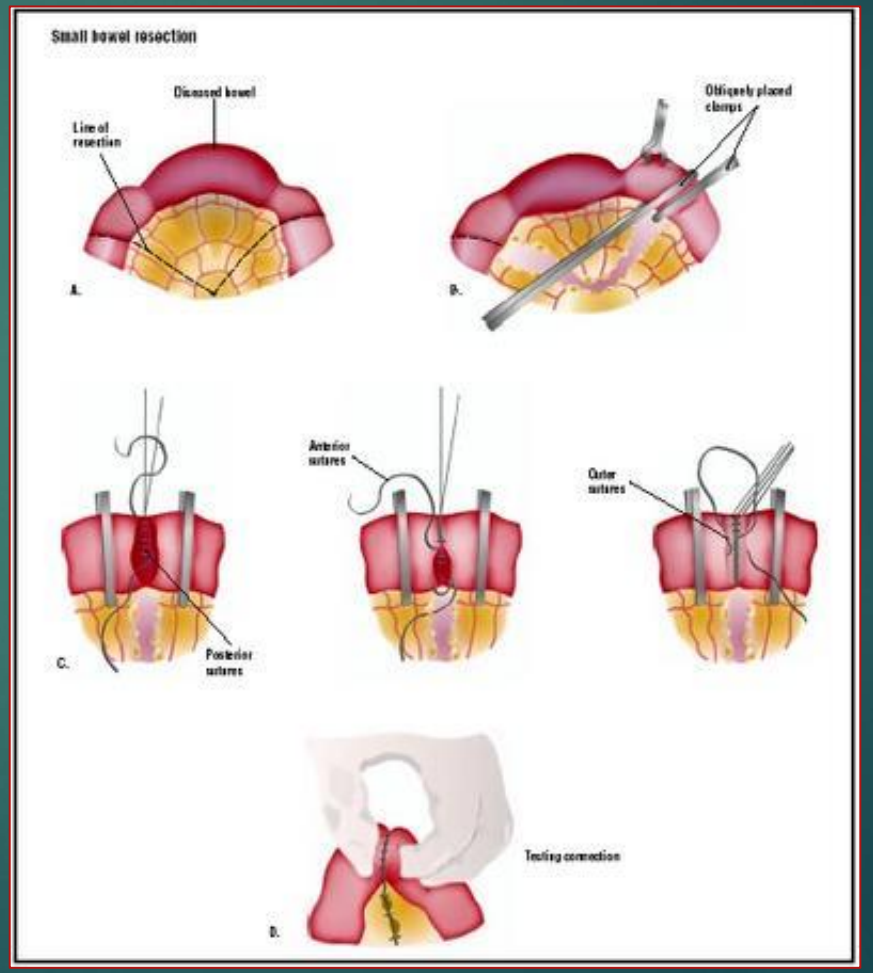
4. **DESOBLITERATION:** opening an obstructed vessel



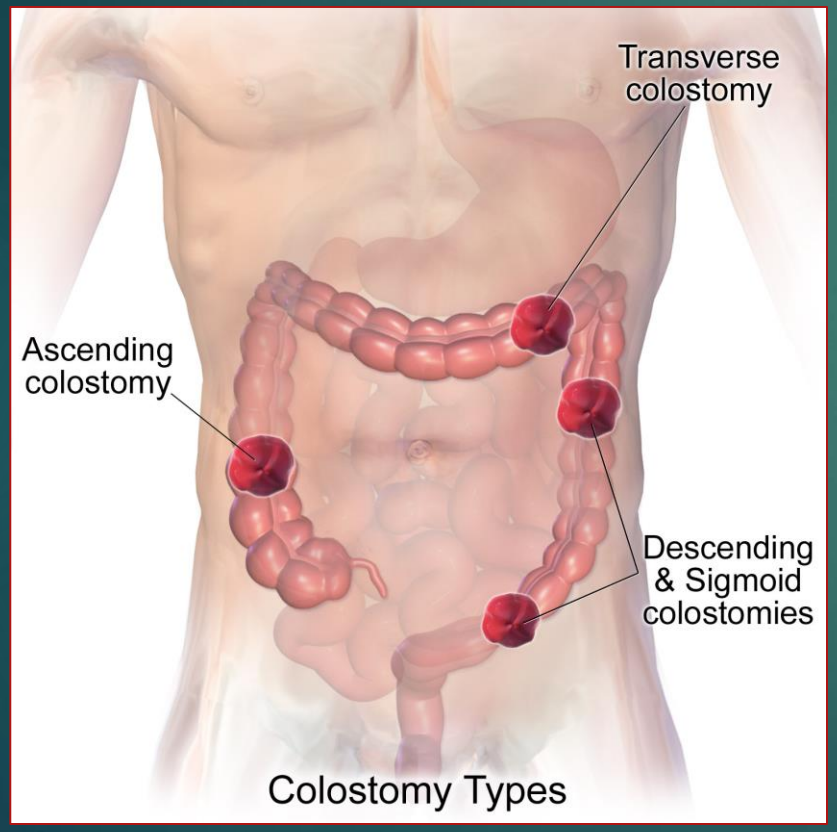


5. **ENTERO-ENTEROSTOMY:** suturing anastomosis between luminar organs

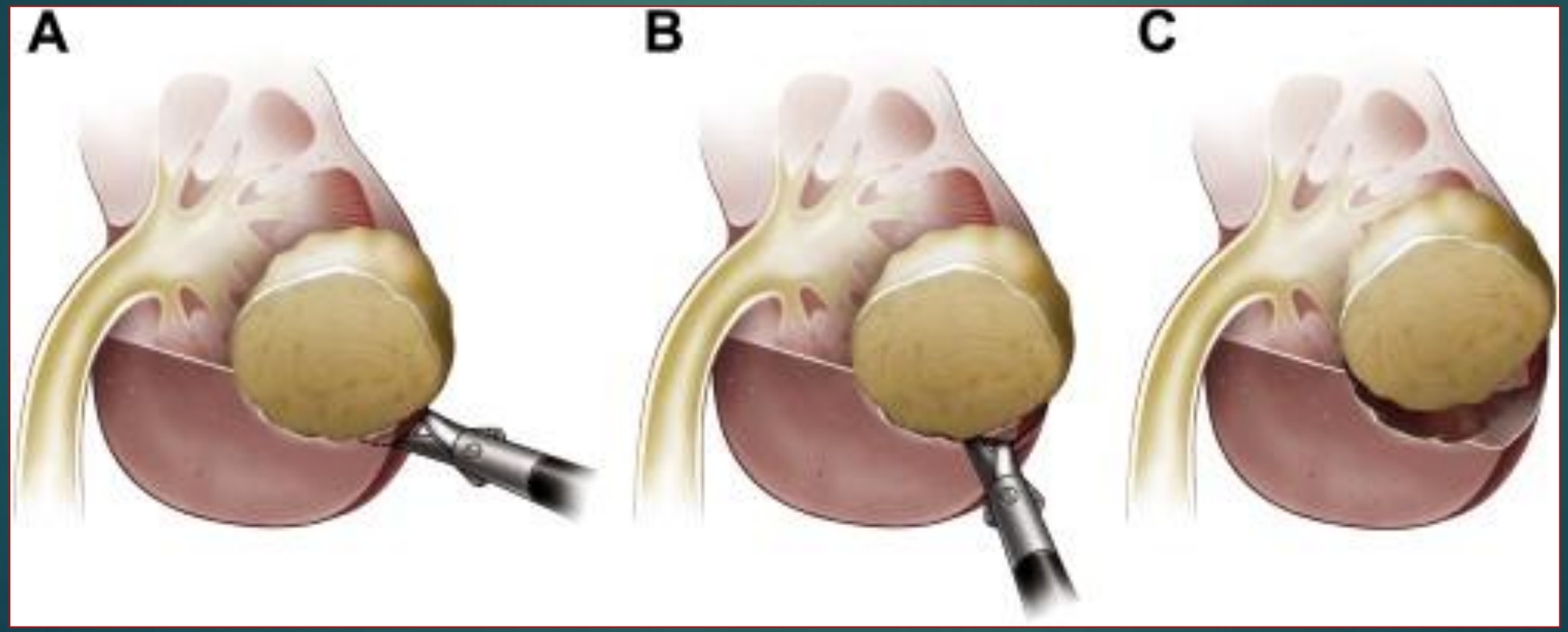




6. **ENTEROSTOMY**: „lead out" a bowel to the skin (spontaneous, arteficial)
e.g.: ileostomy, colostomy, anus praeternaturalis)



7. **ENUCLEATION:** removing something, which has capsule or pseudocapsule (e.g.: benign tissues, cyst)

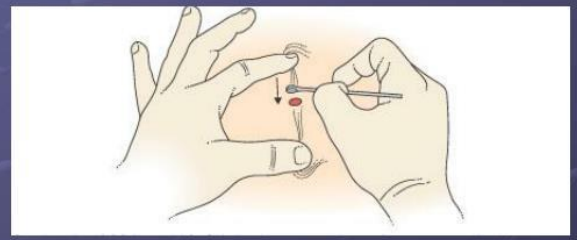


8. **EXCOCHLEATION**: removing something with sharp devices (Volkmann-spoon) (e.g.: fistule, sebaceus skincyst, necrosis)

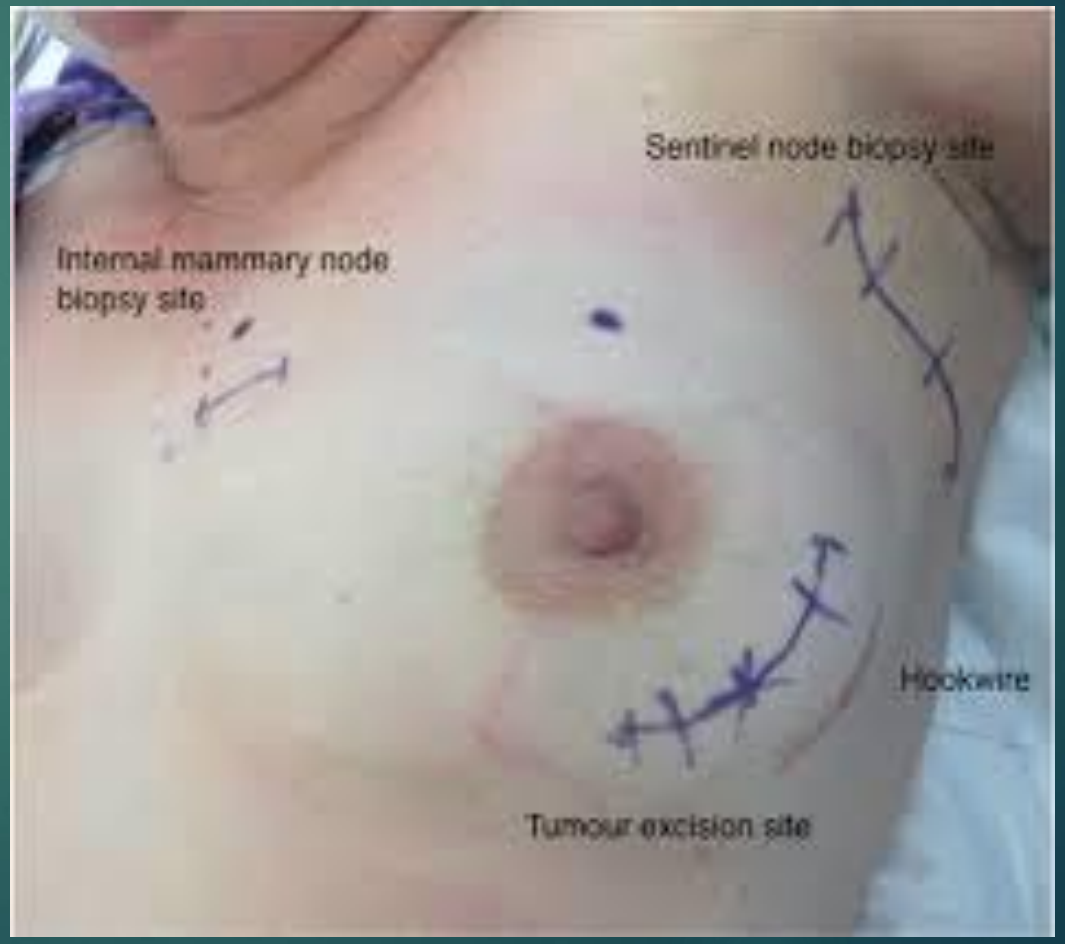
Here one can see excochleation of a wart with a curette. After removing the lesion, one can use a hyfrecator to cauterize the base.

Curettage Technique

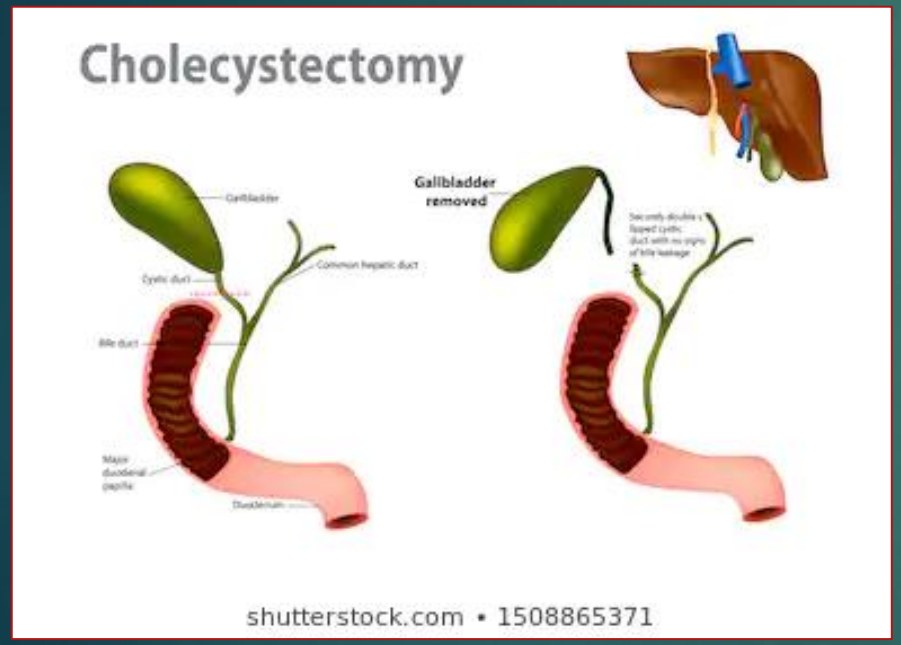
- An excochleation technique
- "Scoops" the lesion intact from the surrounding tissue
- Useful for verrucae and porokeratoses

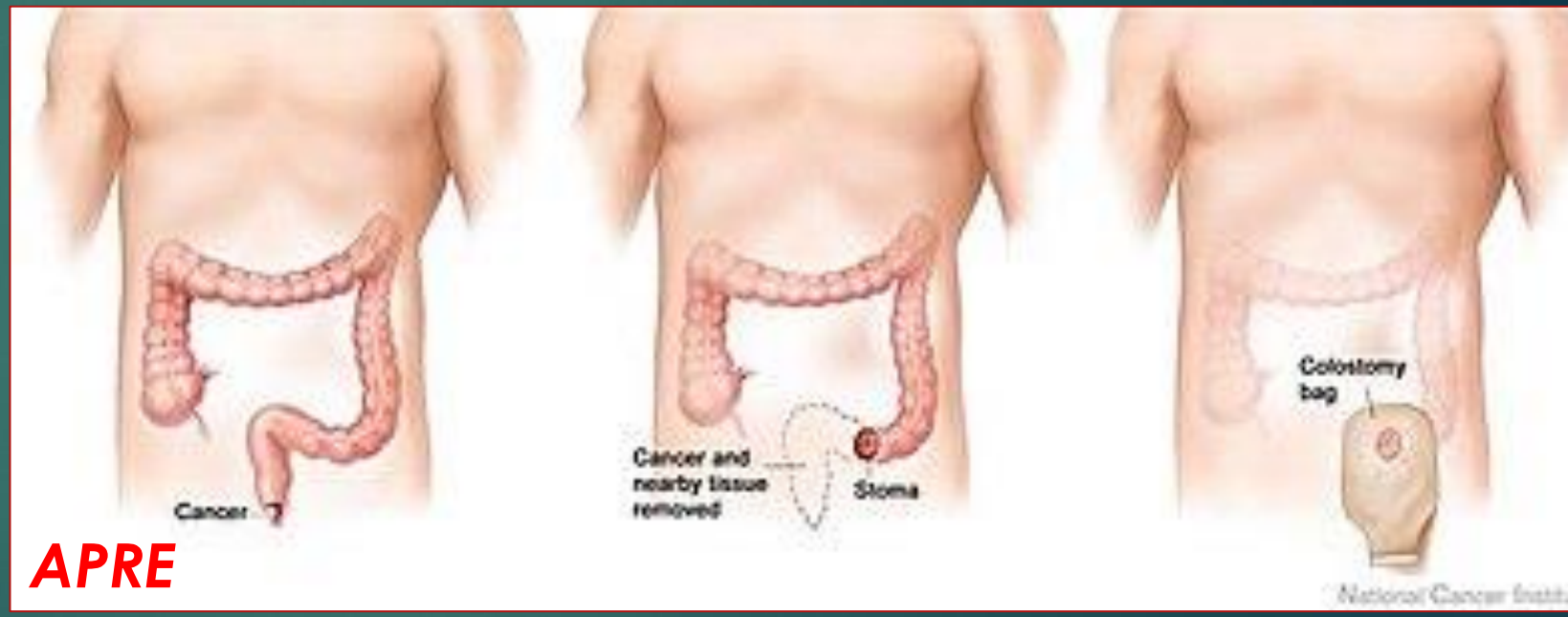


10. **EXCISION**: excision without crossing the border of an organ

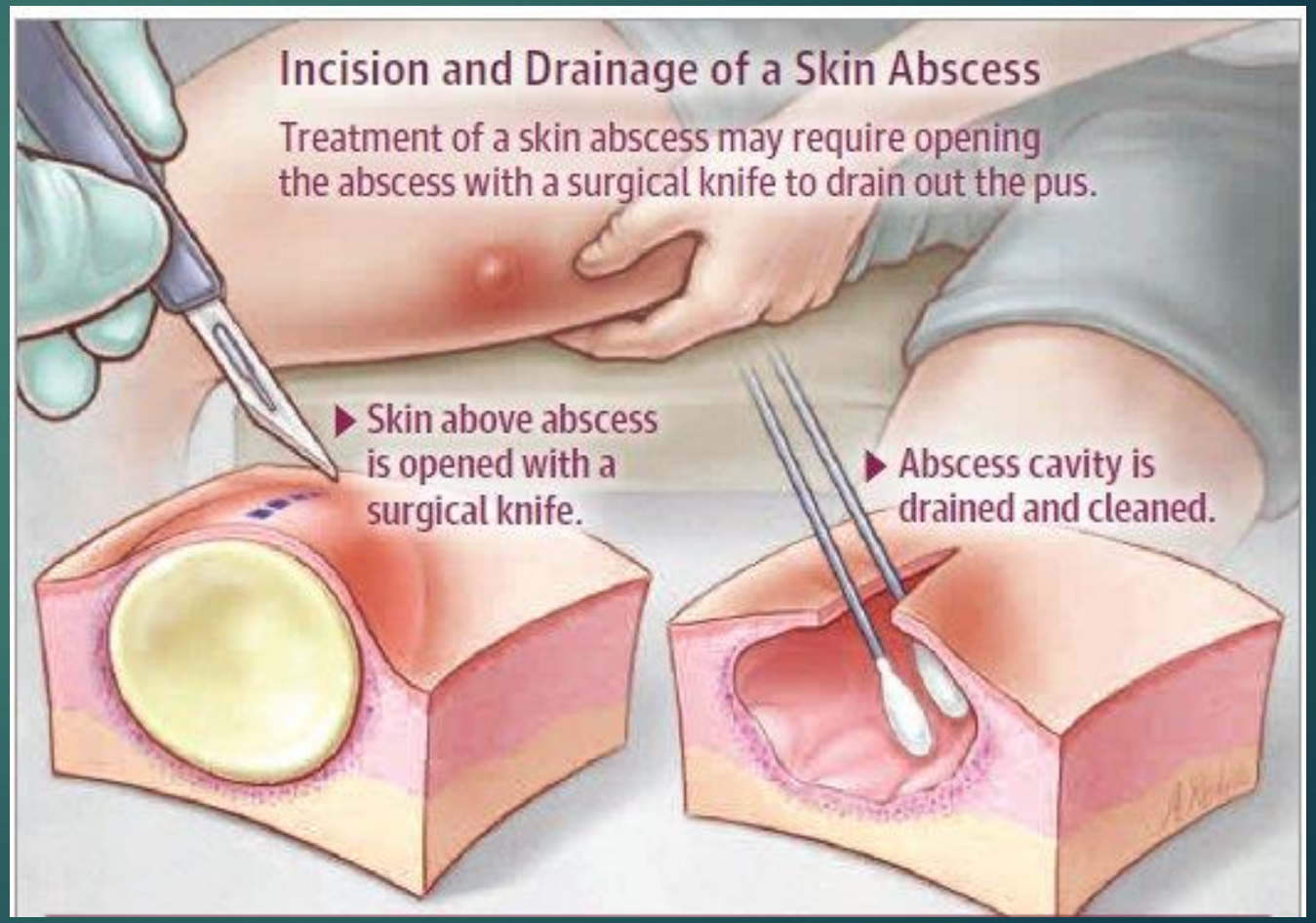


11. **EXSTIRPATION**: complete removal of an organ (e.g.: cholecystectomy, APRE, gastrectomy, pulmonectomy)





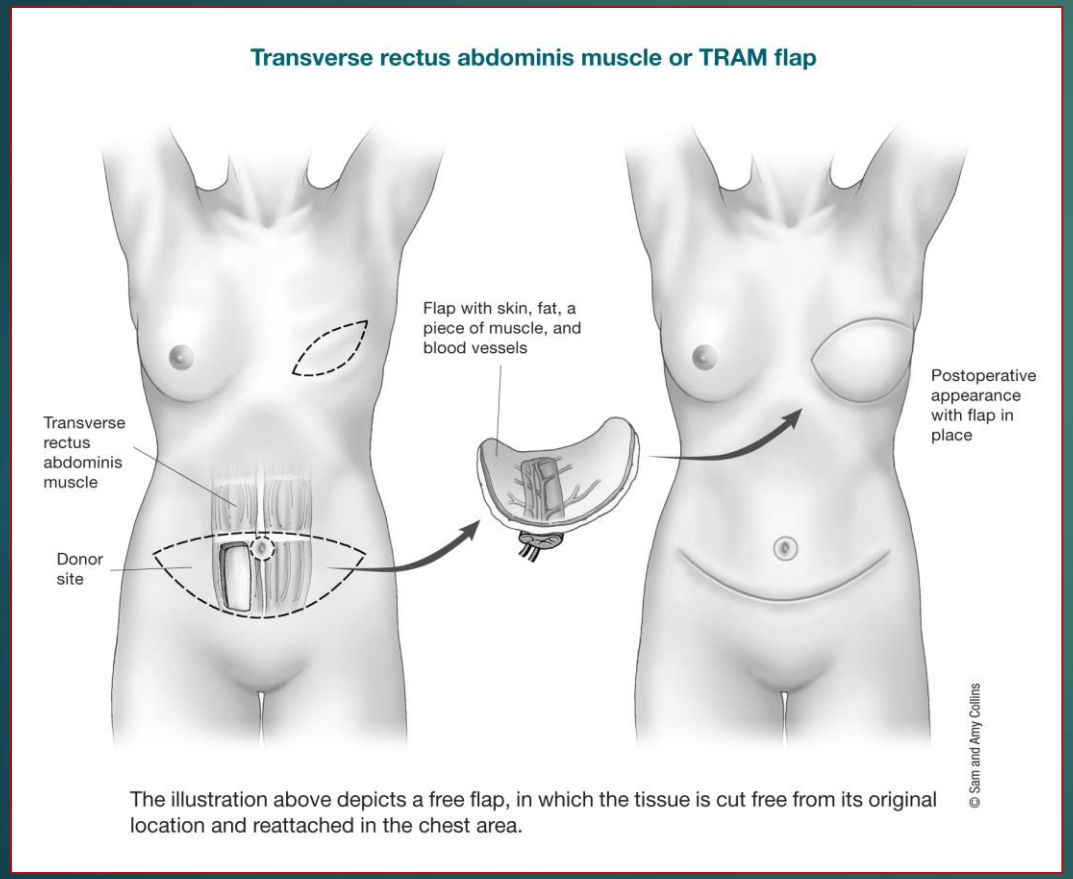
12. **INCISION**: open a natural cavity (abdominal cavity, thorax) or a pathologic cavity (e.g.: abscess)



ONCOTOMY +/- DRAINAGE

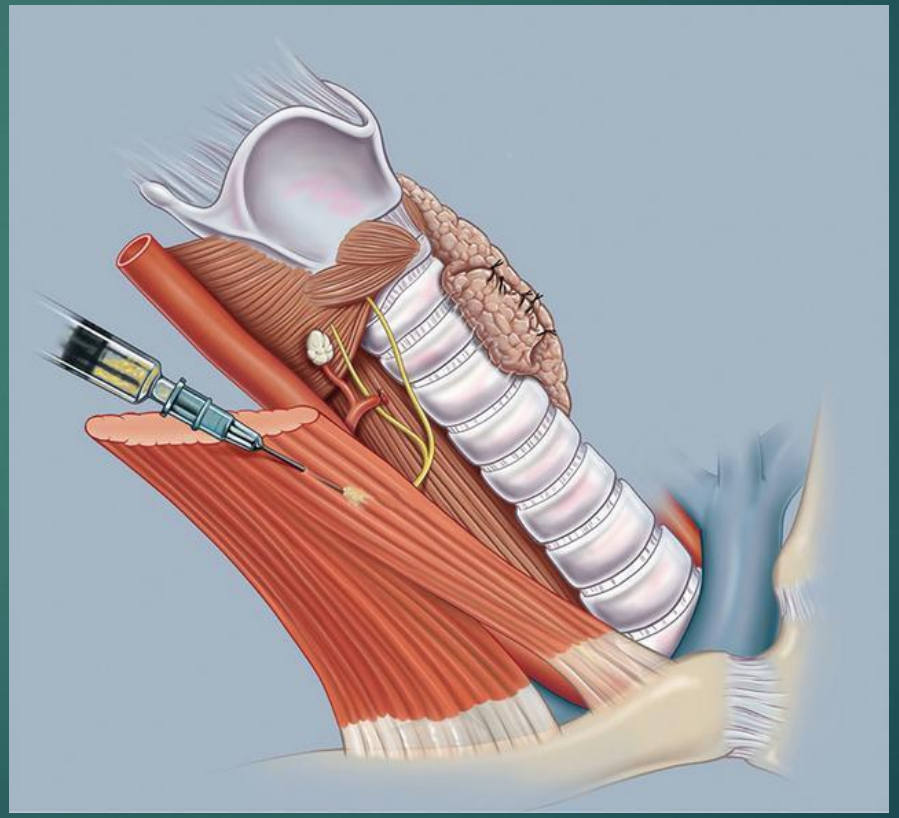
13. **RECONSTRUCTION**: e.g.: breast plastica

Appearance following mastectomy without reconstruction

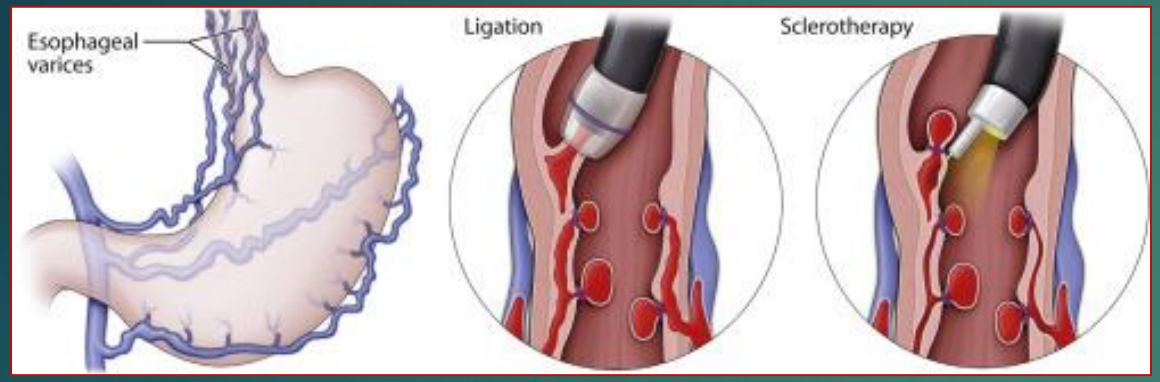


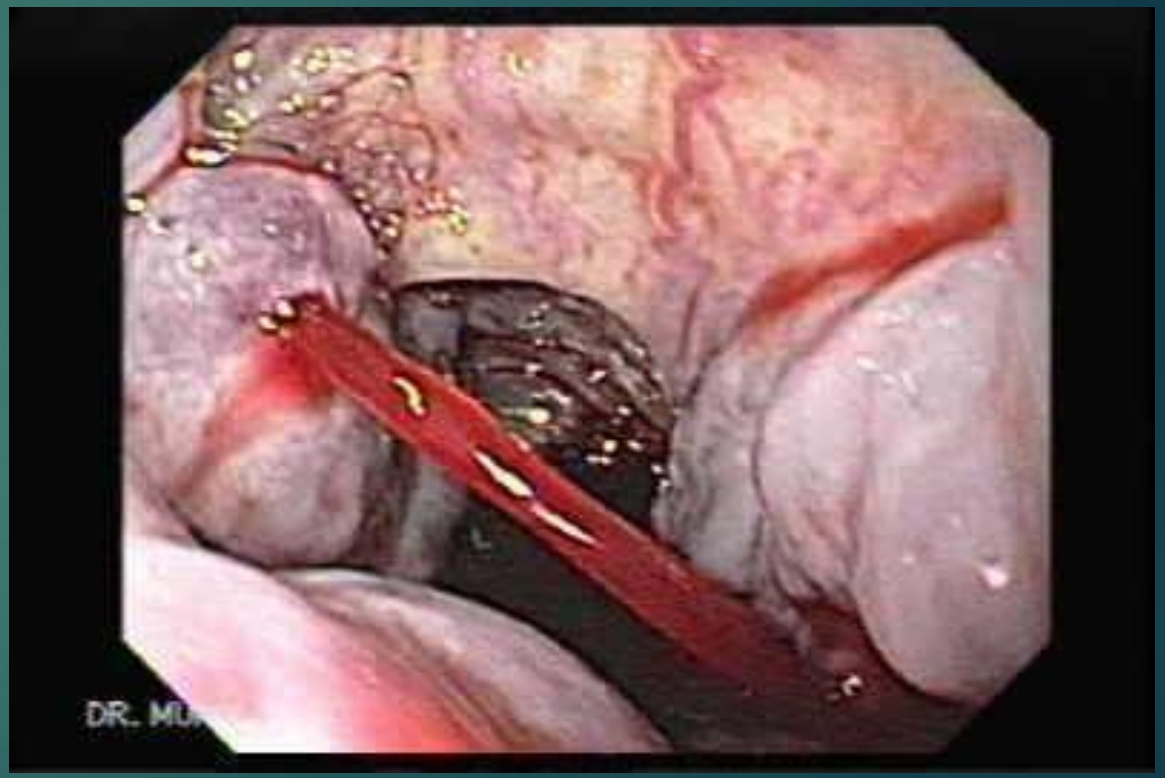
The illustration above depicts a free flap, in which the tissue is cut free from its original location and reattached in the chest area.

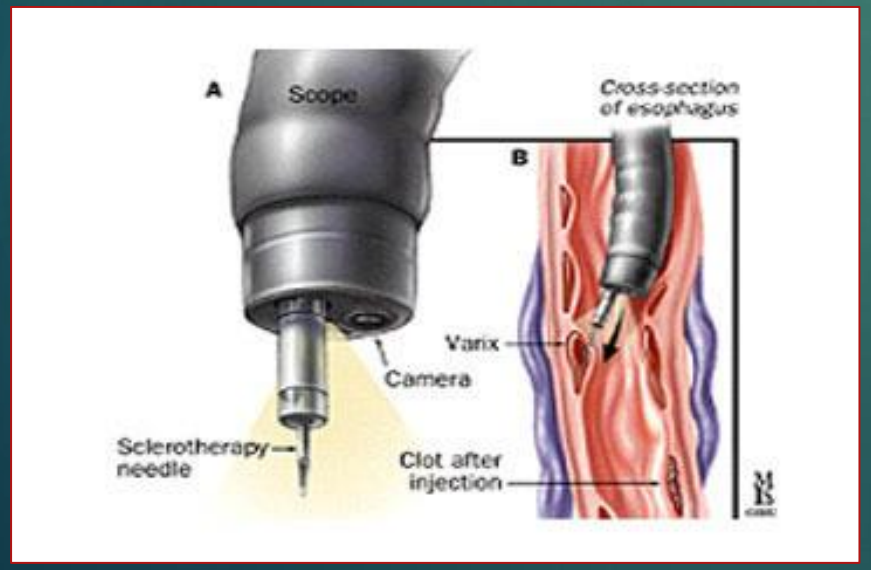
15. **REPLANTATION**: reimplantation of a traumatic detached extremity or organ



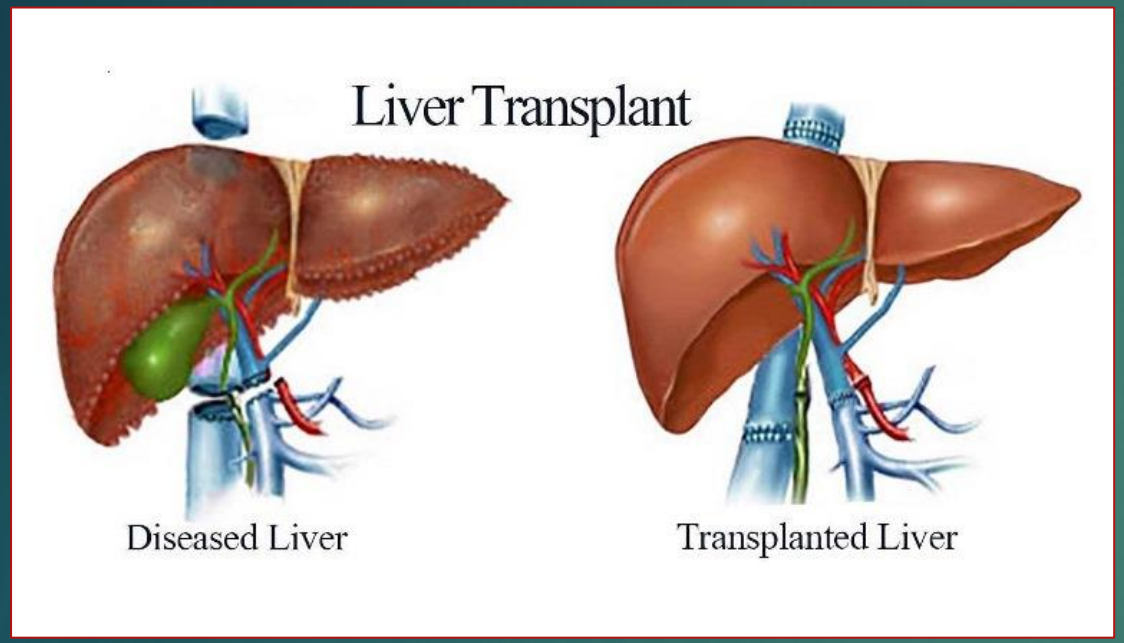
16. **SCLEROTISATION**: to close varicouse veins with perivascular injection

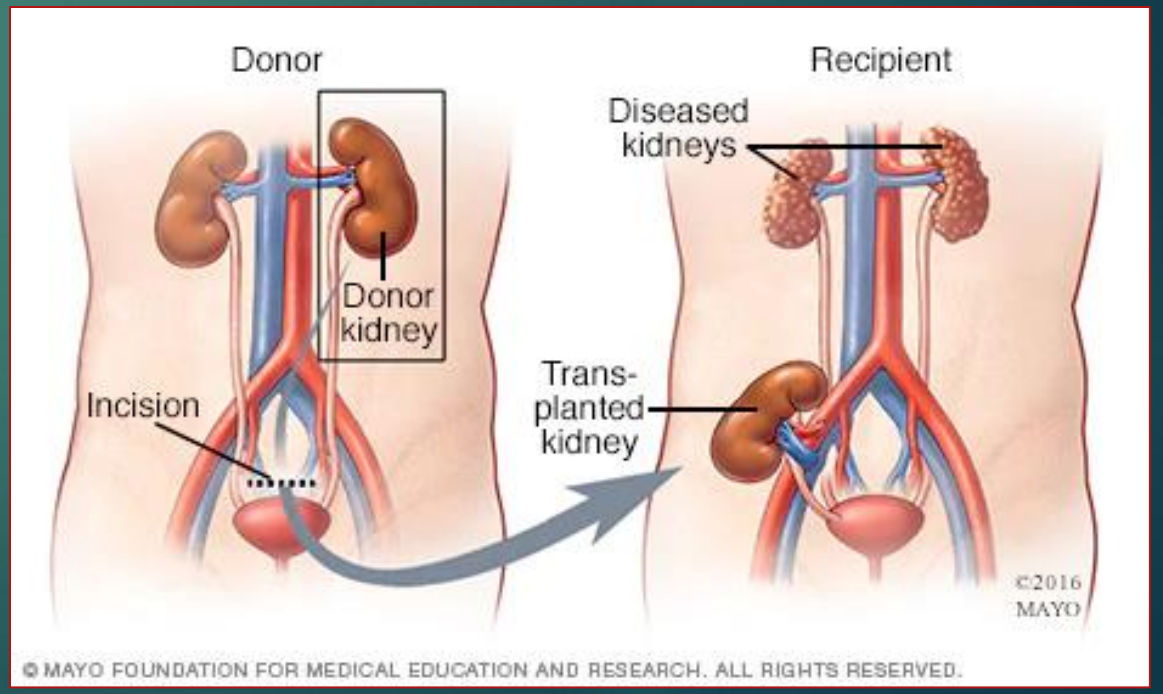






17. TRANSPLANTATION





PREOPERATIVE PREPARATION

- ANAMNESTIC DATA COLLECTION, SURGICAL EXAMINATION

INDICATION for Surgery

- INVESTIGATIONS: blood test, imaging ex., endoscopy, etc.
- ANAESTHESIOLOGICAL EXAMINATION
- ***ESTIMATION OF PERIOPERATIVE RISK***
  - **PATIENT-RELATED FACTORS**
  - **PROCEDURE-RELATED FACTORS**

PATIENT-RELATED FACTORS

- ANAMNESTIC COMORBIDITIES: CV, PULMONARY, DM
- MEDICAL History:
  - Haemostasis modification:
    - PLT-aggregation
    - Anticoagulants
  - Blood sugar level modification: OAD, INSULIN
  - ALLERGY
- IMMUNE STATUS
- NUTRITIONAL STATUS
- Smoking, Alcohol, Drugs

PATIENT-RELATED FACTORS:

NUTRITION STATUS

- Preoperative nutrition (if possible, electively/semielectively):
  - Potential Weight loss > 10-15%, but sometimes a need before surgery
- Postoperative nutrition: if the patient is unable to take in normal diet for 7 or more days'
- ENTERAL NUTRITION
- TOTAL PARENTERAL NUTRITION (TPN)
  - 10 days

PROCEDURE-RELATED FACTORS

- **LOW RISK**: poses minimal physiological stress and risk to the patient, rarely requires blood transfusion, invasive monitoring or intensive care.
  - groin hernia repair, cataract surgery, arthroscopy, breast surgery

- **MEDIUM RISK**: moderate physiological stress (fluid shifts, cardiorespiratory effects) and risk; usually associated with minimal blood loss; potential for significant problems must be considered, appreciated
  - laparoscopic cholecystectomy, hysterectomy, hip replacement

- **HIGH RISK**: significant perioperative physiological stress; often requires blood transfusion or large fluid volumes; requires invasive monitoring and will often need intensive care
  - aortic/heart surgery, major gastrointestinal resections, thoracic surgery

PROCEDURE-RELATED FACTORS

Type of procedure	Definition	Wound infection rate (%)	Example	Need for prophylaxis
Clean	Atraumatic; no inflammation encountered, no break in technique; gastro-intestinal, genitourinary and respiratory tracts not entered	1.5–4.2	Inguinal hernia repair	Not usually required
Contaminated	Gastro-intestinal or respiratory tract entered but without spillage; oropharynx, appendectomy, sterile genitourinary or biliary tract entered; minor break in technique	<10	Cholecystectomy (no spillage)	Usually required
Clean-contaminated	Acute inflammation; infected bile or urine; gross spillage from gastro-intestinal tract; major lapse in technique; fresh traumatic wound (12–24 h)	10–20	Appendicectomy	Required
Dirty and infected	Established infection; transection of clean tissues to enable collection of pus; traumatic wound with retained devitalised tissue; faecal contamination; delayed treatment	20–40	Sigmoid colectomy (Hartmann's procedure) for faecal peritonitis	Treatment required (not prophylaxis)

ASEPTIC

CLEAN

Facultative contaminated

Contaminated

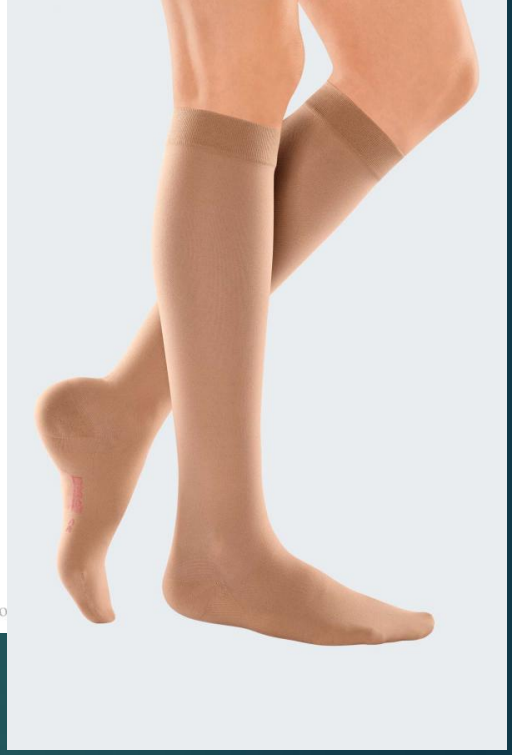
Strongly contaminated

ANTIBIOTIC PROPHYLAXIS

- **WHEN?**
  - **PATIENT:**
    - Immunodeficient, Immunosupressed, Immunocompromised
    - Immunocompetent (ex: endocarditis, implantation)
  - **PROCEDURE**
    - **Clean**
    - Clean-contaminated
    - Contaminated
    - Dirty
- **WHAT kind of antibiotics?**
  - Against Gram positive, Gram negative, anaerob agents

VENOUS THROMBO-EMBOLISM

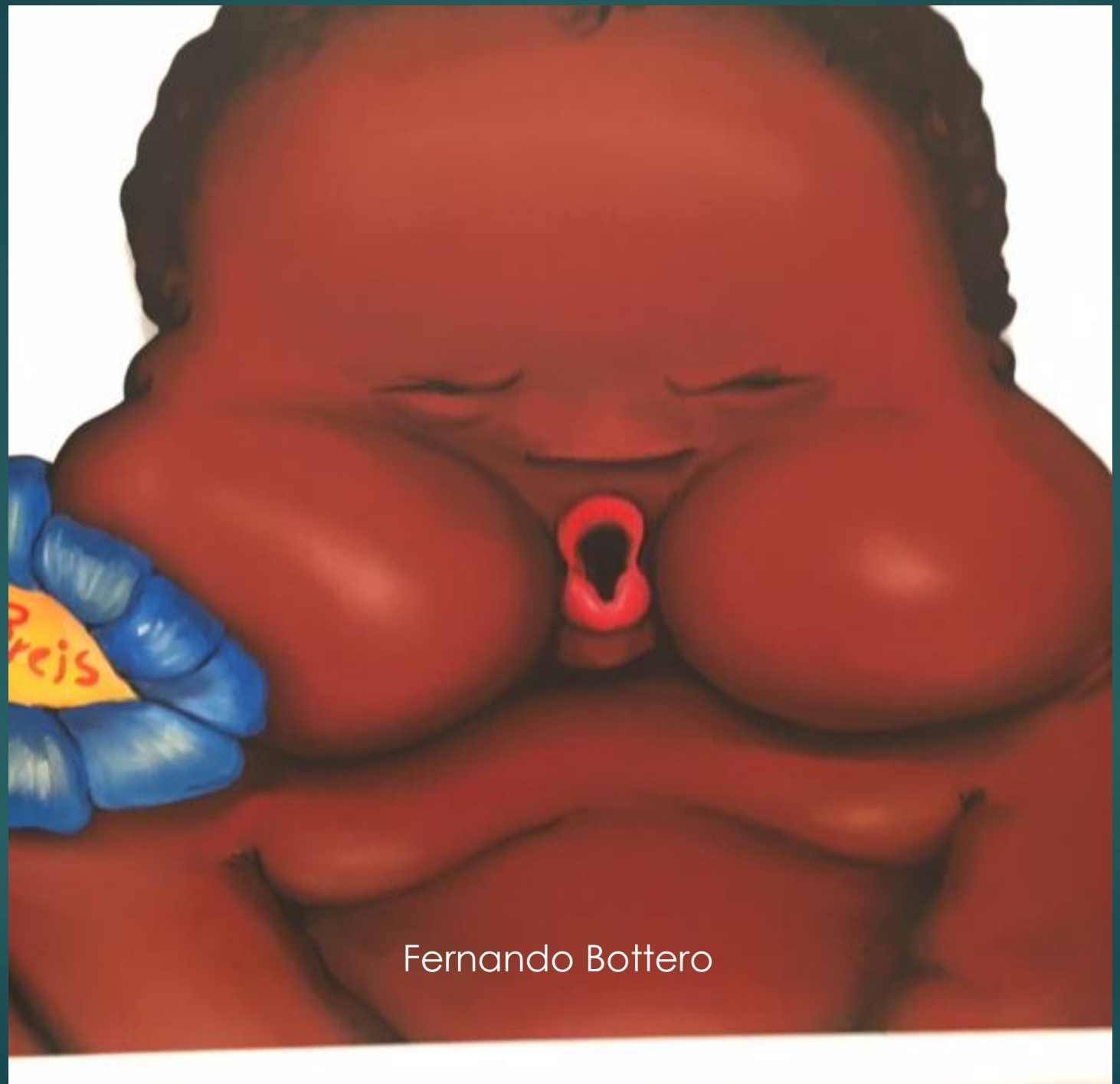
- **PREVENTION METHODS**
  - Graduated compression stockings
  - Mechanical calf compression device
  - Heparin
    - Unfractionated (iv.)
    - **L**ow**M**olecular**W**eight**H**eparine (sc.)



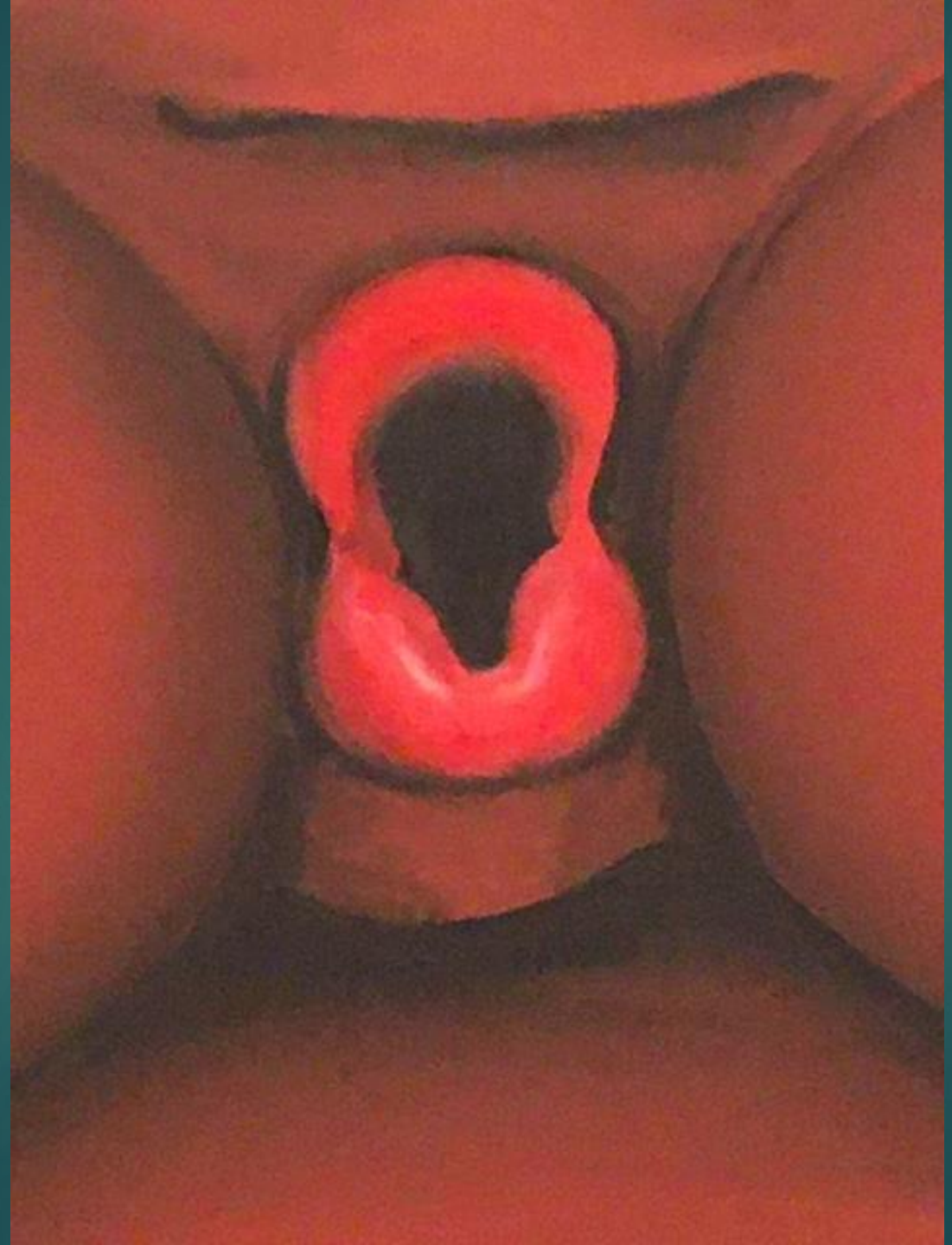
POSTOPERATIVE COMPLICATIONS

- **GENERAL**
  - Cardiovascular problems
  - Fluid balance (oliguria, hypo-/hypernatraemia, hypo-/hyperkalemia)
  - Respiratory insufficiency
  - Confusion

- **SPECIFIC**
  - HAEMORRHAGE
  - PYREXIA
  - VOMITING
  - GUT FUNCTION
  - WOUND FAILURE



Fernando Bottero

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