Surgery of hernias

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Definition:

A hernia is where an internal part of the body, such as an organ, pushes through a hereditary or acquired weakness in the muscle or surrounding tissue wall.
The hernia repair is one of the most common surgical procedures in the world.

US: 600000/y
HU: 300000/y
Bassini 1887

• The modern era of the surgery
  – Asepsis, anesthesia
Use of implants and xenograft

- 1894. Phelps silver filigree
- 1949 PTFE-DuPont
- 1955 Gerendás Mihály: fibrin layer from animals, (Biethium)
- 1965 Horn B, Drobny S: gynecological application and liver surgery
Types of hernias and distribution

- Inguinal hernia: 80%
- Femoral hernia: 10%
- Rare hernias: 5%
- Umbilical hernia: 5%
Anatomy

1. Hernia gate (ring)

2. Hernia sac (NB.: par glissement hernia)

3. Content
Anatomy

No disease of the human body, belonging to the province of the surgeon, requires in its treatment a better combination of accurate, anatomical knowledge with surgical skill than Hernia in all its varieties.

Sir Astley Cooper, 1804
Inguinal hernia

Type:

- **Indirect, lateral**
  - congenital
  - acquired

- **Direct**
Inguinal hernia

Pathogenesis:

- Metabolic disorders
- Impaired collagen synthesis
- Weakness of connective tissue
- Increased abdominal pressure pushes out the abdominal content through the weak part
Childhood risks

- Premature birth
- Cryptorchism
- Hypospadias
- Epispadias
- Failure in genital development
- Peritoneal dialysis, ascites
- Abdominal wall defect
- Positive anamnesis in family
- Cystic fibrosis
- Connective tissue disorders
- Mucopolysaccharidosis
- Dislocated hip
- Ehlers-Danlos syndrome
- Marfan syndrome
- Fetal hydrops
- Ascites / liver disease
- Ventriculoperitoneal shunt (hydrocephalus)
Inguinal hernia

Treatment = Operation

(conservative treatment is acceptable only at contraindication of surgery)
Before you start... OBJECTIVES

1. Identify pertinent external landmarks in the inguinal region for use in herniorrhaphy

2. Understand the layers of the abdominal wall and their relationship to the inguinal canal

3. Define all of the components of the inguinal canal and spermatic cord

4. Describe the etiology of groin hernias by defining potential weak areas of the inguinal and femoral canal

5. Describe the anatomic basis for hernia repair
Inguinal hernia

Steps:

1. Dissection of hernia sac
2. Inspection of the content, replacement
4. Abdominal wall repair
Inguinal hernia

TECHNIQUES:
(difference in the abdominal wall reconstruction)

• Traditional (tension repair): (Bassini, Girard, Bassini-Kirschner, Shouldice)

• Tension Free Repair: with mesh
  (Lichtenstein, Trabucco, Stoppa, plug reconstruction, laparoscopic approaches)
Rare hernias

- Obturator hernia
- Lumbar hernia
- Sciatic hernia
- Perineal hernia
- Spiegel hernia
- Littre hernia
- Richter hernia (localisation independent)
Rare hernias

Internal hernias
(both gate and sac are located in the abdominal cavity)

• Mesenterico-parietal hernia
• Paraduodenal hernia
• Hernia bursae omentalis
• Pericoecal hernia
Sliding hernia (par glissement)

- in which the intestinal wall forms part of the hernial sac and the rest of the sac is formed by parietal peritoneum
Diagnosis

• Case history

• Physical investigation:
  – Inspection
  – Sense of feeling, possibility of replacement,
  – Eavesdropping

• US, sometimes CT
Differential diagnosis

- Hydrocele
- Varicocele
- Lipoma
- Lymphoma, lymphadenomegalia
- Tumor or inflammatory process
- Cyst
- Relaxation
Possible complications

• Accrete hernia
• Inflammation
• Constipation, ileus
• Incarceration
  (Richter hernia, retrograde incarceration, risk of taxis(spontaneous repositioning))
Surgery of inguinal hernia

Distribution of open surgery

Western Europe
- Tension free: 60%
- Traditional: 40%

Hungary
- Tension free: 29%
- Traditional: 71%
Surgery of inguinal hernia

Laparoscopic vs. open surgery

Western Europe
- 89% Open
- 11% Laparoscopic

Hungary
- 98% Open
- 2% Laparoscopic
Inguinal hernia

Complications:

- Nerve injury (n.ilioinguinalis, n.genitofemoralis)
- Vascular injury (a., v.femoralis, epigastrica inferior, spermatica)
- Vas deferens injury
- Injury of bladder
- Intestinal injury
- Scrotal edema, hematoma
- Suppuration
- Testicle atrophy
Inguinal hernia: Postoperative care

General wound care

Limited physical activity

– Normal work load
  • Up to 2 month after traditional surgery
  • 2 weeks after tension free repair
  • Few days after minimal invasive reconstruction
Inguinal hernia

Reoccurrence (1-15%)

Frequency depends on:

– Surgery type
– Skills and technique of the surgeon
– Overall condition of the patient
– Events in the postoperative period
Femoral hernia

Anatomy:
- under the Poupart ligament
- lig. lacunare Gimbernati
- lig. ilipectinea Cooperi
- trigonum Hesselbachi (N A V E - nerve-artery-vein-empty space)
- Rosenmüller lymphnodes

Forms, properties:
- Always direct hernia
- Always acquired
- More common in female
- Incarceration is frequent

(Keep it in mind especially in case of old patients)
Femoral hernia

Therapy = Surgery

1. Femoral approach (Fabricius)

2. Inguinal approach (Lotheisen, Lotheisen-Reich)
Umbilical hernia

Anatomy, pathogenesis:
- Umbilical hernias - occur when fatty tissue or a part of intestine pokes through abdominal wall near the navel (belly button)
- Insufficient closure of umbilical ring
- Weakening umbilical scar

Treatment
- The umbilical hernia of infants and children can close up to the age of 2 years
- If not = surgery
- Umbilical hernia in adults = surgery

Forms
- Congenital in children (spontaneous closure before the year 1.)
- Always acquired in adults (increased physical load, pregnancy, obesity, ascites)
- The risk of incarceration is high

Surgical strategy:
- Children
  - Navel preserving reconstruction
- Adult:
  - Navel preserving reconstruction
  - Mayo
  - Mesh implantation
  - Minimal invasive surgery
Hernia in linea alba

• EPIGASTRIC hernias develop in the mid upper abdomen, anywhere along a line drawn from the lower point of the breastbone straight down to the Umbilicus.

  – can occur at any point along
  – small in size and localized
  – contents are easily pinched and these hernias therefore can cause a great deal of pain.
  – well suited for repair using a Tension Free method
Hernia in linea alba

• DIASTSIS RECTI is not a hernia
  – Often confused and at times mis-diagnosed as an epigastric hernia
  – Abdominal wall protrusions that occur due to a widened band of non-contractile fascia or tendon normally present between the rectus muscles
  – This non-tender bulge extends from just below the breast bone, down to the navel.
  – There is no pain associated with
  – Surgery is not necessary except for cosmetic reason
Incisional hernia

- Frequently combined with wound healing alterations (suppuration, fascia necrosis, hypoproteinemia, hypovitaminosis, hematoma)

- Therapy: reconstruction
  Important: tension free methods improve the success rate, therefore mesh implantation necessary in case of big aperture and extended tissue defect.
Ventral hernia

Frequency after laparotomy: 3-20%

Minimal invasive approach: 1-4%
Ventral hernia

Traditional: open, sutures (reoccurrence: 41-52%)

Tension free: open, mesh (reoccurrence: 12-24%,)

(Infection rate 20%-t)

Laparoscopic repair (1992, LVHR (Todd Heniford at all))
Incisional hernia

- High incidence of reoccurrence
- Mesh is useless in septic condition
- Giant hernia repair may lead to have respiratory and cardiac failure
Incisional hernia

Open surgery

Western Europe
- Tension free 34%
- Traditional 66%

Hungary (11000/év)
- Tension free 66%
- Traditional 34%
Ventral / incisional hernia

Reoccurrence

Withouth mesh
25-52%

With mesh
0-10%

R.o.  complication  3.4%

Mesh implantation

- Less reoccurrence
- Less pain
- Early mobilization, and physical load

- More complication
- Infection, seroma, hematoma
- Shrinkage, migration
- Discomfort (chronic pain, feel of mesh)
Factors that influence the integration, and complications:

• Amount of foreign materials
  • The amount of implants correlate with
    • Seroma
    • Wound infection
    • Chronic pain (granuloma)
    • Other tissue reactions
    • (20 x 30 cm mesh = 300 m suture!)

• Quality, rigidity
  • Soft edges cause less complaints.
Factors that influence the integration, and complications:

- Collagen development
  - Impaired development around the mesh
  - Discovered in 74% of recurrent hernia
Parts

Monofilament polypropylene mesh
  • Strong, most frequently used in surgery
  • High pressure tolerance (caught),
  • Porosity – tissue integration
  • Blue stripe - orientation

PDS capsule
  • Absorbable, tiny and flexible glue

ORC
  • Gel formation to prevent adhesion
  • Persist 14 days
  • Vegetable derivate
Application

- Complex abdominal wall repair
- Complex abdominal wall defects
- Parastomal and Hiatus hernia
- Any major tissue defect (e.g. chest wall)
Biocompatible mesh in hernia repair

Expected clinical outcomes
For an optimal repair

- Limited scaring
- Quick integration
- Comfort
- Durability
- Adhesion prevention

The 5 key mesh properties

- Porosity
- Hydrophilicity
- Compliance
- Stability
- Visceral barrier