Abdominal wall hernia

“The history of hernia is the history of surgery” Nyhus, 1995

DIFINITION: Hernia of the abdominal wall or external hernia (*herniae abdominalis externae, ICD-10 K40-K46)* is such surgical disease, which is characterized *by*

protrusion *of the visceral organs from the place of their physiological placement through* ***the natural canals or defects of the abdominal and pelvic wall***.

From a history of medicine

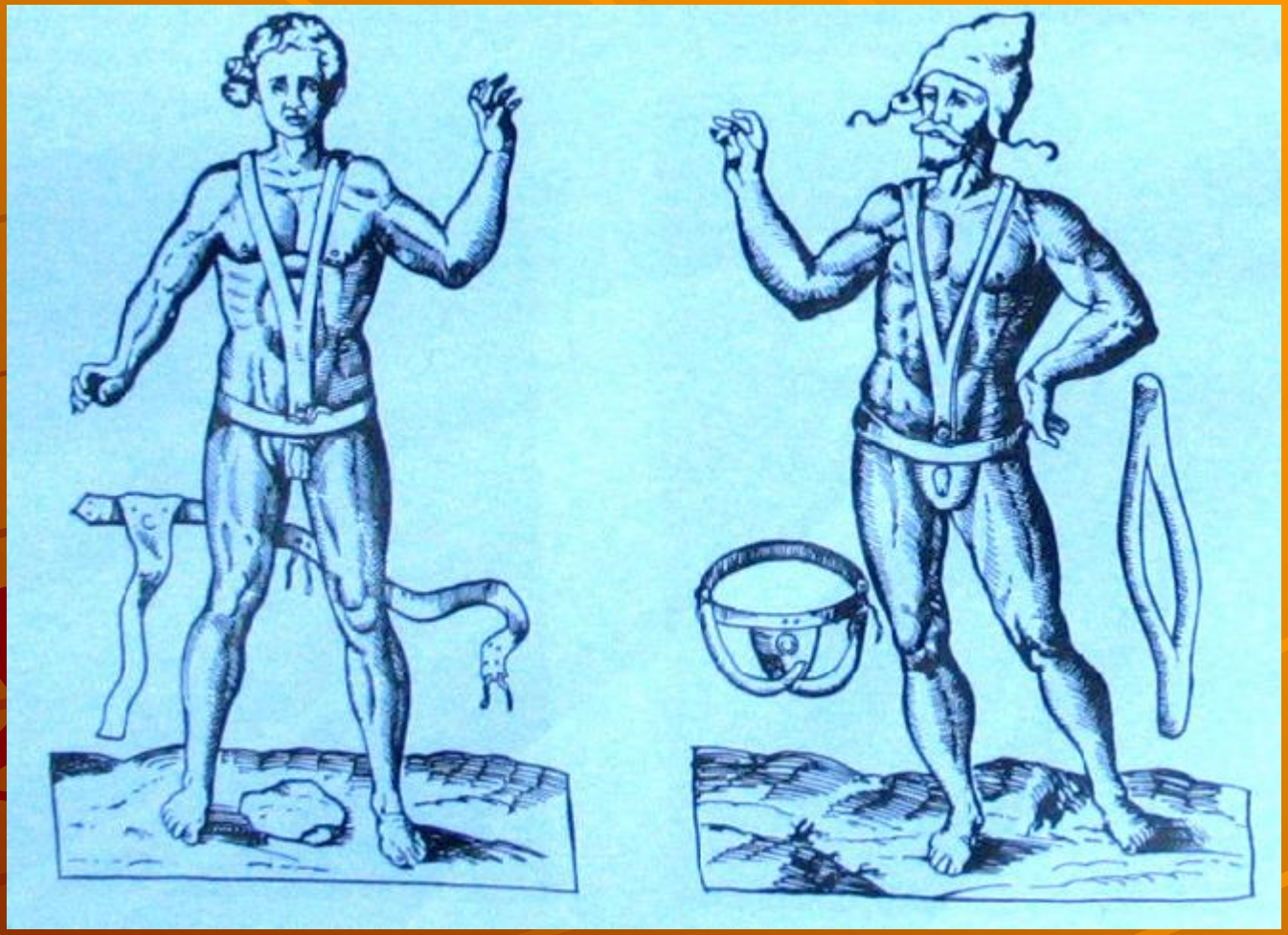
The term "hernia" for the first time was offered by prominent doctor of an antiquity Claudius Galen (129-199 BC). He proposed the concept of an hernia origin. Cl.Galen – was a man of encyclopaedic know-ledge, founder of experimental physiology, anatomist and the surgeon, itself was engaged in medical practice, represented a progressive idea of an antiquity.

From a history of medicine

Cornelius Celsus, the known Roman surgeon (I century BC) has given classical definition of a hernia as protrusion of internal organs ough the congenital or acquired gate and has named this disease as hernia.

He has offered a method transilumination of a scrotum for differential diagnostics incarcereited hernia and hydrocele. Being by the skilful surgeon, he opened a hernial sac and dissected a restraining ring at incarcereited hernia, and contents set into abdominal cavity.

From a history of medicine



Conservative treatment of hernia with the help of bandagee in XI century BC (from the book of Ambroise Pare "The Apologie and Treatise".

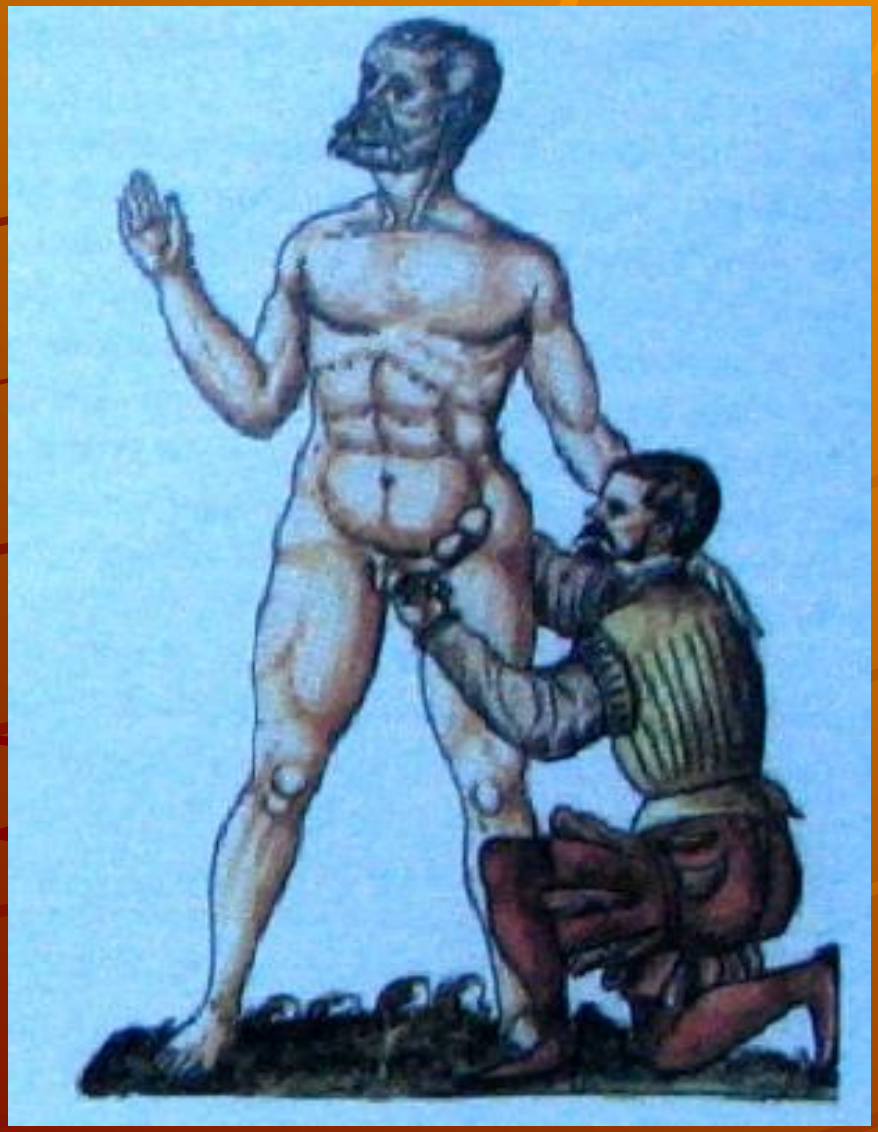
From a history of medicine

Operation herniotomy in the Middle Ages.

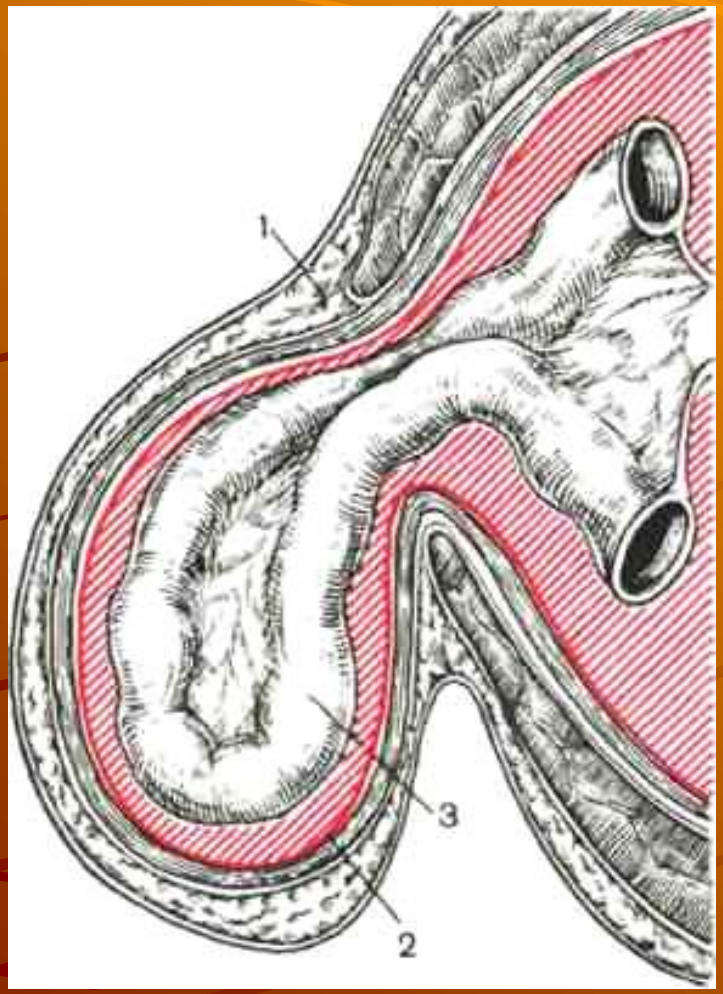
From a history of medicine

The woman with hernia femoralis in epoch of a middle Ages.

From a history of medicine



Investigation of the patient with hernia in epoch of Renessans.

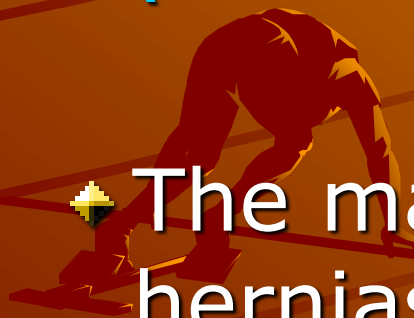


Hernia's elements :

- 1 - neck of a hernial sack;
- 2 – parietal peritoneum – body of a sack;
- 3 - loop of intestine - contents of a sack.

Etiology and pathogenesis

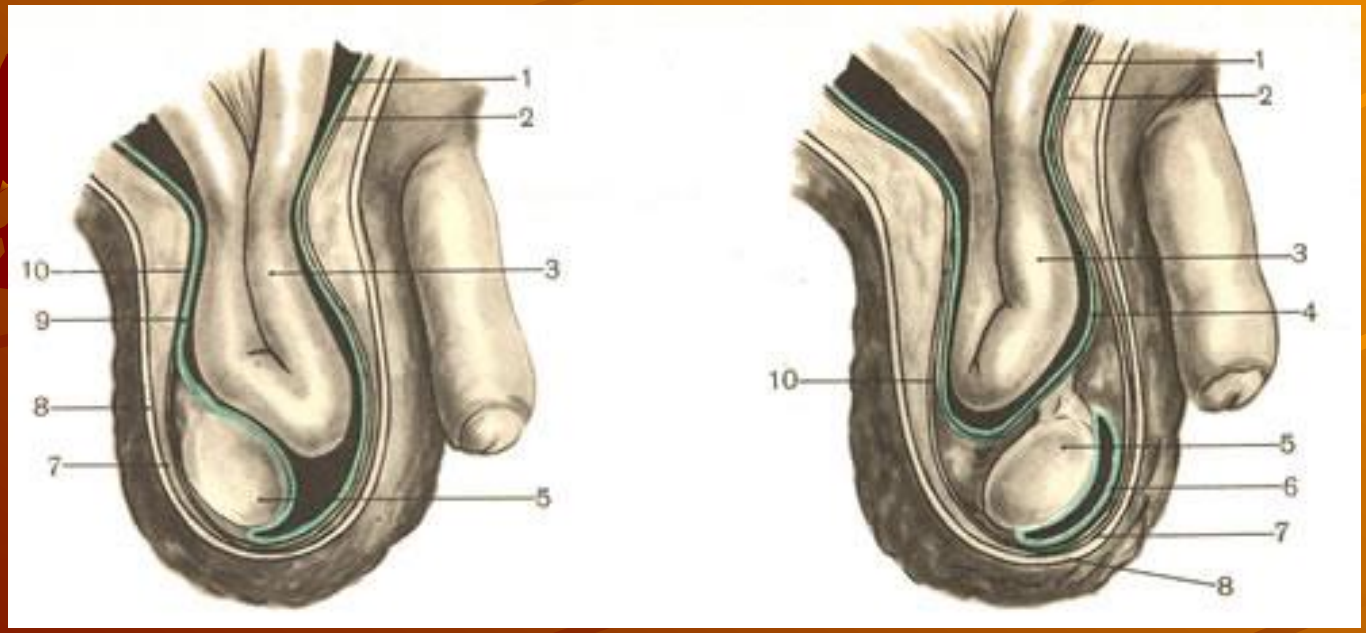
- **Hernias** are divided into two main groups: congenital *(herniae conqenitae – Lat.)* and acquired *(herniae aeguisitae – Lat.).*



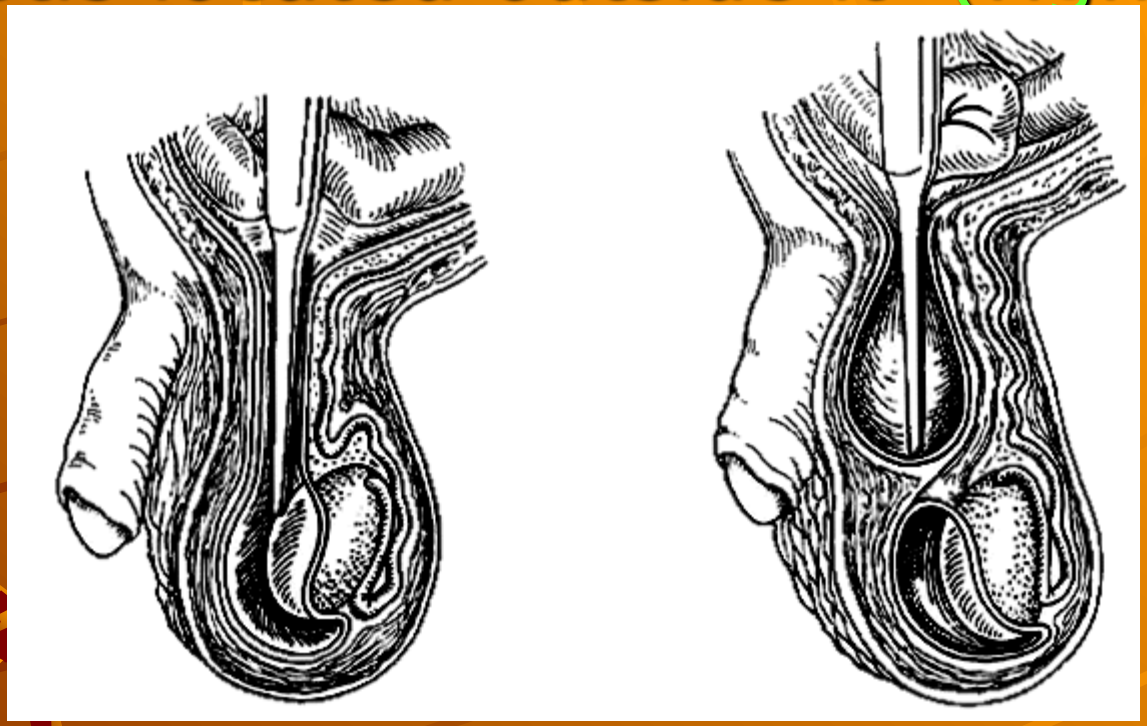
- The main reason of congenital hernias is **malformation**.

- Thus, inguinal hernia arose in case of noclosure of the process of peritoneum, which passes by inguinal channel during descending the testis. On such hernias testis is located in the hernia pouch. Acquired inguinal hernia has hernia pouch and testis located outside it. Many factors are of great importance in the beginning and developing of the acquired hernia.

- **Congenital** inguinal hernia arose in case of noclosure of the process of peritoneum, which passes through inguinal canal during the descent of testis. On such hernias testis is located close upon the hernia pouch (left pict.).



- Acquired inguinal hernia has hernia pouch and testis located outside it (right pict.).



Such reasons, as increased abdominal pressure and weakness of the abdominal wall, cause acquired hernia. That arise after hard physical activity, prolonged cough, constipation, nerve palsy (nerves, which innervate the abdominal wall), injury of muscles or aponeurosis of the abdomen.

The basic symptoms of hernia

1. ***The swelling***, which arises on vertical position of the patient or during rise of intraperitoneal pressure. These can disappear when lying down or on vertical position of the patient after applying small pressure.
2. ***Pain*** in a zone of hernia's sweling at loading.
3. ***Discharge*** of function of internal organs of a abdominal cavity (meteorism, constipation).

Classification

Hernia of the abdominal wall is divided:

Depends on anatomical localization: inguinal (indirect and direct),

midline hernia, omphalocele, femoral hernia, lumbar hernia,

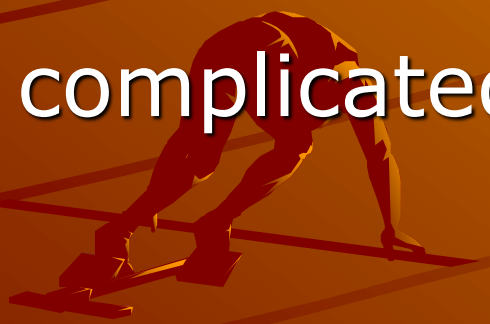
sciatic hernia, (enterischiocele),

lateral hernia,

ischiorectal hernia (perineocele)

Classification

Depends on clinical presentations:
complete and incomplete,
reducible and nonreducible,
traumatic and postoperative,
complicated and noncomplicated.

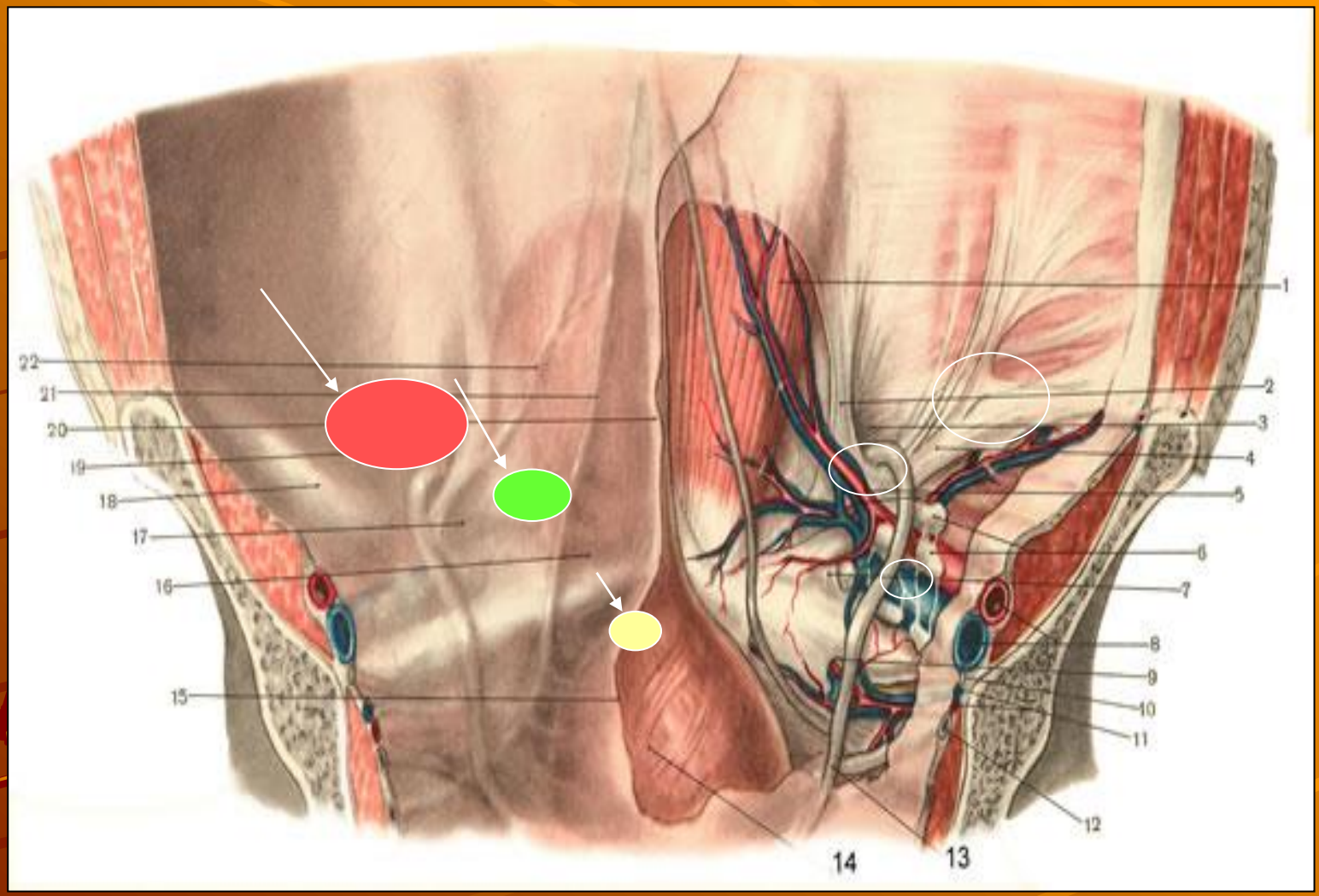


Classification

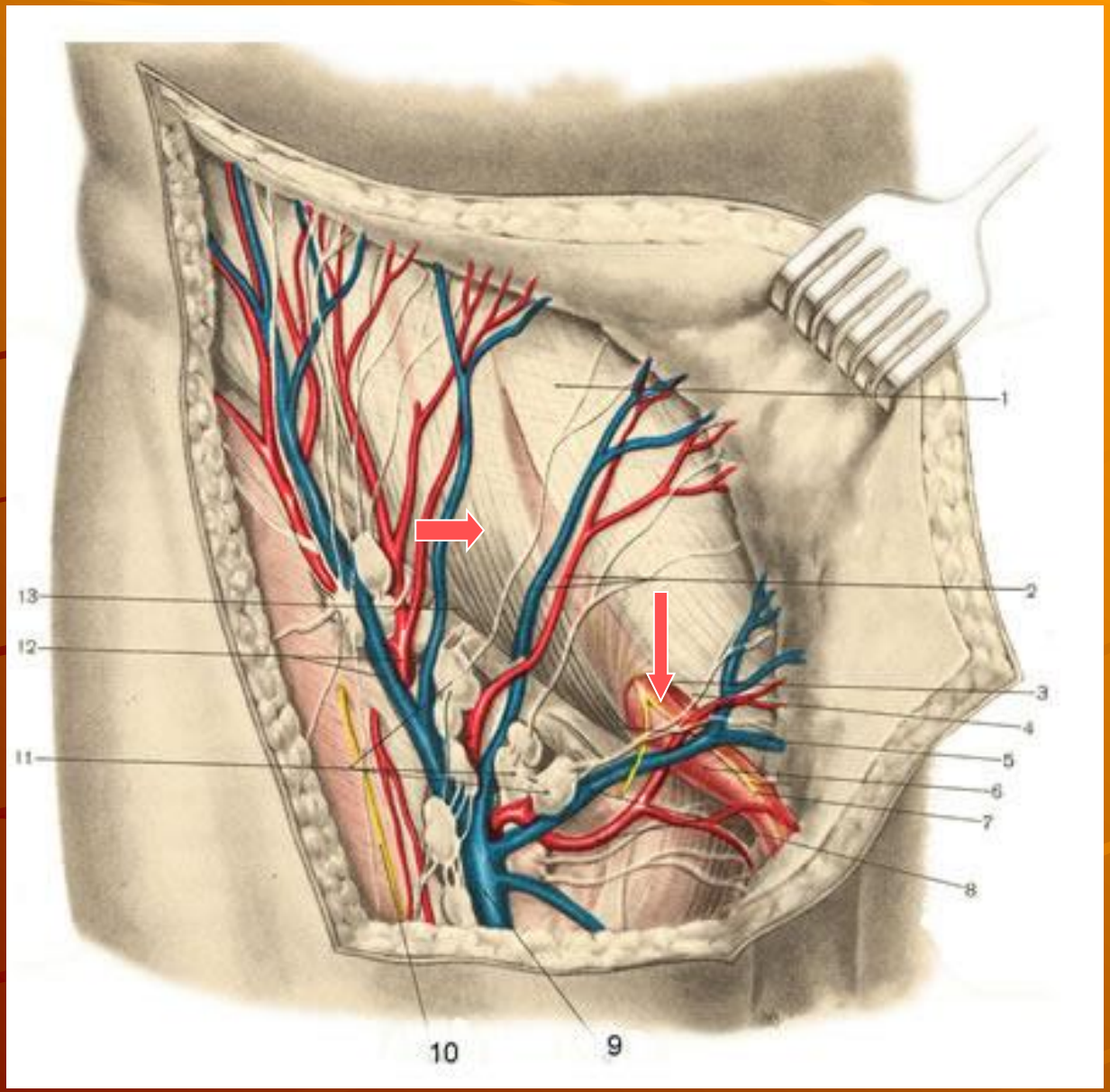
Nyhus hernia classification

- Type 1. Indirect hernia without dilation of the internal ring.
- Type 2. Indirect hernia with dilation of the internal ring.
- Type 3a. (Direct) hernia with backwall defect.
- Type 3b. Indirect hernia with backwall defect (combined hernia).
- Type 3c. Femoral hernia.
- Type 4. Recurrent hernia.

Back surface of the lower department of a forward abdominal wall



1 — m. rectus abdominis; 2 — lig. interfoveolare; 3 — anulus inguinalis profundus; 4 — lig. inguinale 5 — a. et v. epigastrica inferior; 6 — nodules lymph.; 7 — lig. lacunare; 8 — a. et v. iliaca externa; 9 — foramen obturatorium; 10 — n. obturatorius; 11— a. et v. obturatoria; 12 — ureter dexter; 13 — ductus deferens; 14 — ve-sica urinaria; 15 — peritoneum; 16 — fossa supravesicalis; 17 — fossa inguinalis medialis; 18 — lig. inguinale; 19 — fossa inguinalis lateralis; 20 — plica umbilicalis media; 21 — plica umbilicalis medialis; 22 — plica umbilicalis lateralis.

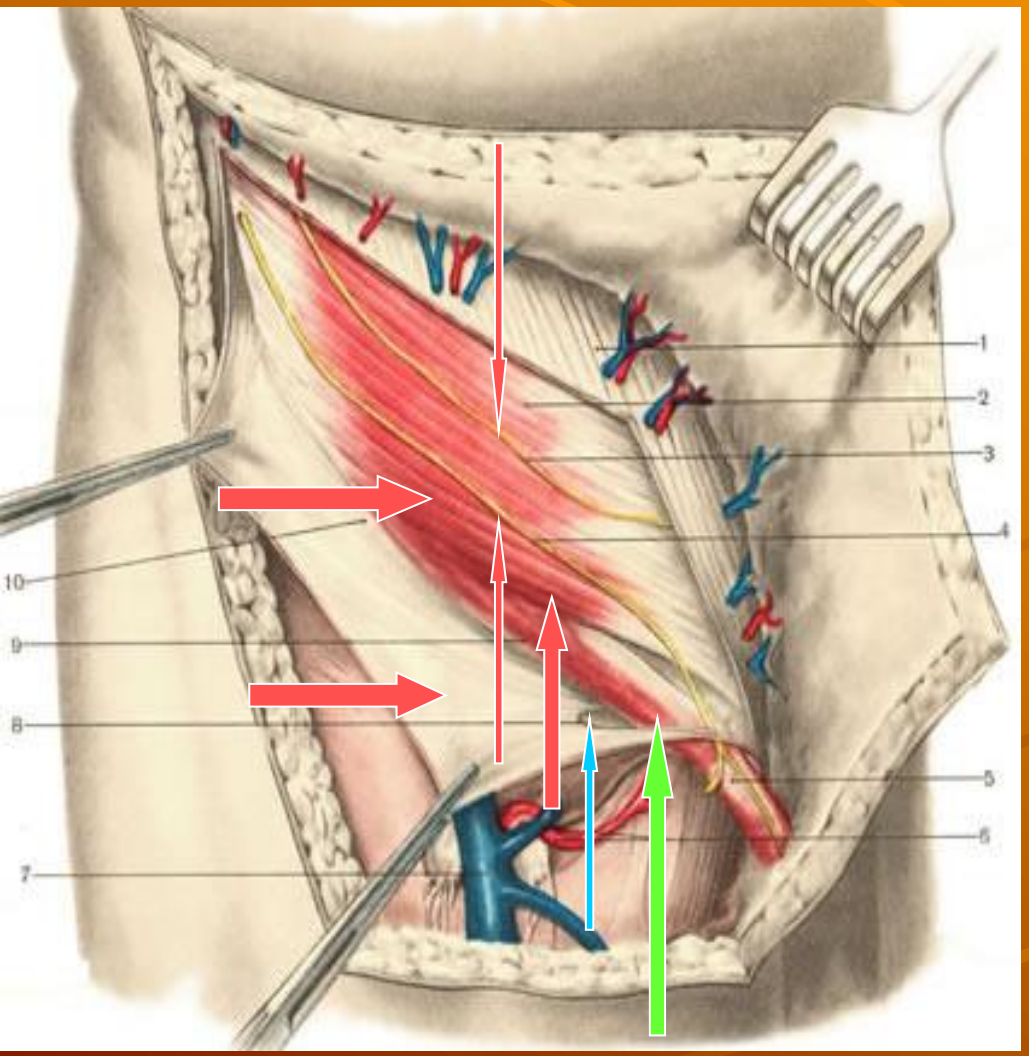


Topography of a inquinal triangle

(I layer):

1-aponeurosis ext. odliq. abdom. muscle; 2- a.and v. epigastr. super-facial.; 3-sperm.duct; 4-crus mediale orifis ext.; 5-crus later. orifis ext.; 6-cremaster m.;7-n.ilioinqui-nal.; 8-a. and v. pudenda ext.

(II layer):



1 — aponeurosis m. obliqui external abdominis; 2 — m. obliquus internus abdominis; 3 — n. iliohypogastricus;

4 — n. ilioinguinalis;

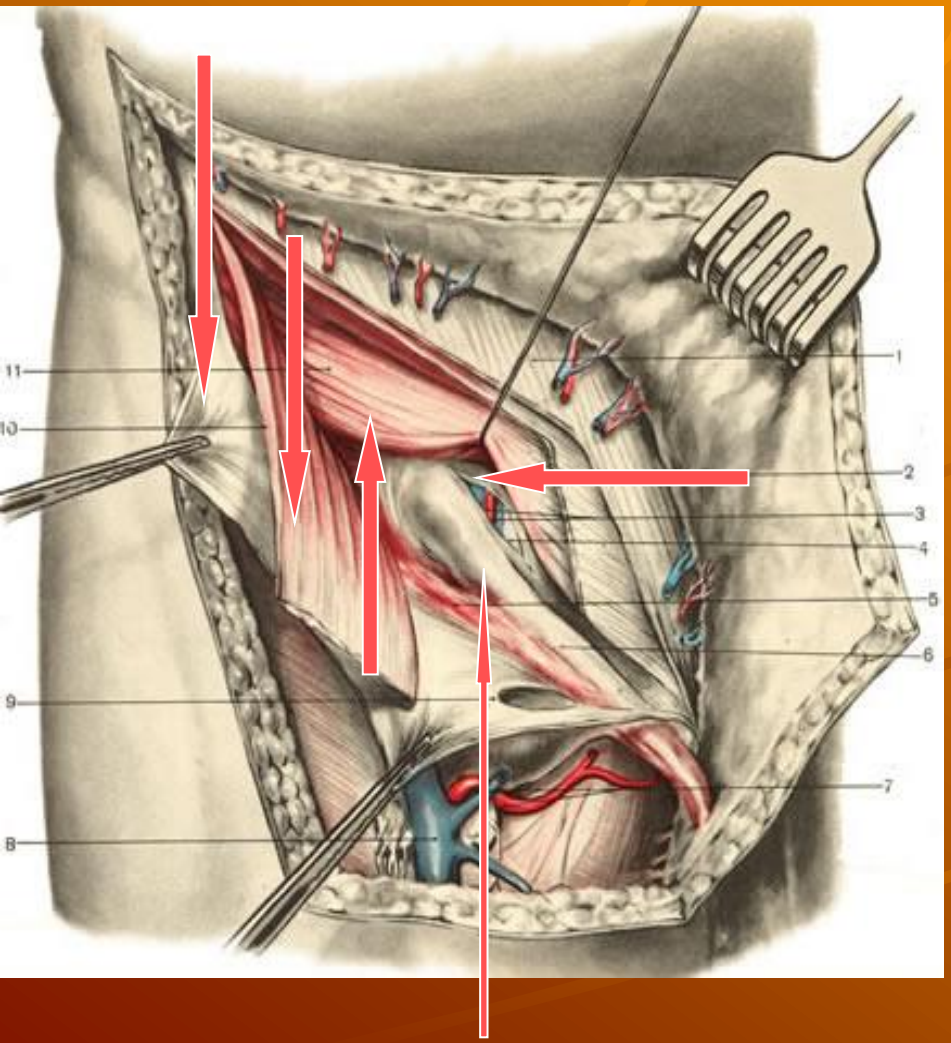
5 —spermatic duct;

6 — a. et v. pudenda externa; 7 — v. saphena magna;

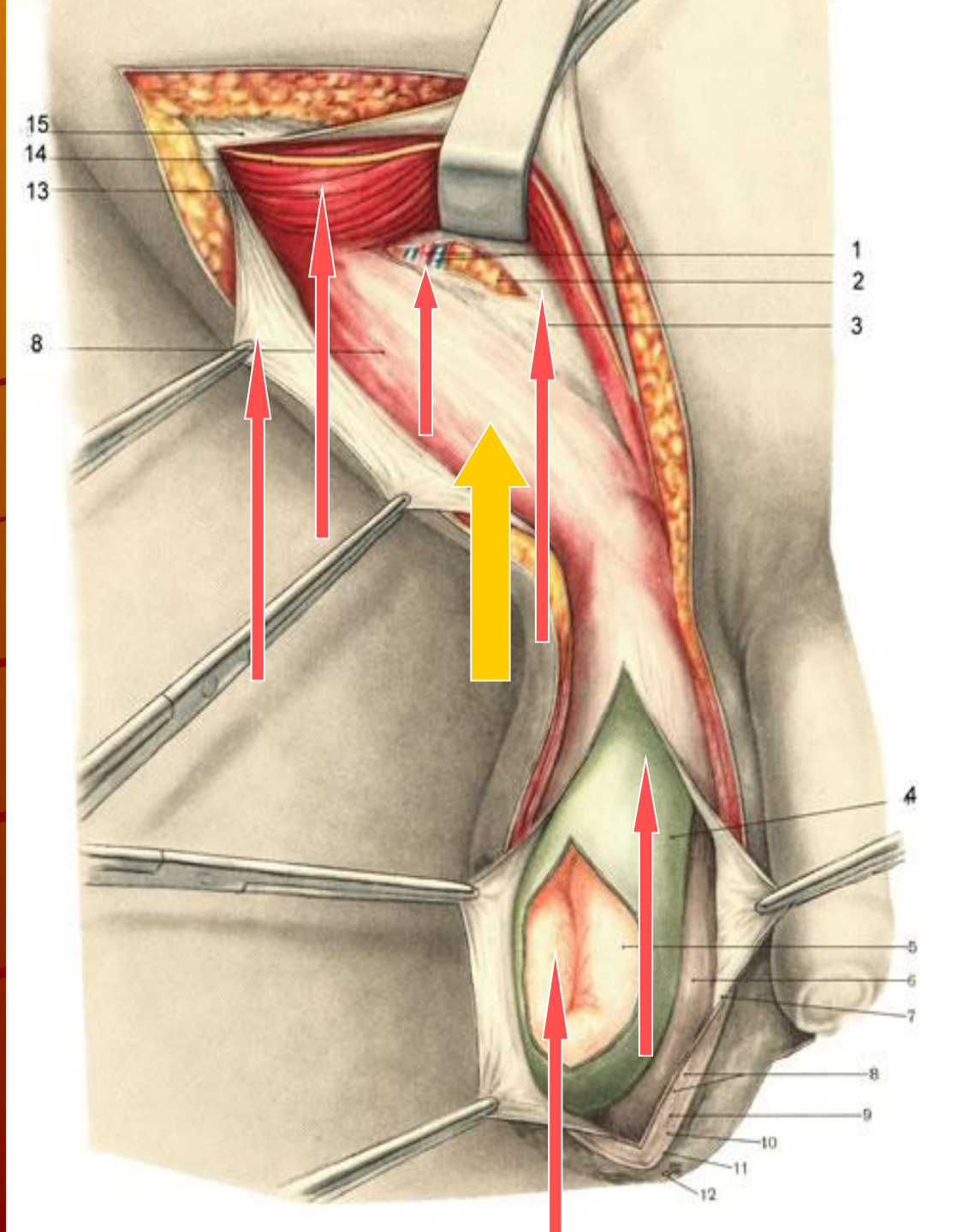
8 — anulus ingui-nalis superficialis;

9 — m. cremaster;

10 — lig. inguinale.



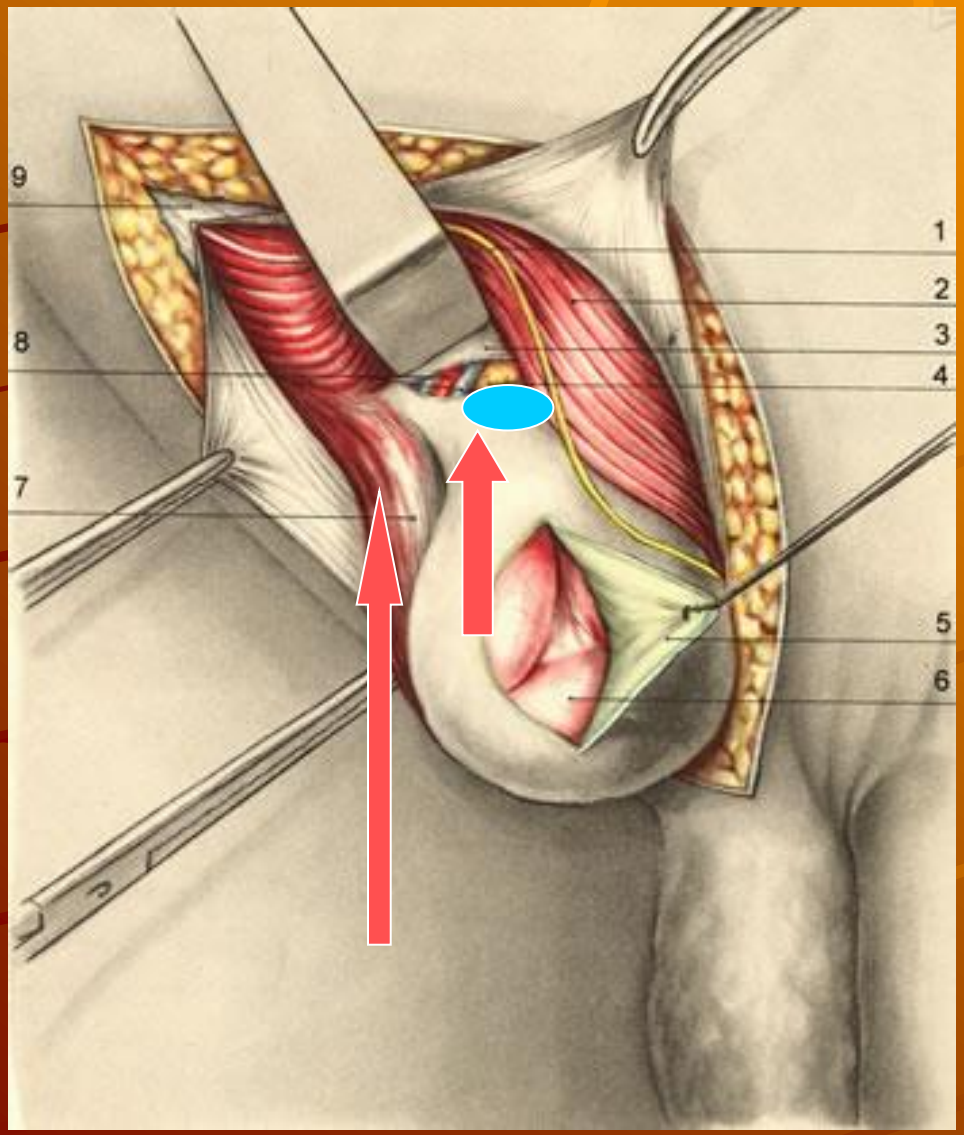
1 — апоневроз m. obliqui externi abdominis; 2 — fascia transversalis; 3 — a. et v. epigastrica inferior; 4 — fatty tissue; 5 — m. cremaster ; 6 — funiculus spermaticus; 7 — a. et v. pudenda externa; 8 — v. sa-phena magna; 9 — anulus inguinalis supernciafis; 10 — m. obliquus internus abdominis (partially is cut off); 11 — m. transversus abdo-minis.



Topography of ecquired oblique inquinal hernia:

1 — a. et v. epigastrica inferior; 2 — fatty tissue; 3 — fascia transversalis; 4 — hernial sac; 5 — small intestine; 6 — tunica vaginalis testis; 7 — fascia spermatica int.; 8 — fascia cremasterica end m. cremaster; 9 — fascia spermatica ext.; 10 — tunica dartos; 11 —skin; 12 — scrotum ; 13 — m. obliquus internus abdominis; 14 — n. ilioinguinalis; 15 — aponeurosis of m. oblique externi abdominis.

Topography of direct inquinal hernia:



1- n.ilioinquinalis;

2- obliq. and transv. abdom. m.;

3-transvers. fascia;

4- a. and v. epigastr. inf.;

5-hernial sac;

6- loop of intestine;

7-spermatic duct;

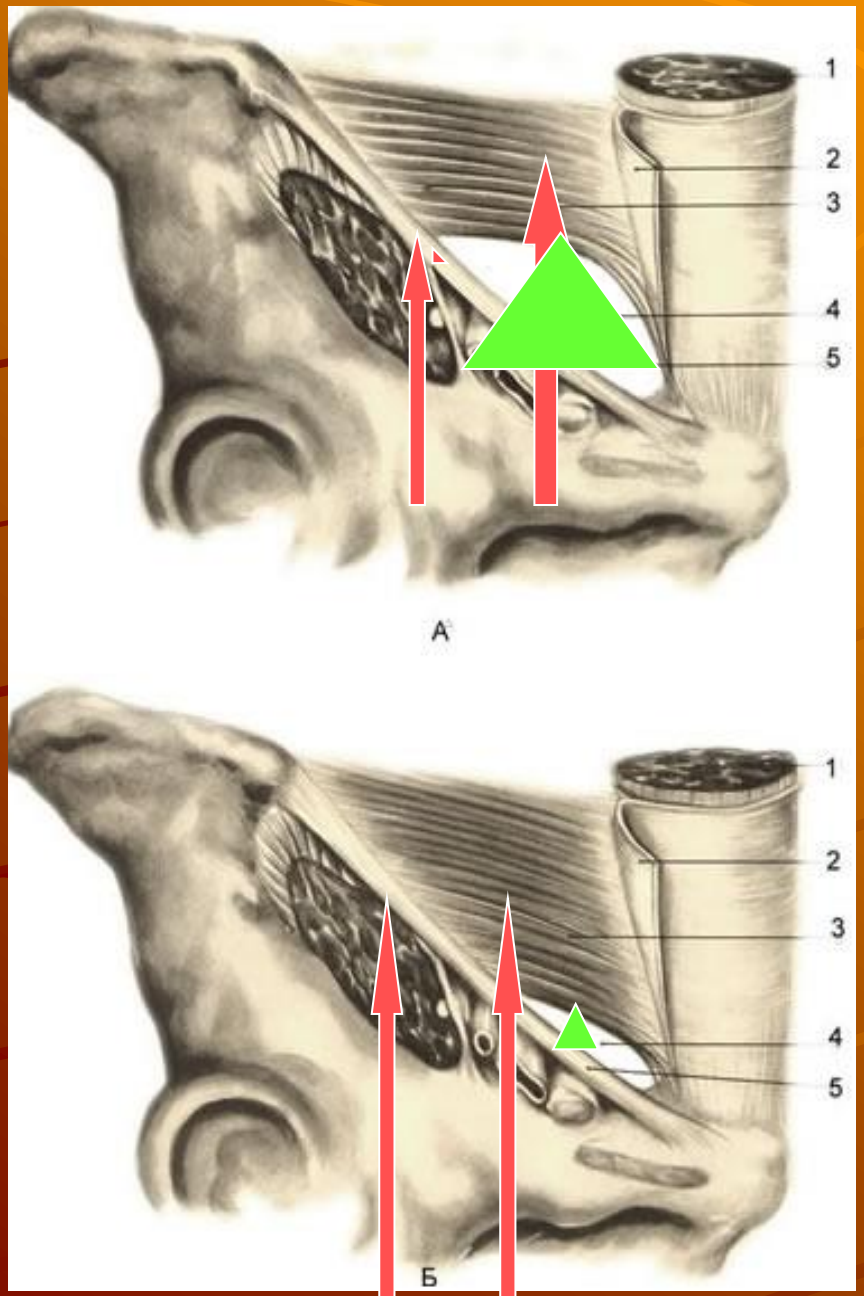
8- lig.inquinalis;

9-aponeuros. ext. odliq. abdom m.

Example from practice

Advanced right-hand direct inqunal hernia and large left-side oblique inquinal hernia (own observation)

The inquinal interval:
A — the triangular form;
B — the crack-like form



1 — m. rectus abdominis;

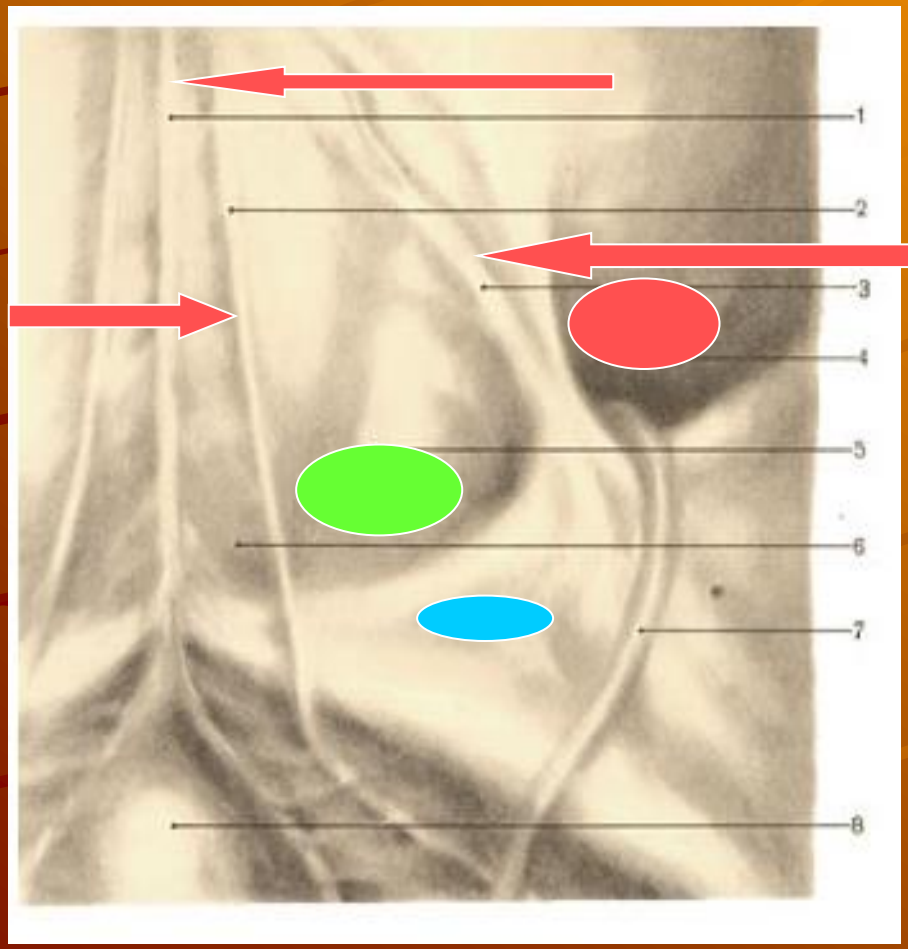
2 — aponeurosis m. obliqui externi abdominis;

3 — mm. obliquus internus abdominis et transversus abdominis;

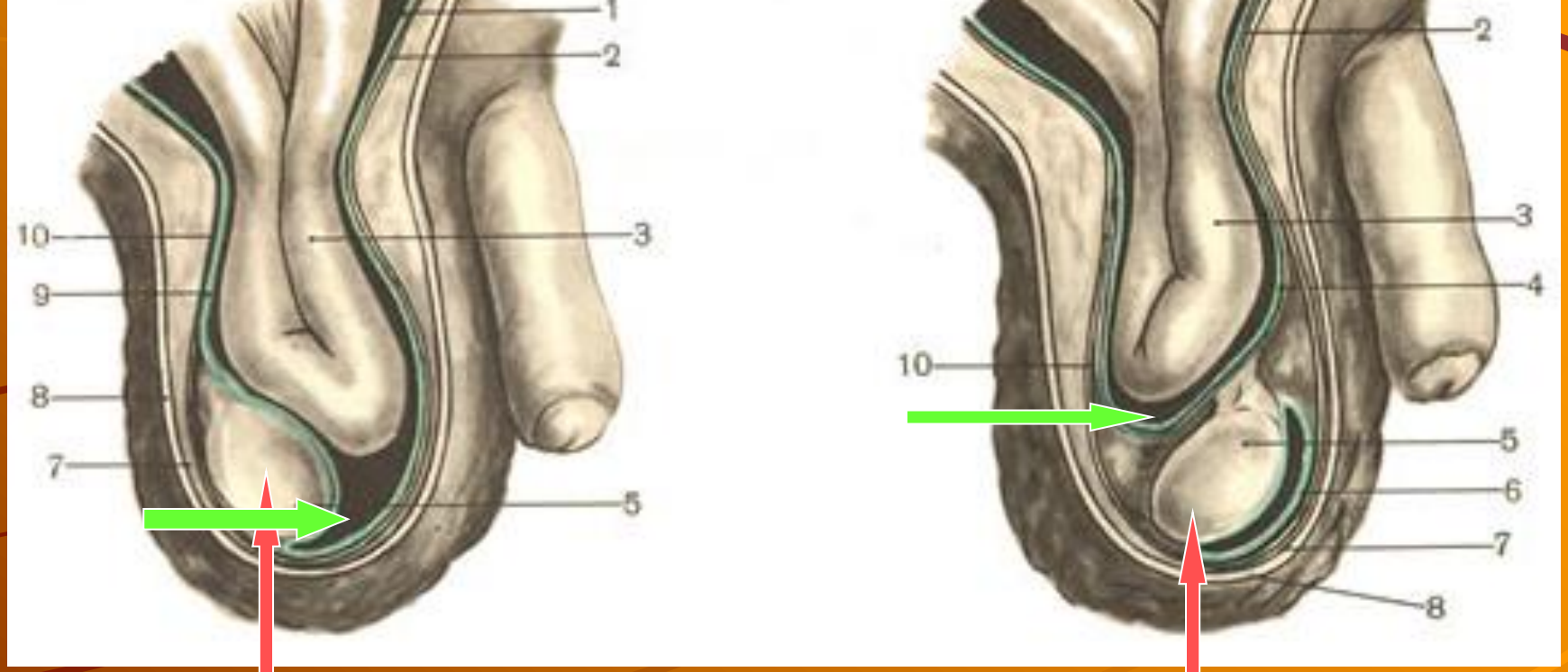
4 — the inquinal interval;

5 — lig. inguinale.

Back image of a abdominal wall



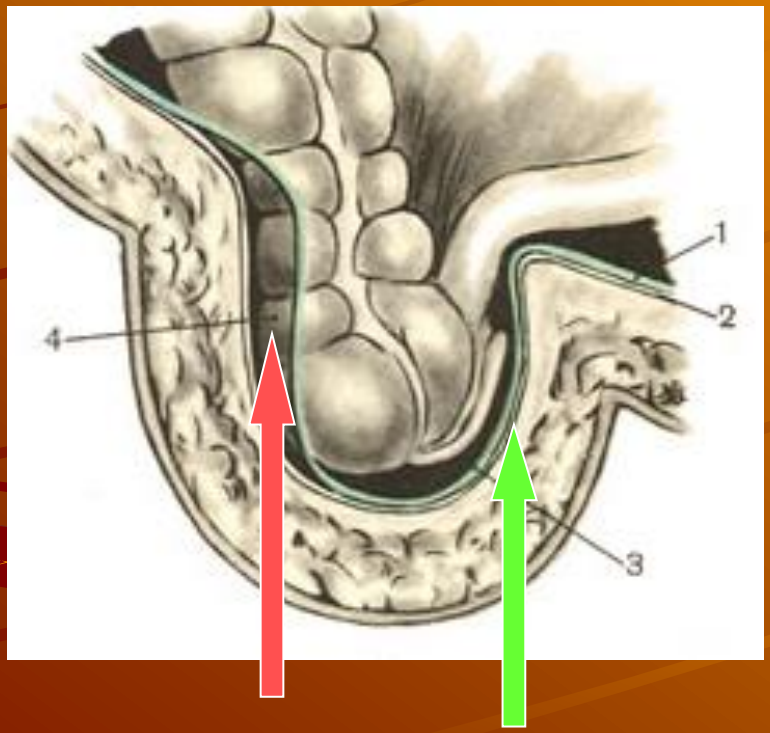
1 — plica umbilicalis mediana;
2 — plica umbilicalis medialis;
3 — plica umbilicalis lateralis;
4 — fossa inguinalis lateralis;
5 — fossa inguinalis medialis;
6 — fossa supravesicalis;
7 — ductus deferens;
8 — vesica urinaria.



Congenital (at the left) and acquired (on the right) oblique inquinal hernia:

1 — peritoneum; 2 — fascia transversalis; 3 — small intestine; 4 — hernial sac; 5 — testis; 6 — tunica vaginalis testis; 7 — tunica dartos; 8 — skin; 9 — hernial sac— tunica vaginalis testis; 10 — fascia spermatica interna.

A sliding hernia



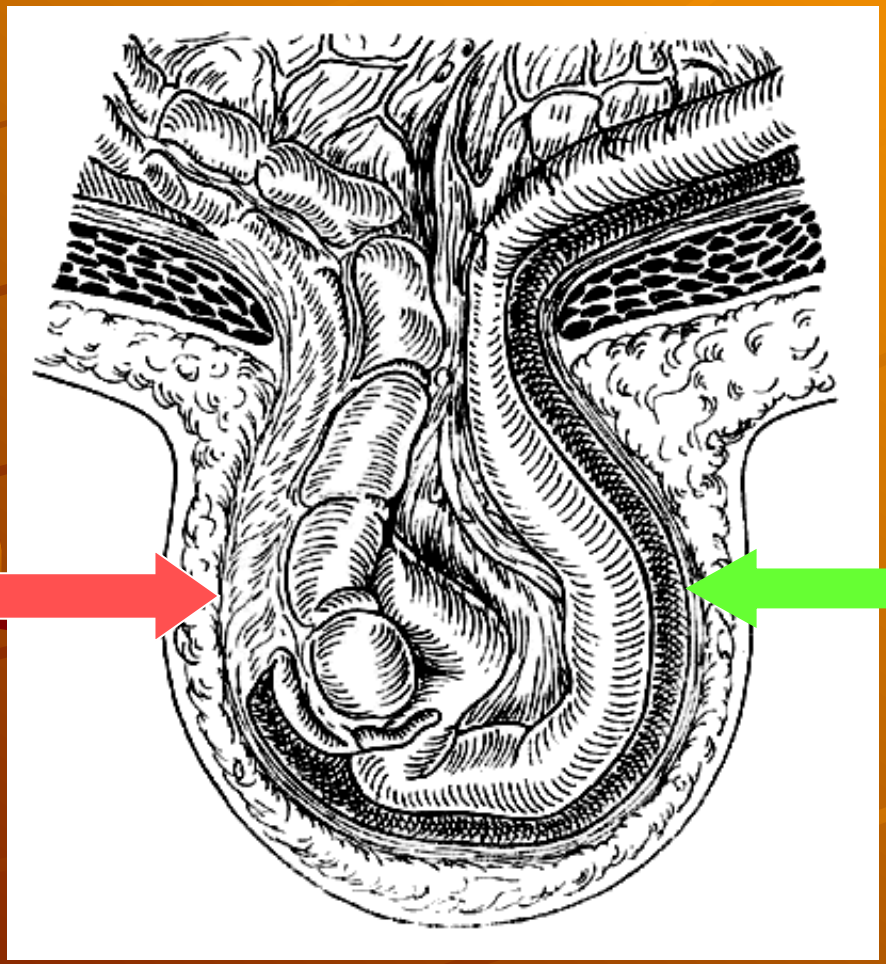
1 — peritoneum;

2 — fascia transversalis;

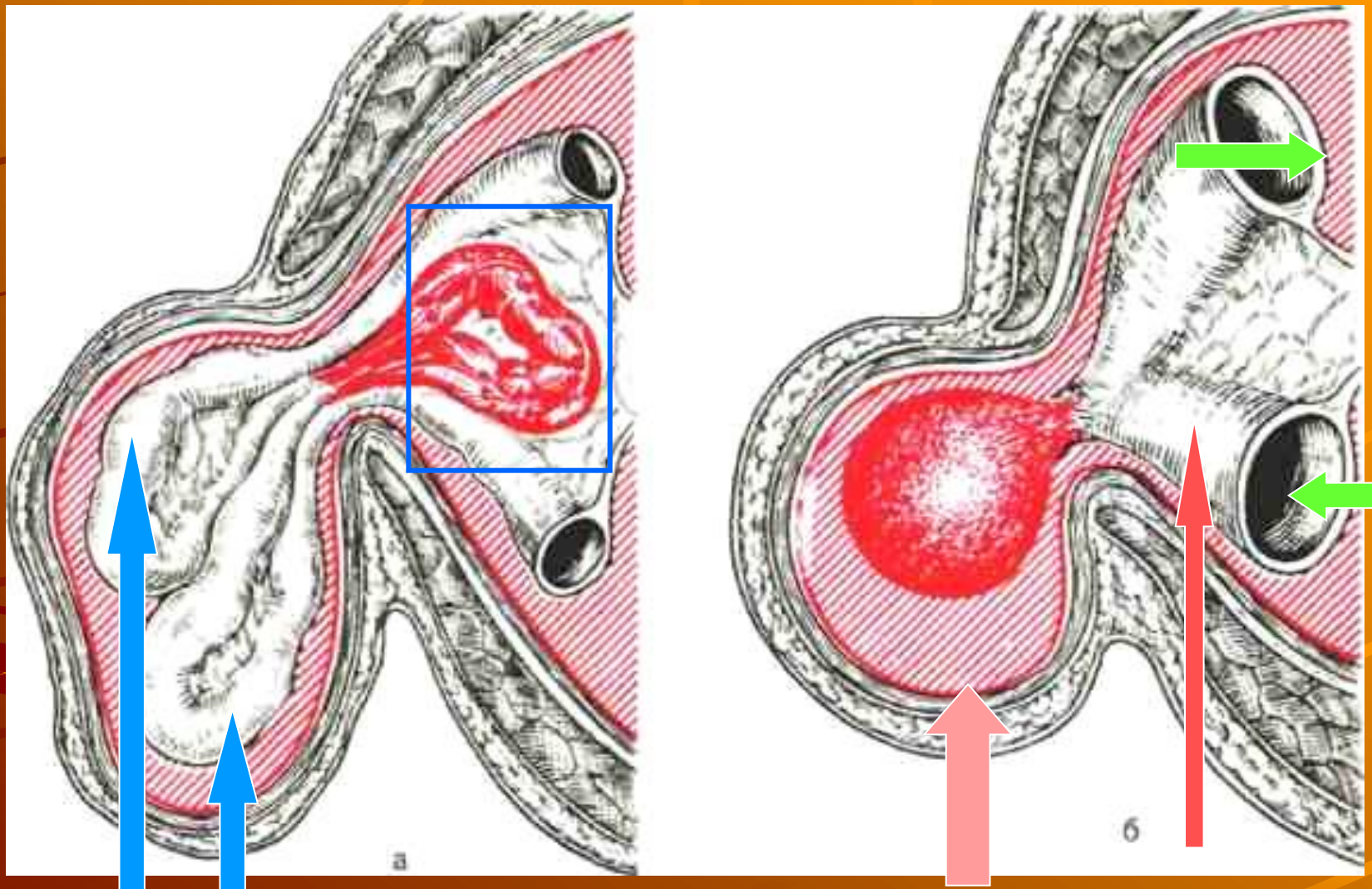
3 — hernial sac;

4 — the wall of a intestinum (caecum).

A sliding hernia

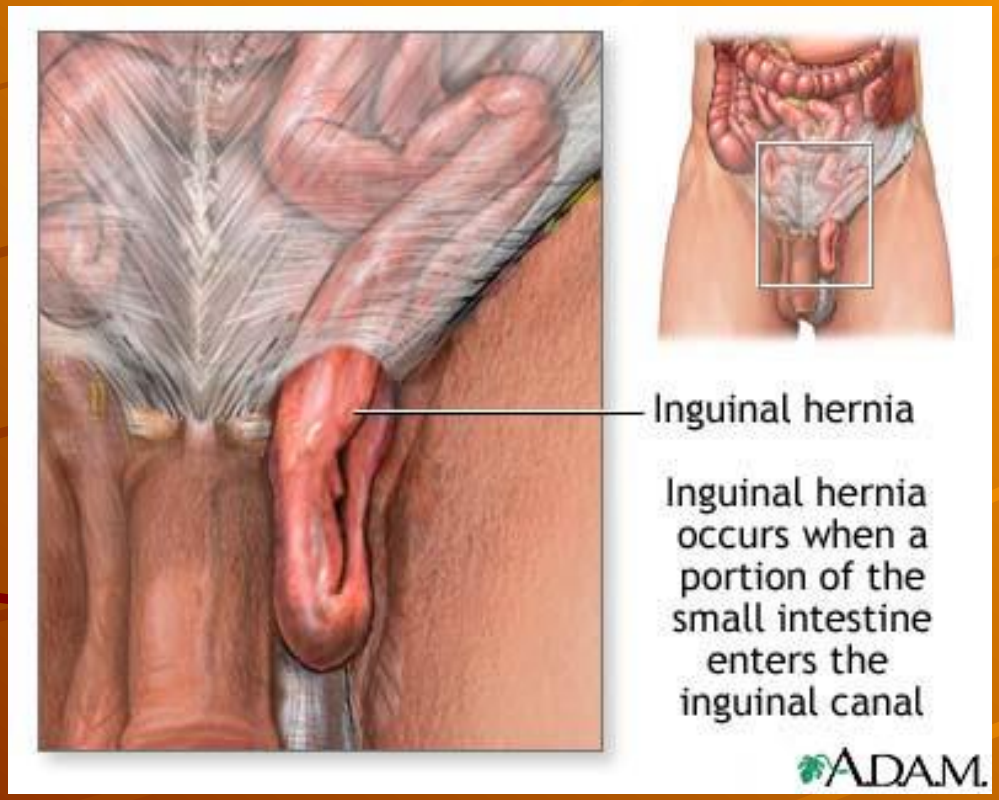


Incarceration kinds

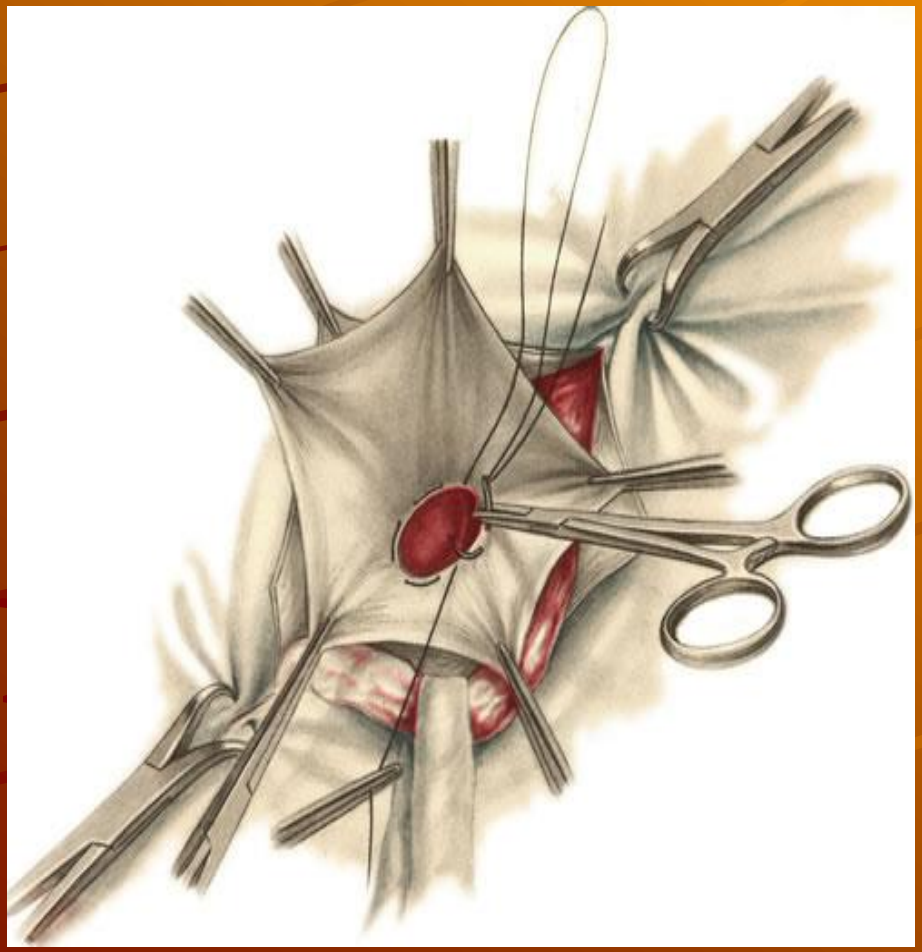


a – retrograde; **b – parietal (by Richter)**

Inguinal oblique hernia (schema)

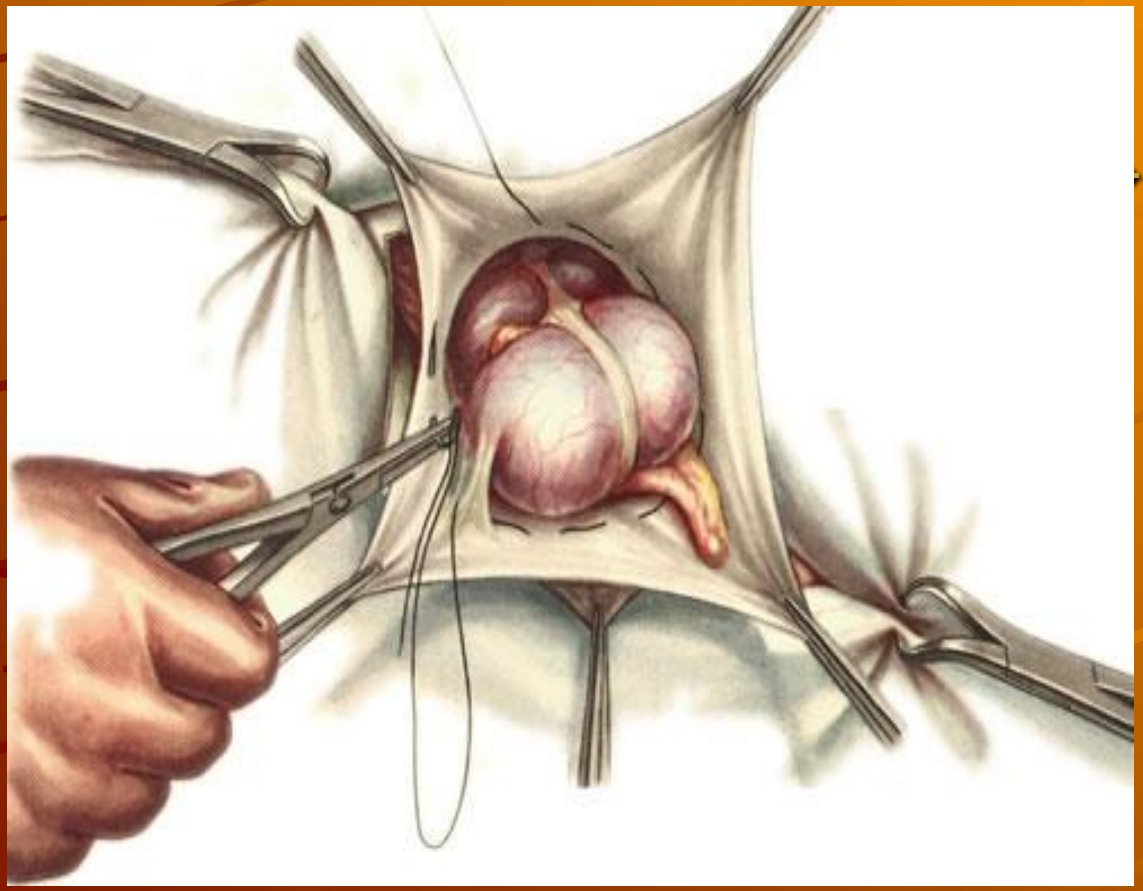


Inguinal direct hernia (I)



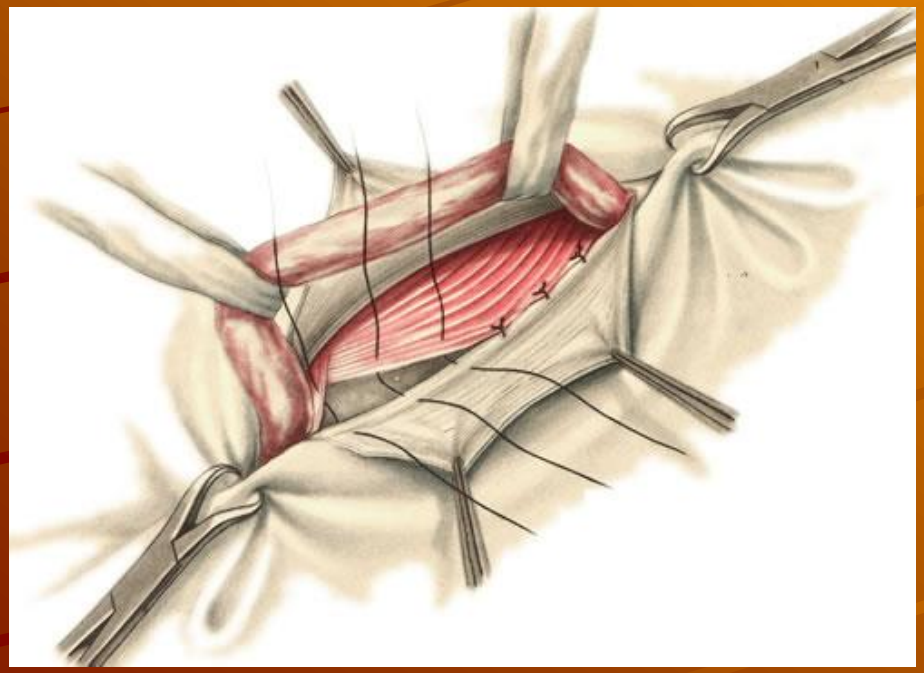
- Bassini hernia repair method: a circular steach in area of the neck

Inguinal direct hernia (sliding case)



- Features of formation of a circular steach in neck area of hernial sac.

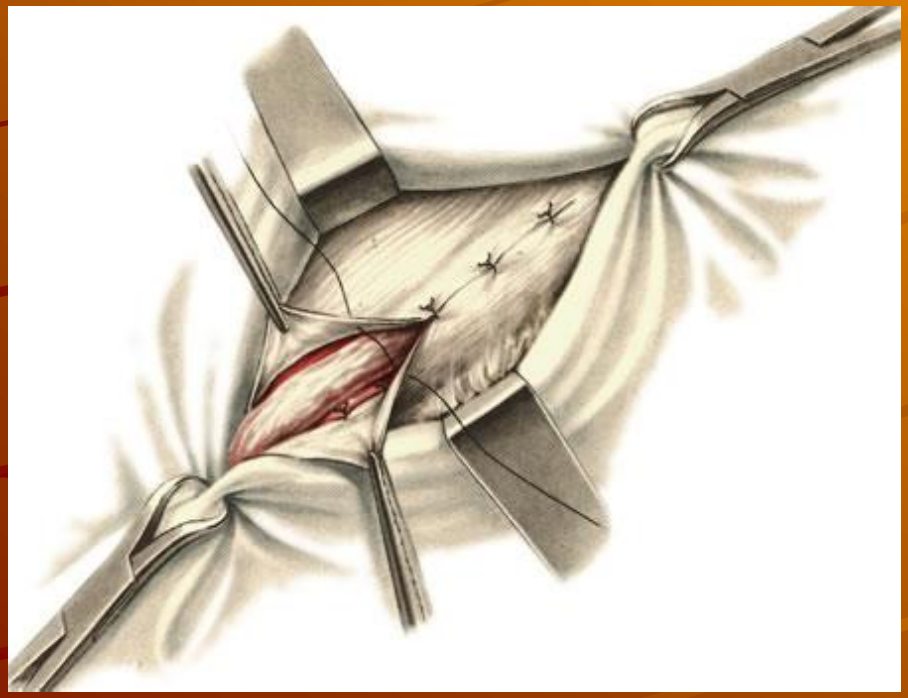
Inguinal direct hernia (II)



- Bassini hernia repair method:

  Sewing of an internal oblique and trans-versal muscle to inguinal lig. under spermatic duct

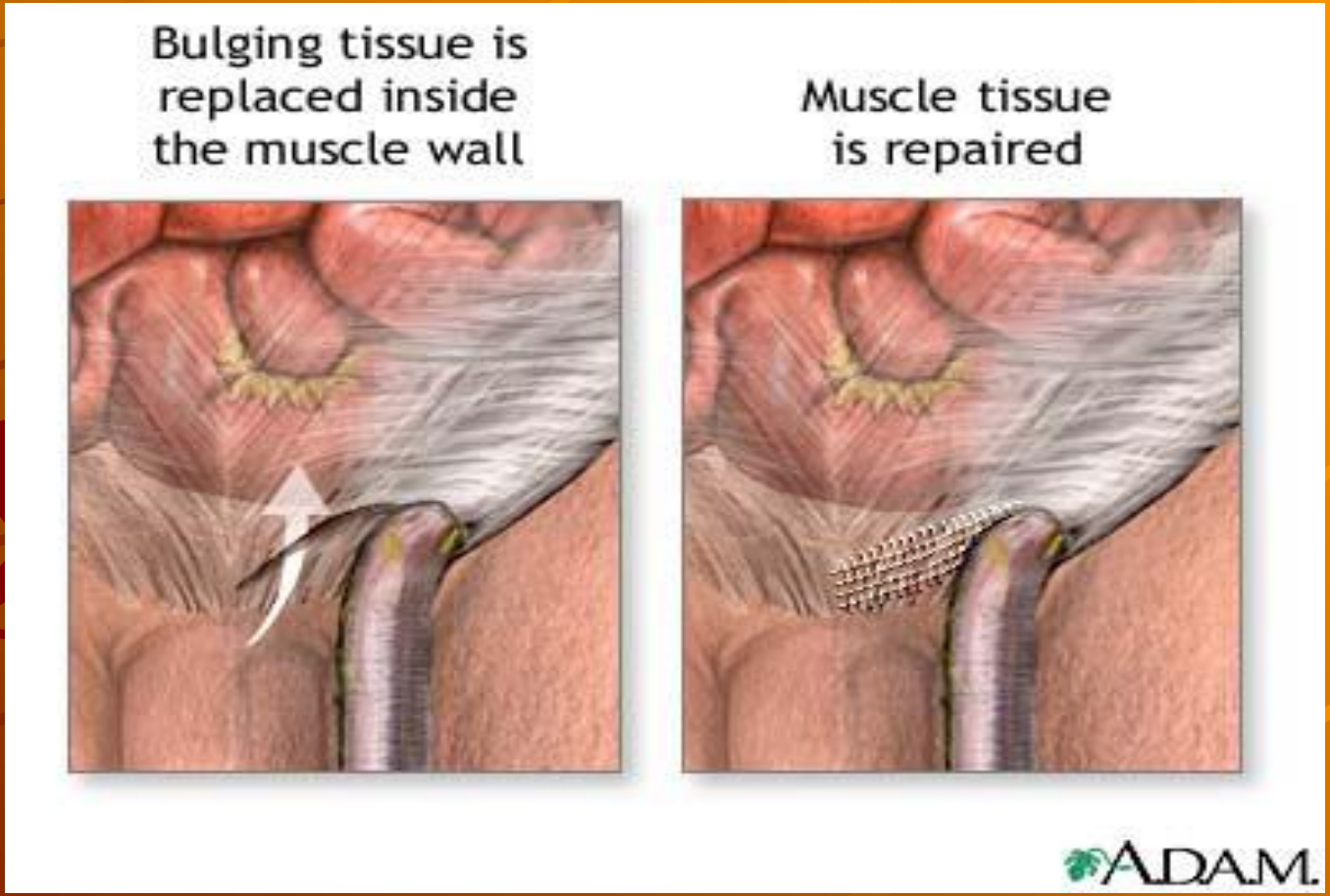
Inguinal direct hernia (III)



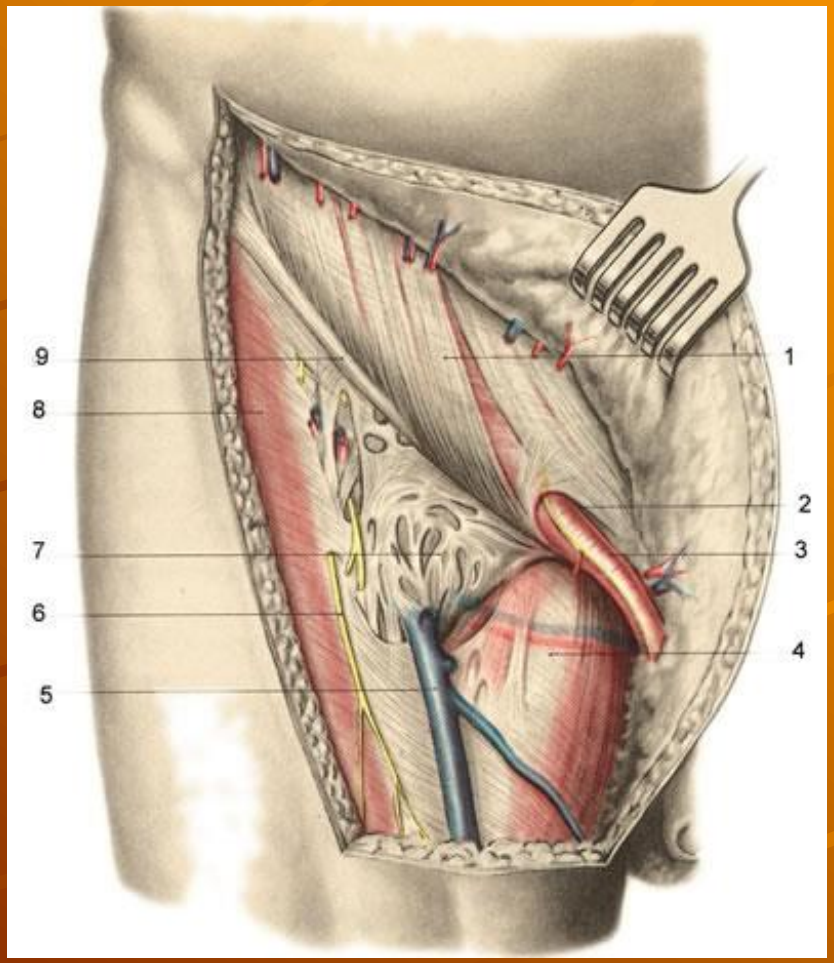
- Bassini hernia repair method:

  Seaming aponeurosis external oblique abdom. muscle above spermatic duct

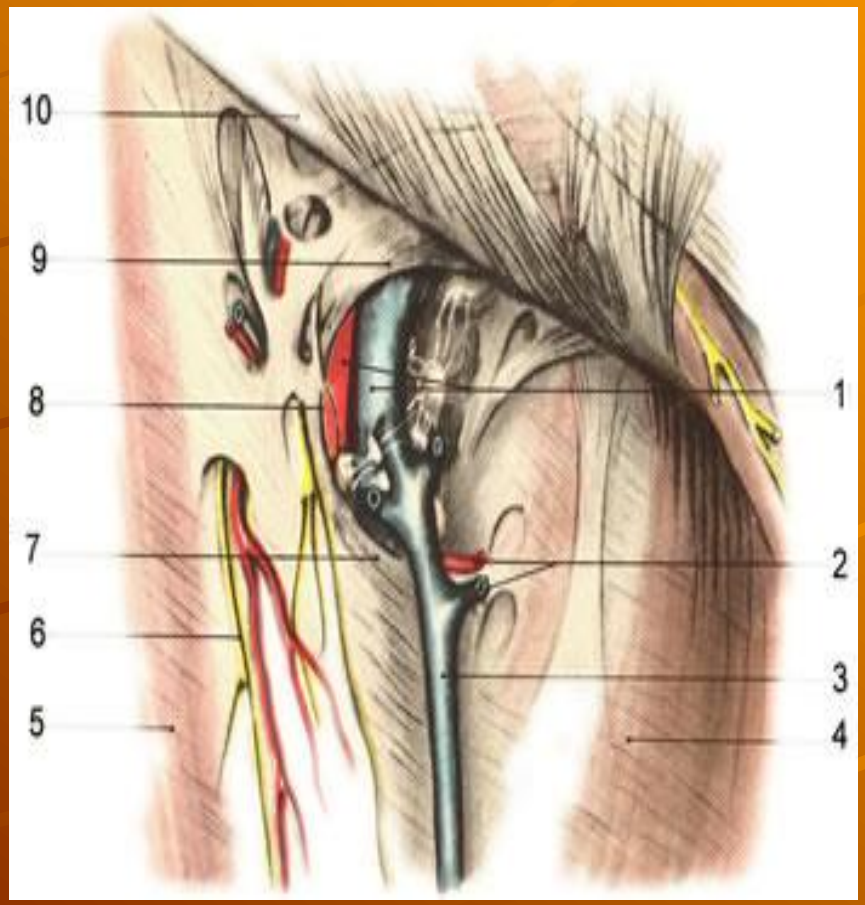
Allohernioplastic by Lichtenstein



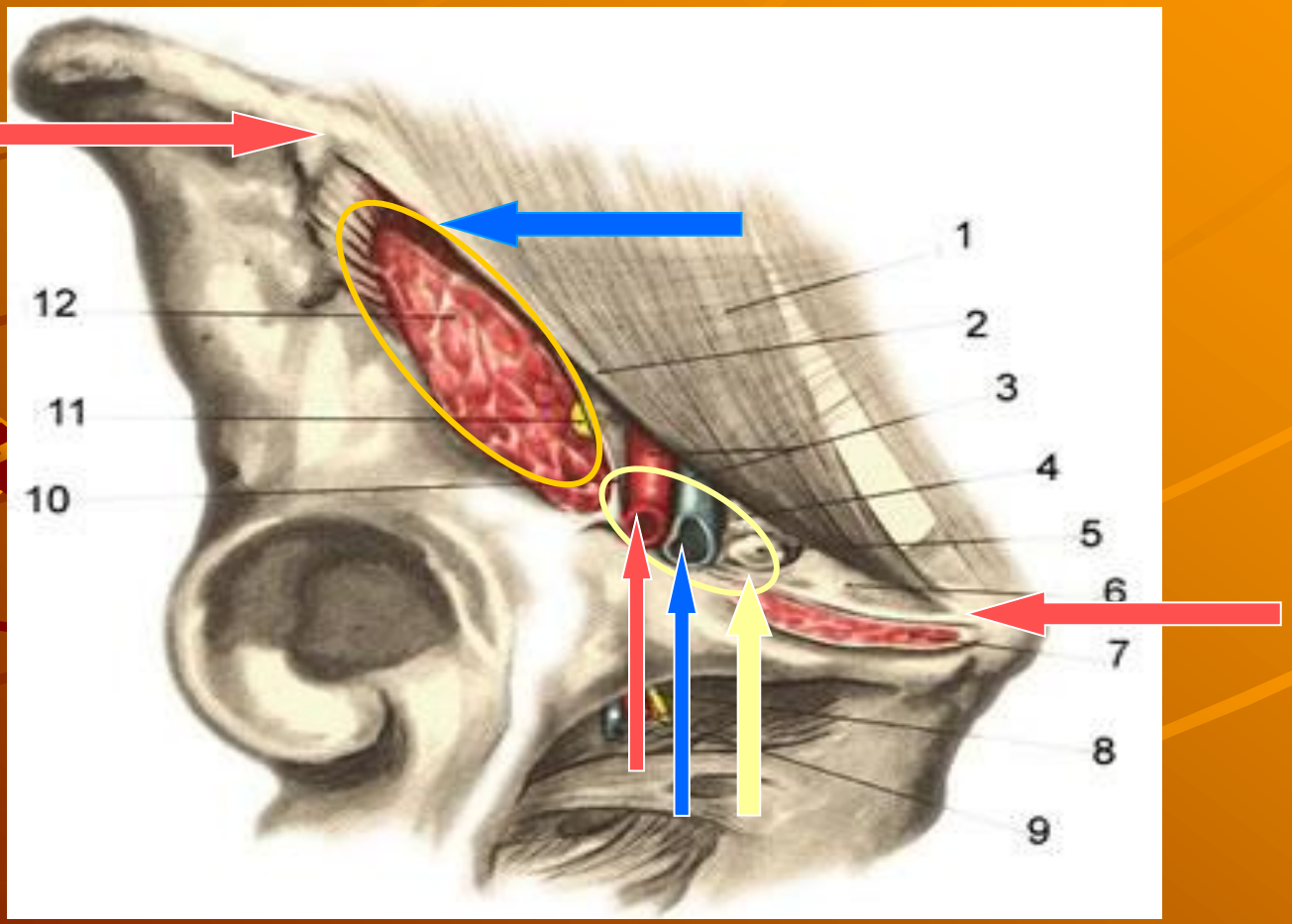
Topography of femoral triangle



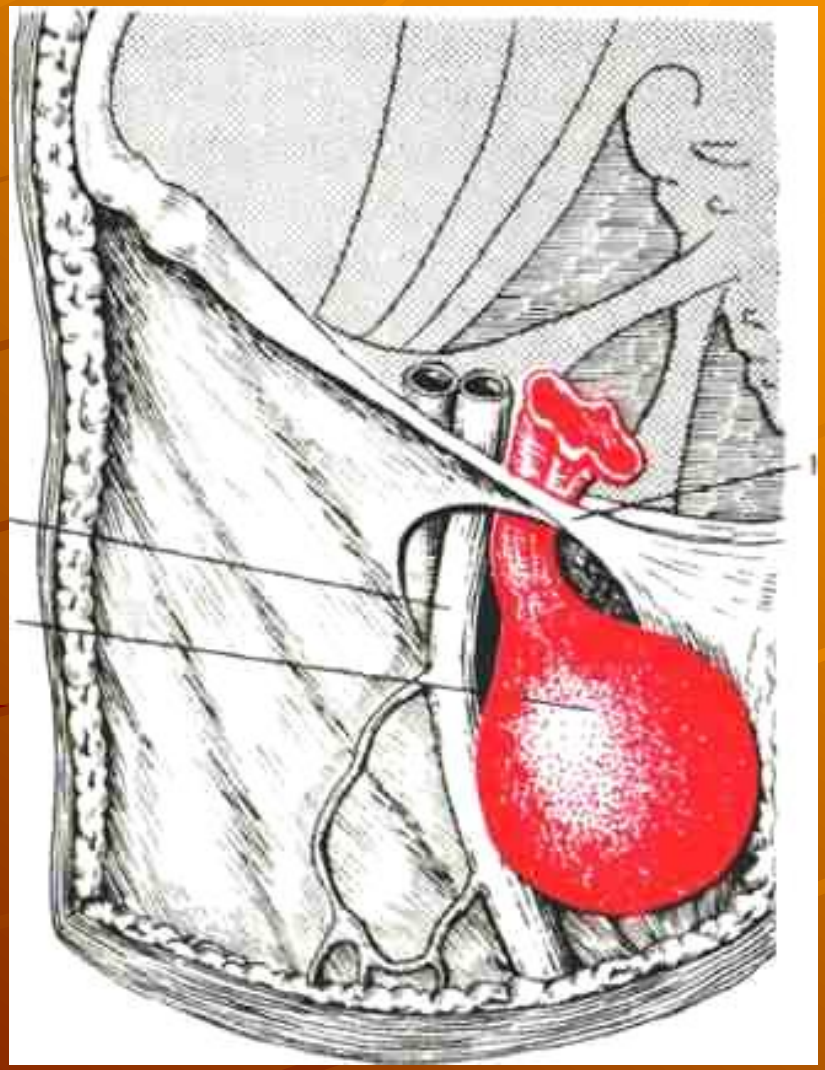
Topography of femoral triangle



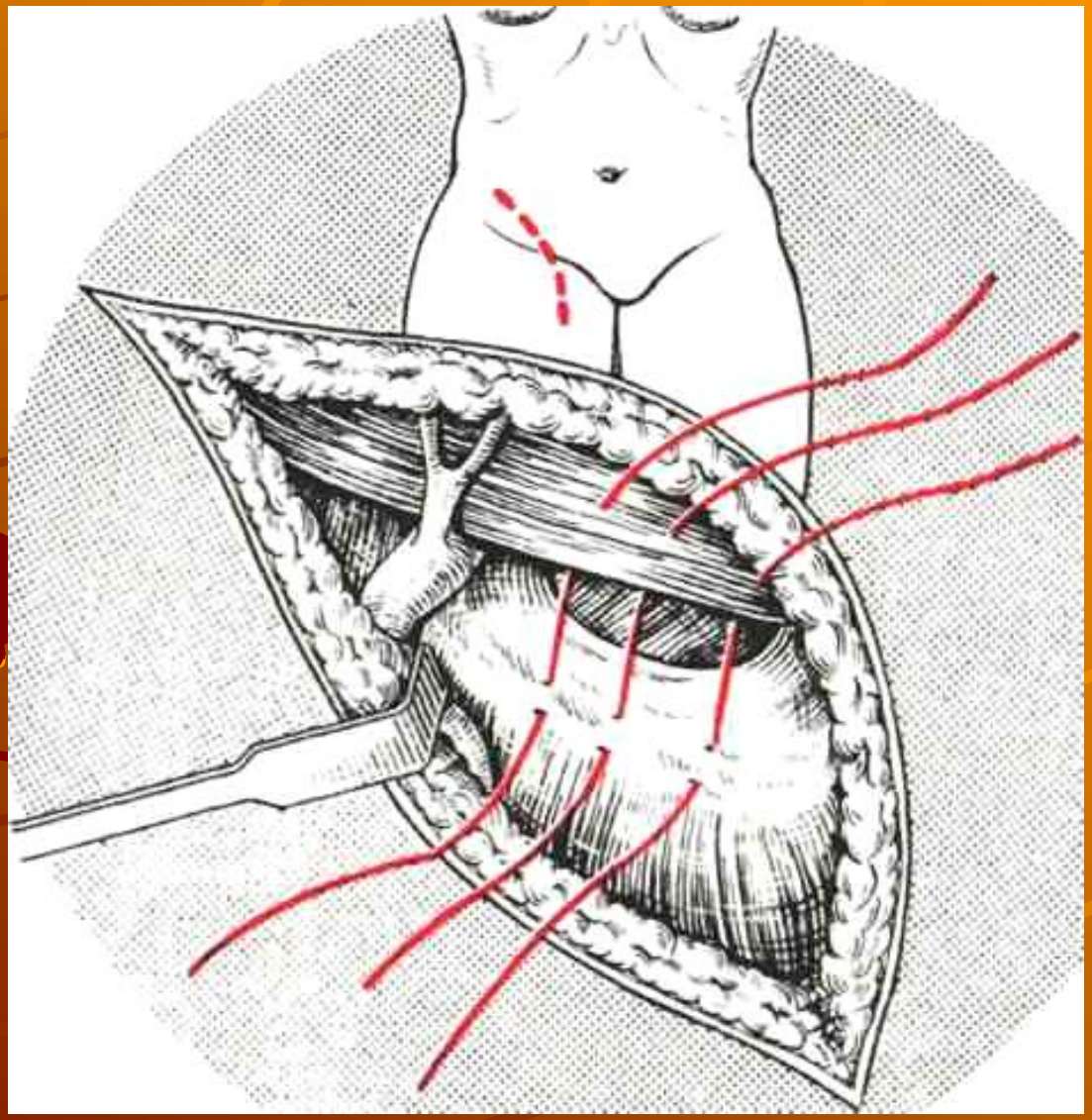
Topography of femoral triangle



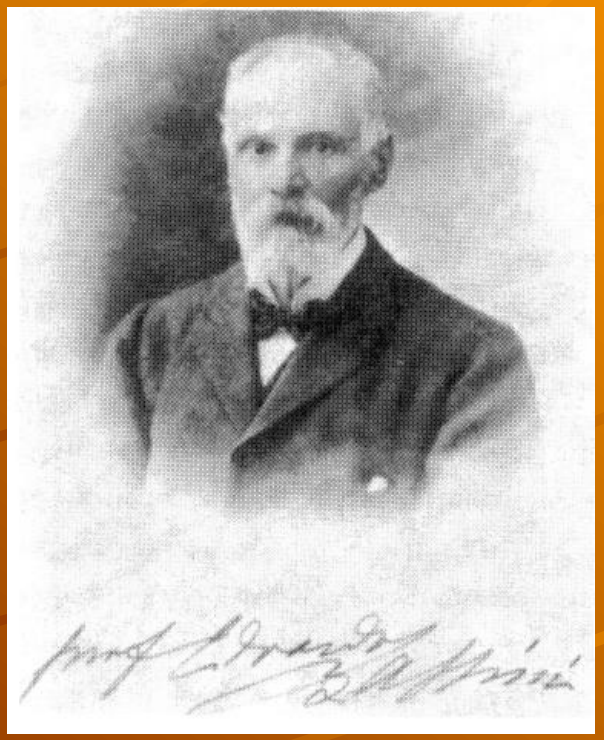
View of the typical femoral hernia
(the circuit)



Repair method by Bassini

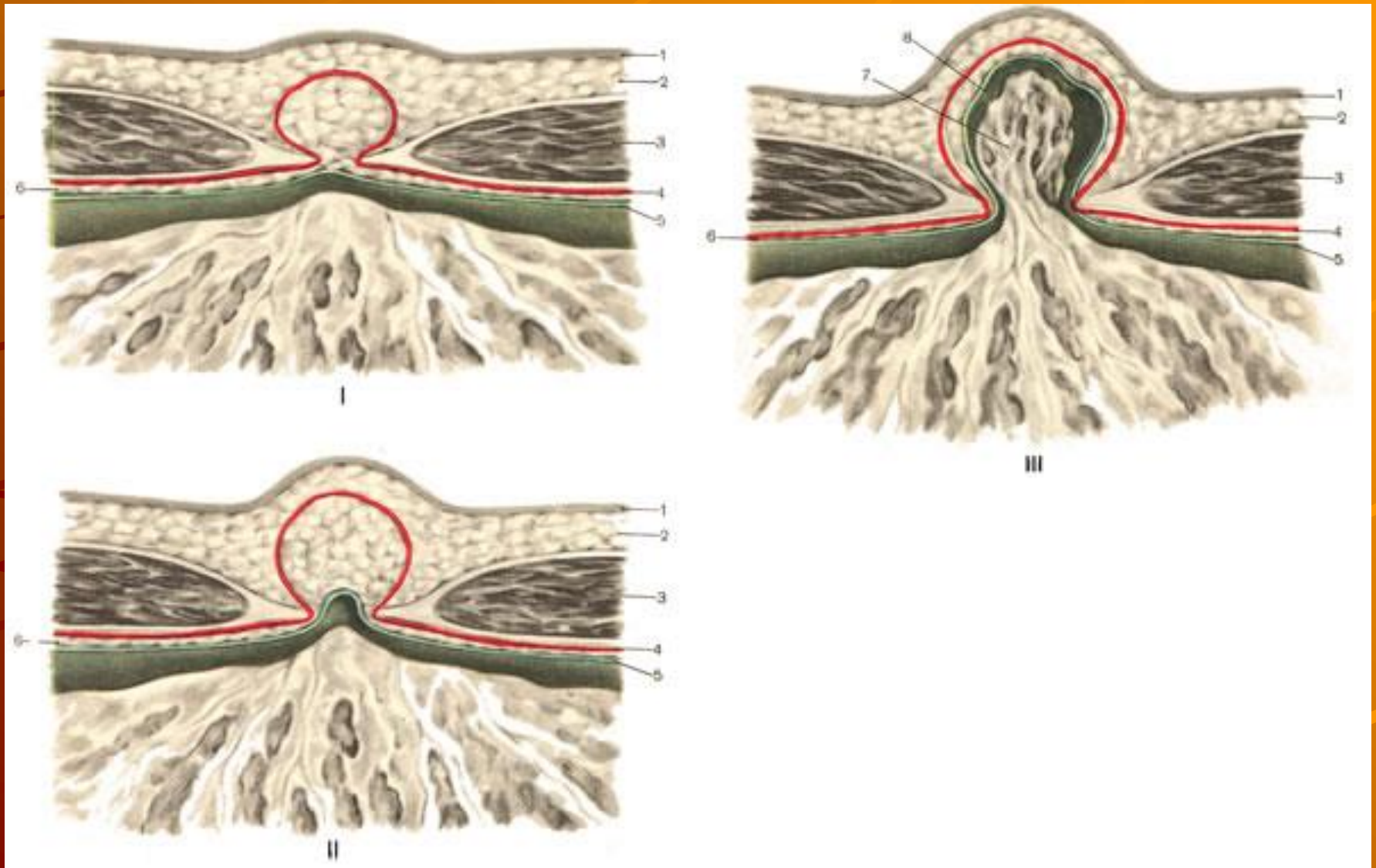


United concept of the treatment inguinal and femoral hernias

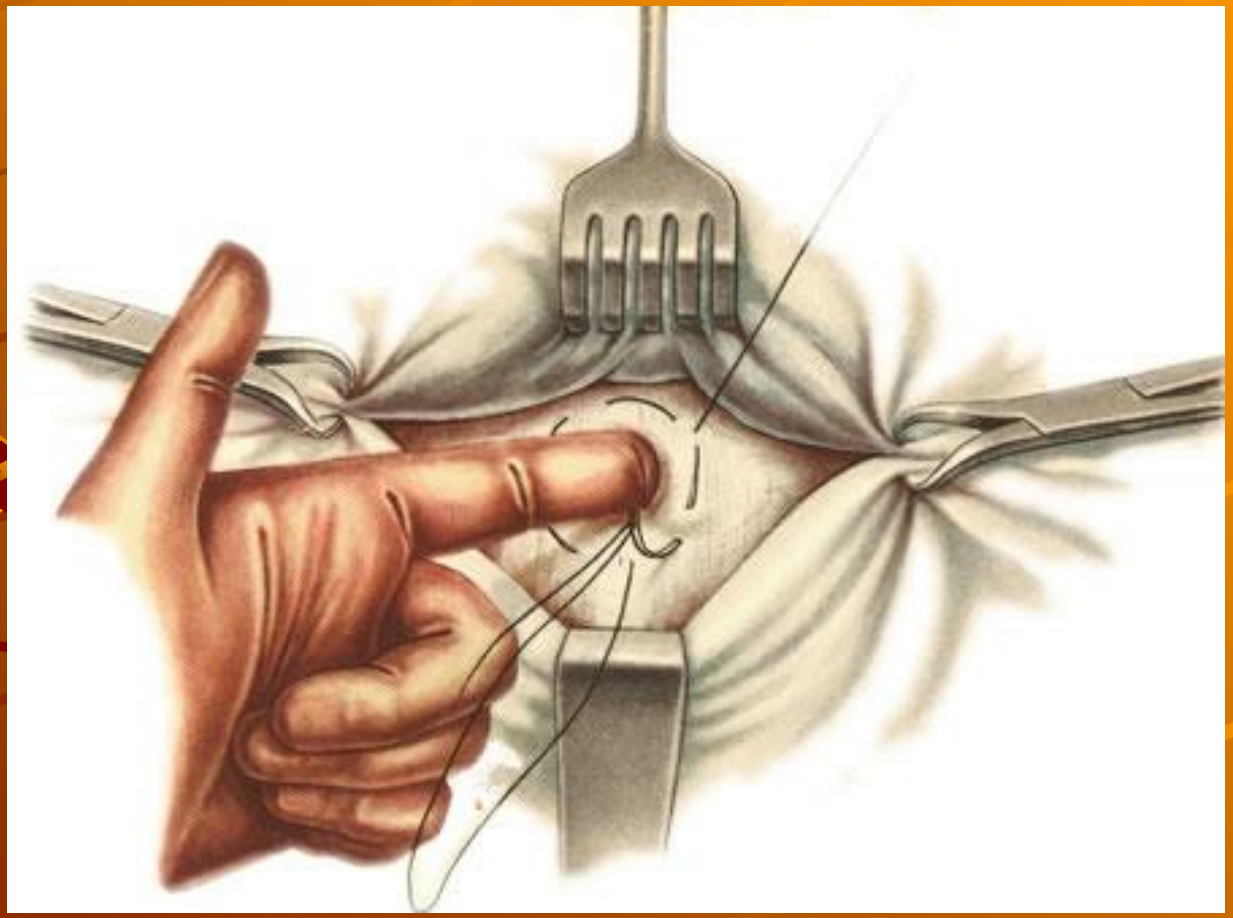


Eduardo Bassini
(1844-1924)

Development of midline hernia's



Umbilical hernia: Repair method by Lexer



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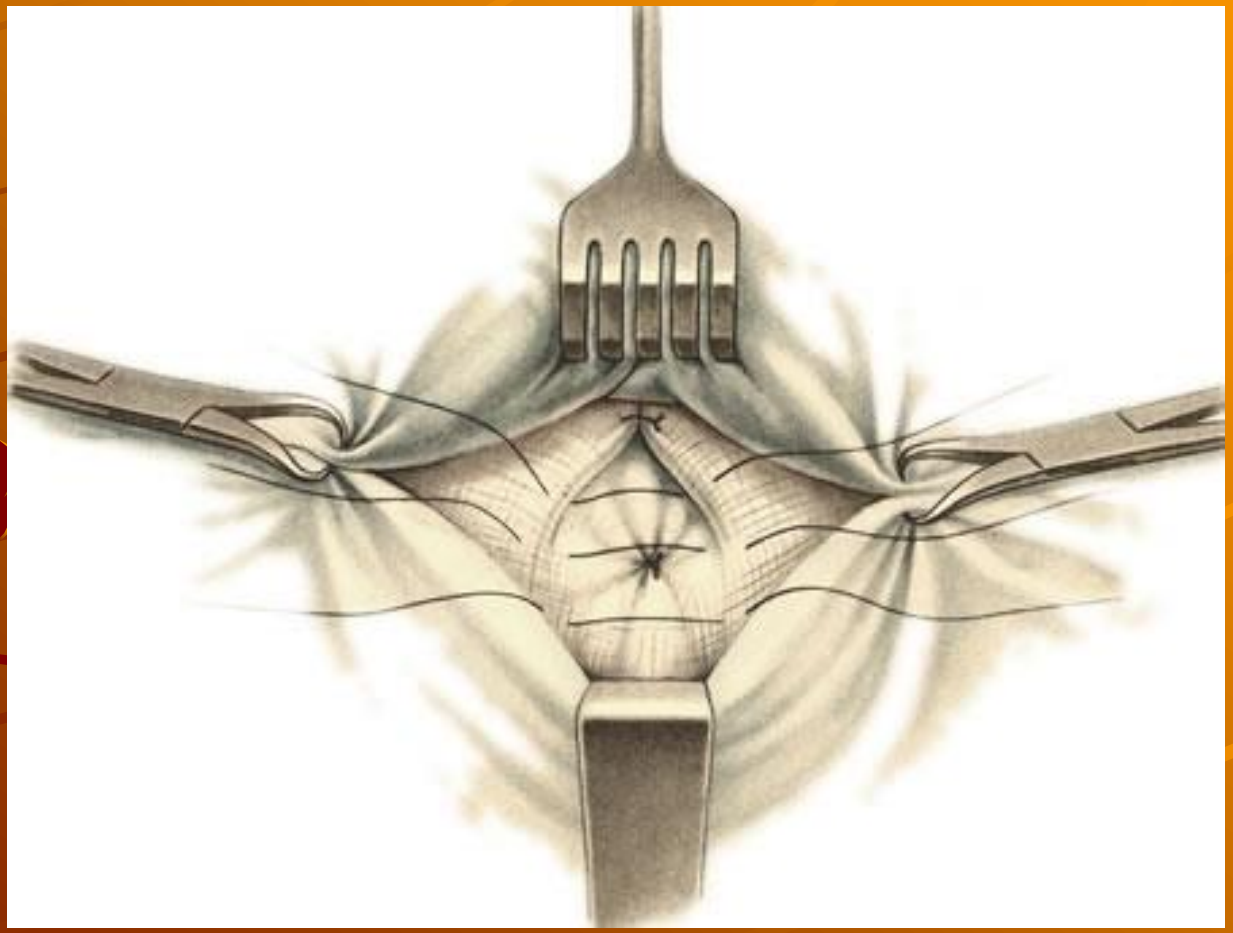
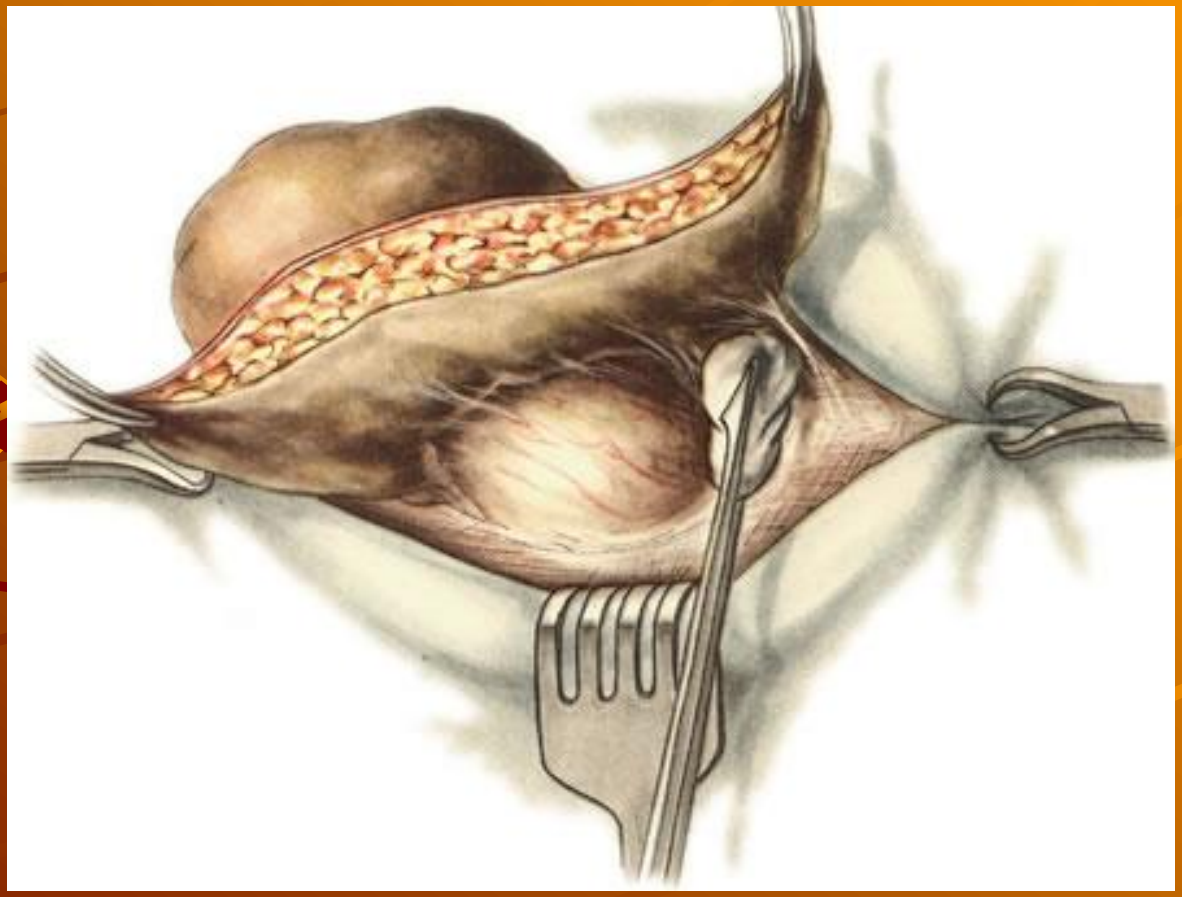
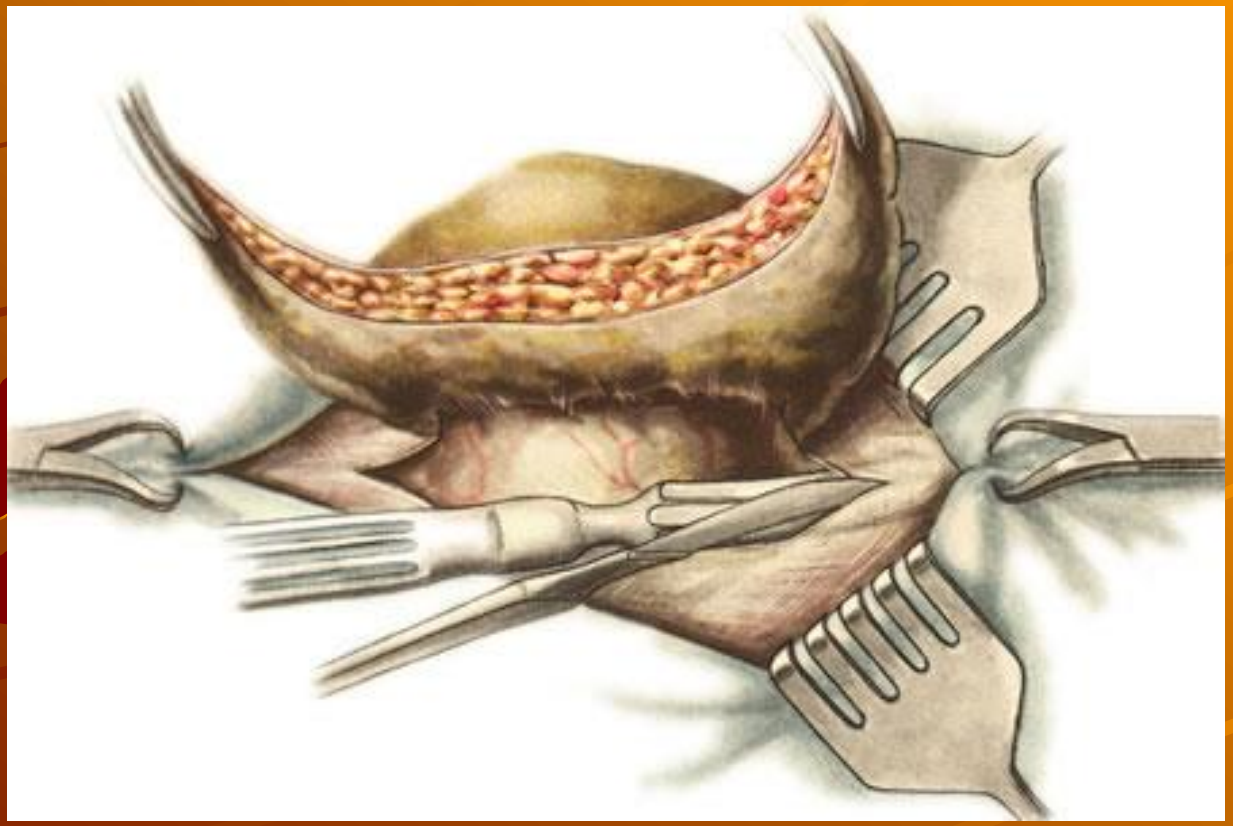


Umbilical hernia: Repair method by Meyo



Repair method by Meyo



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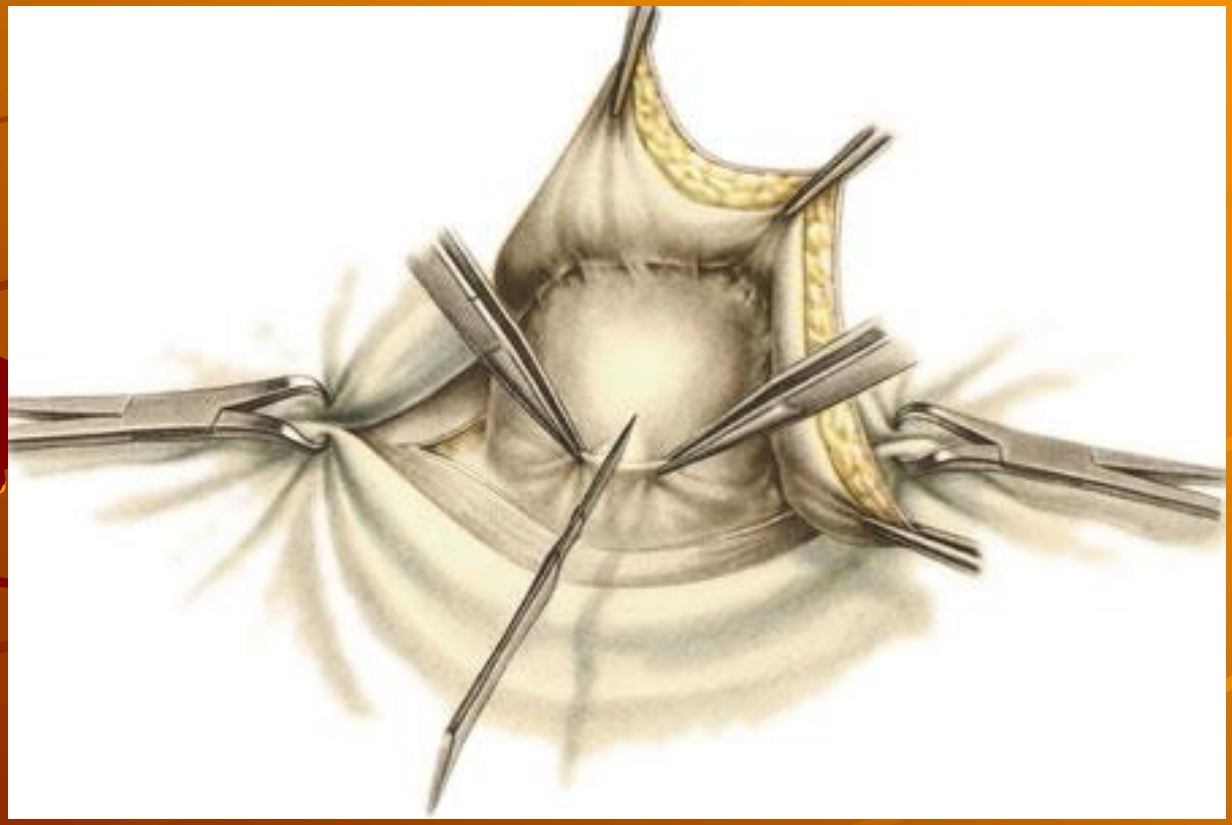
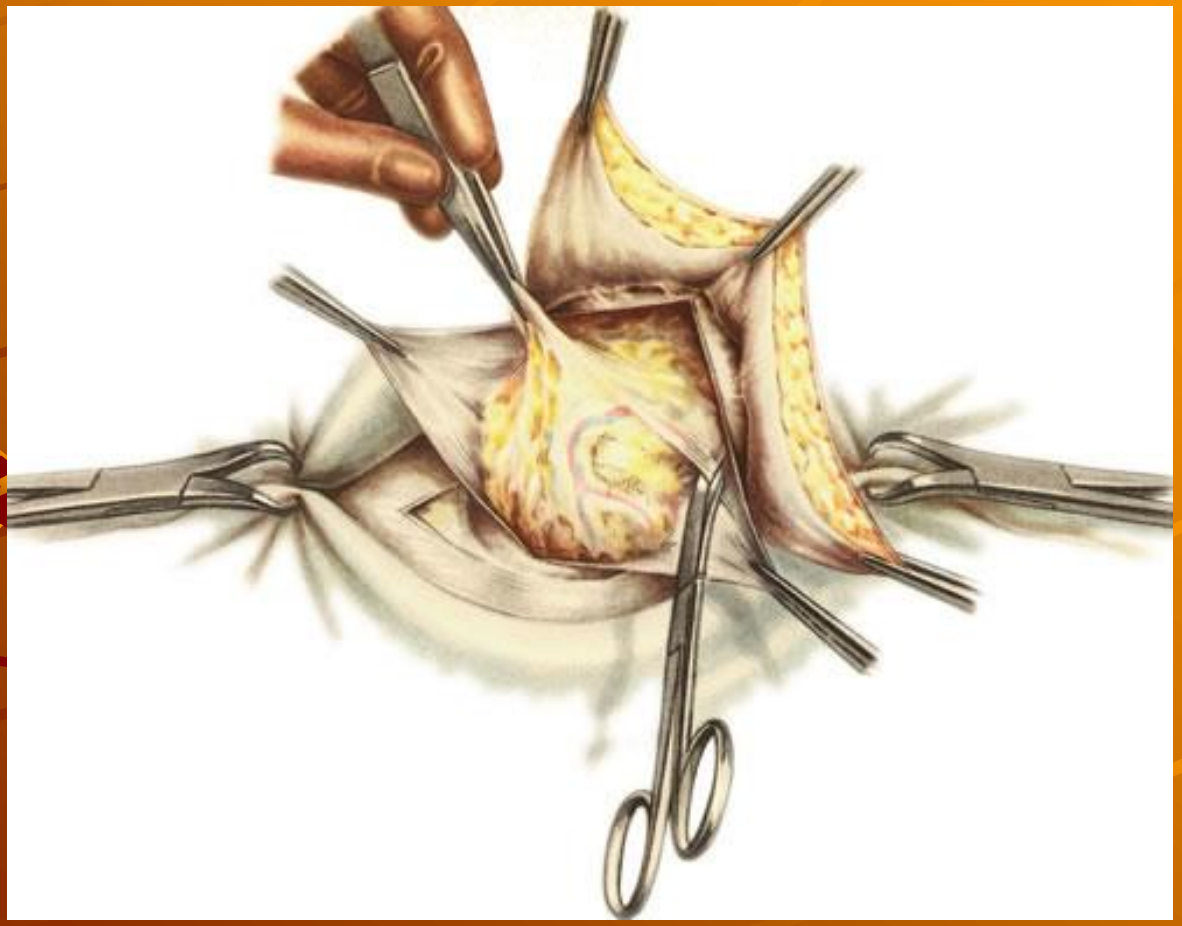


Repair method by Meyo



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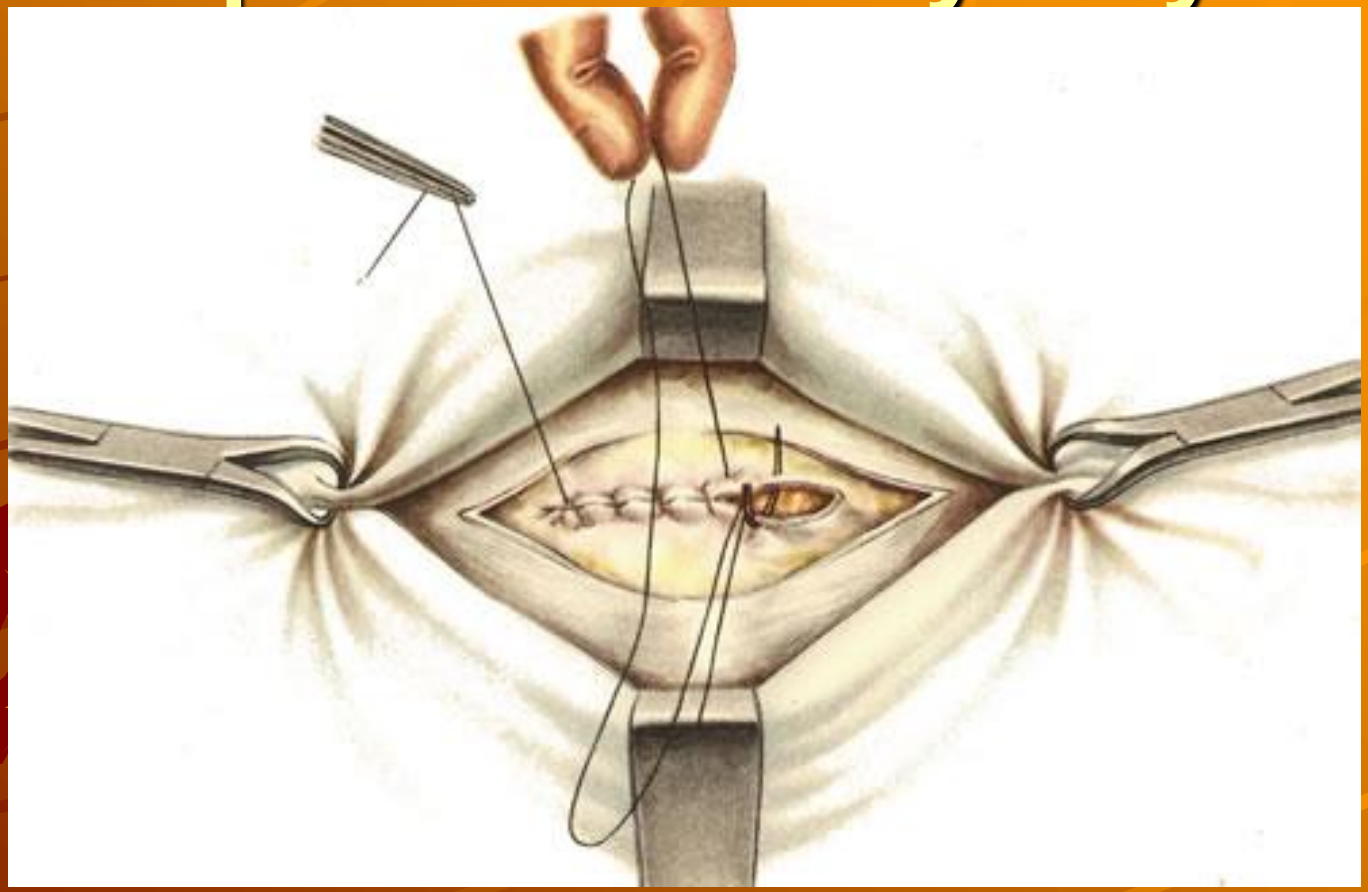

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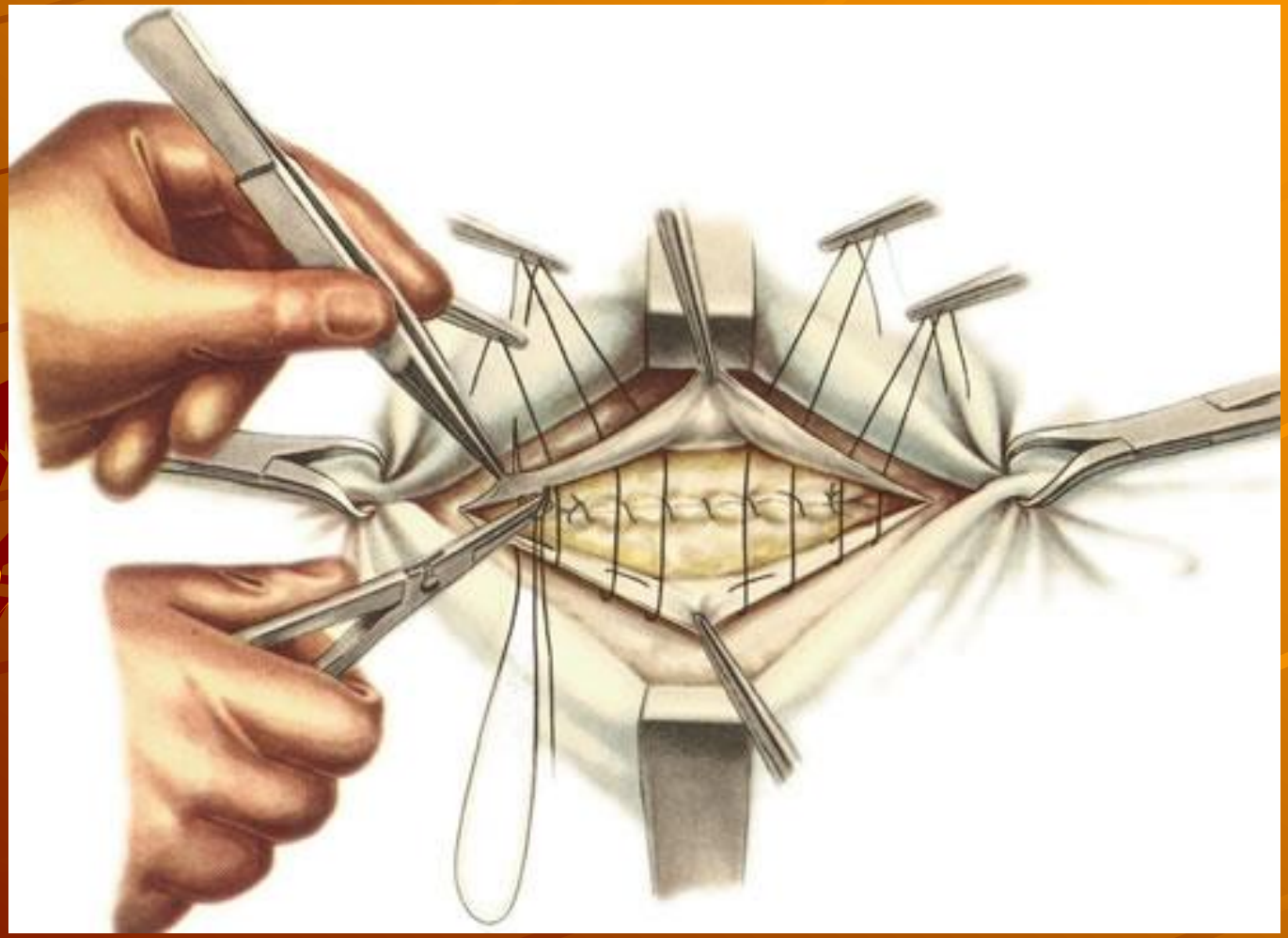
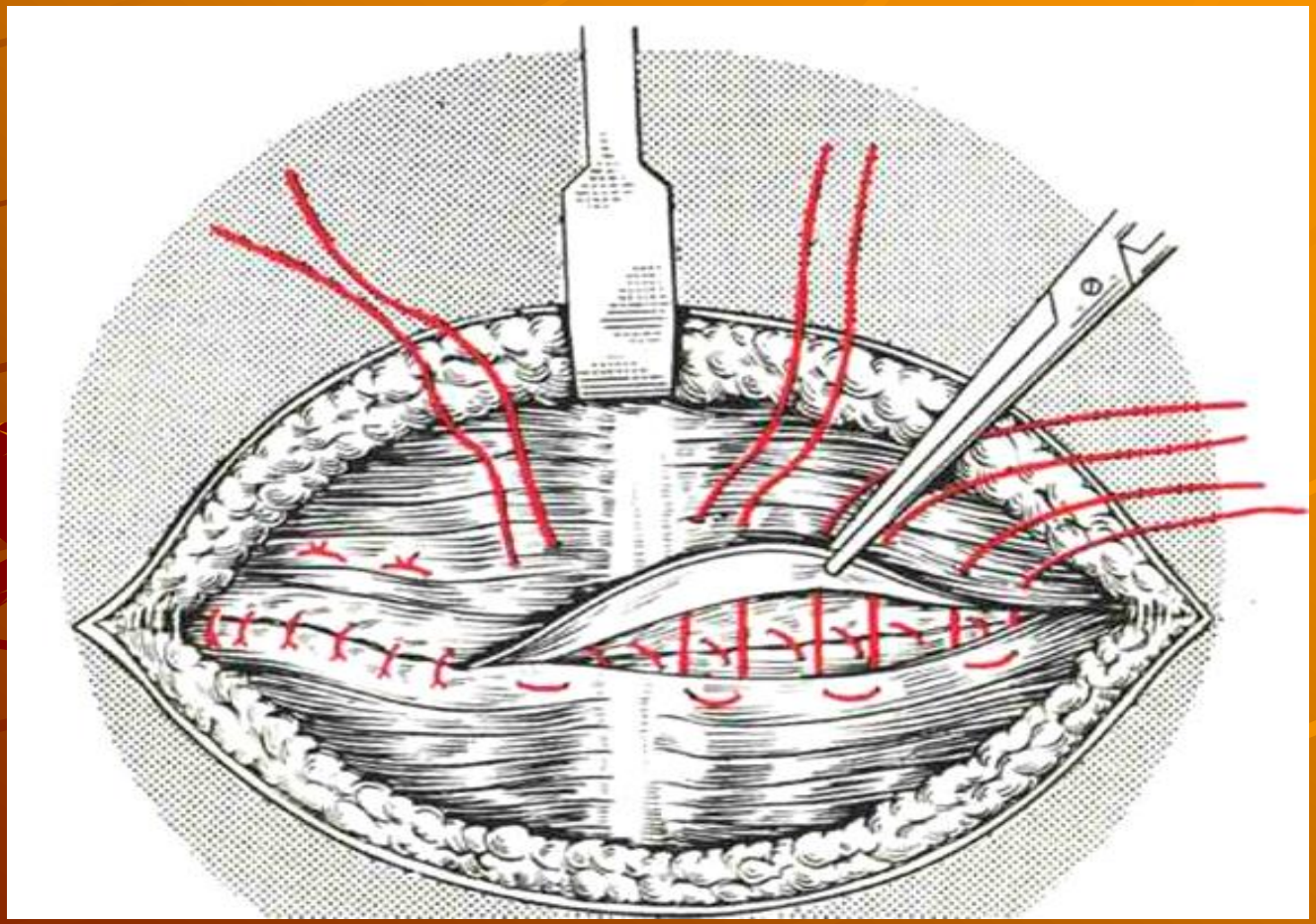


Repair method by Meyo



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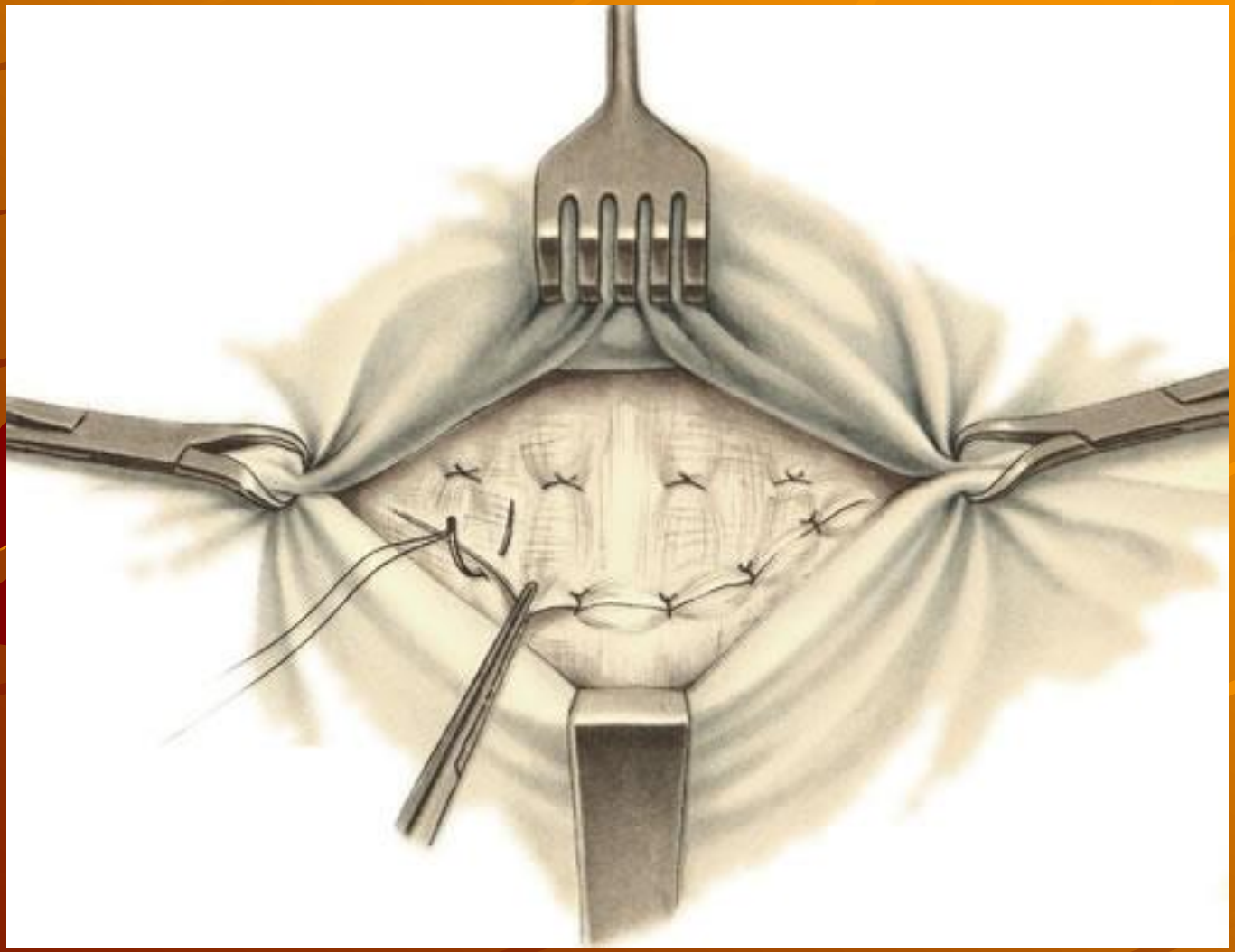
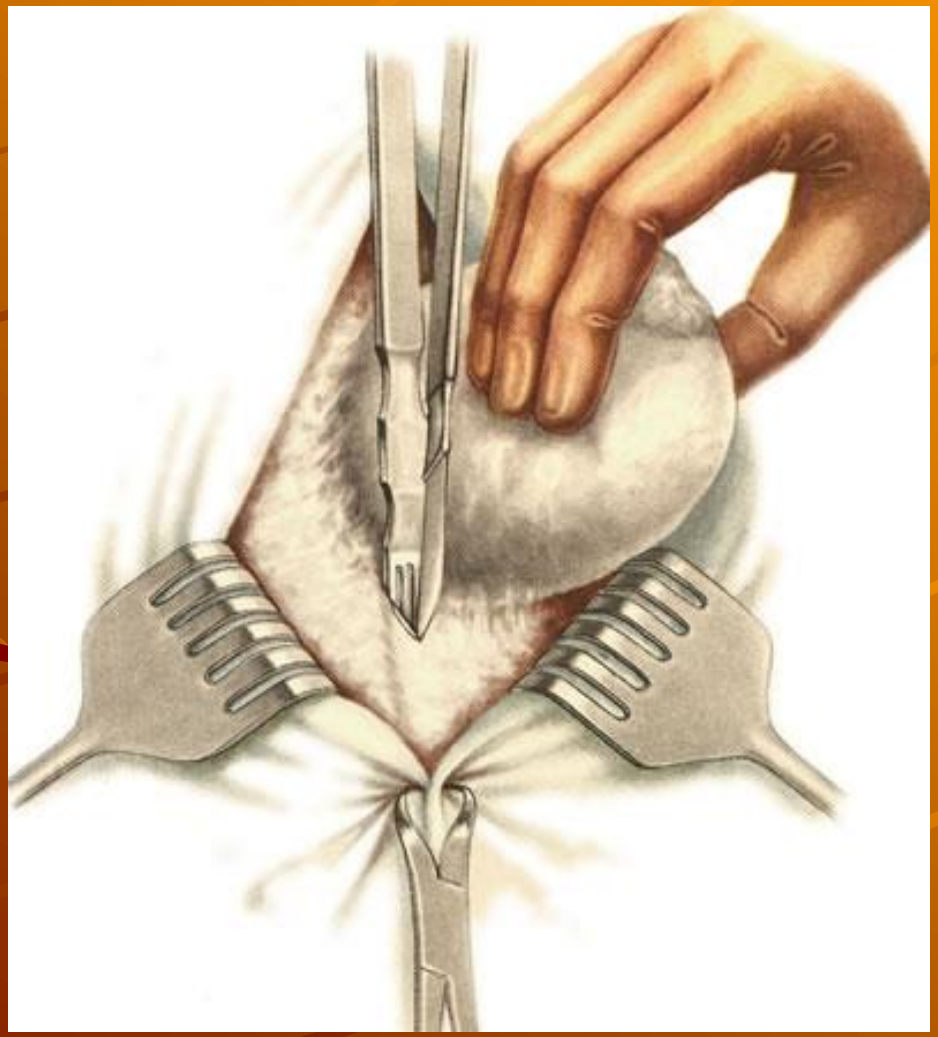
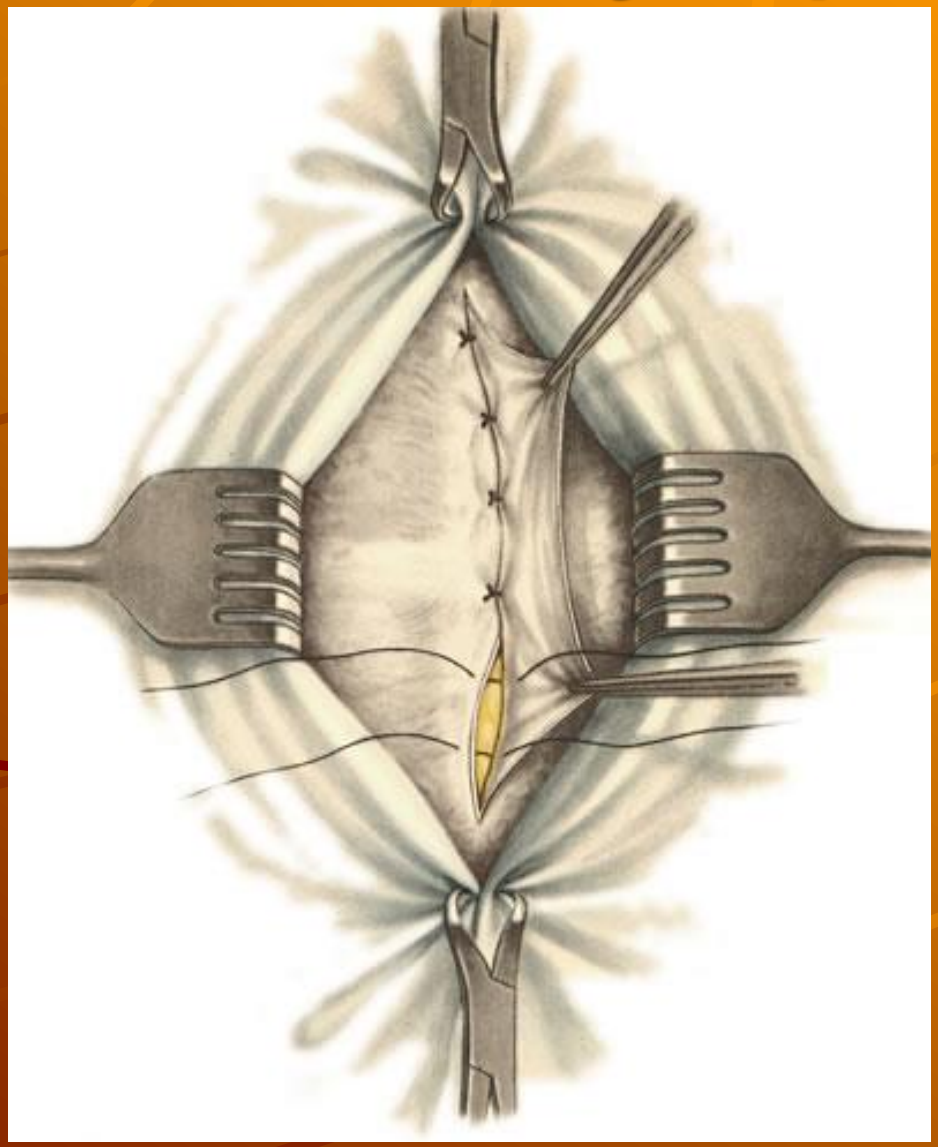


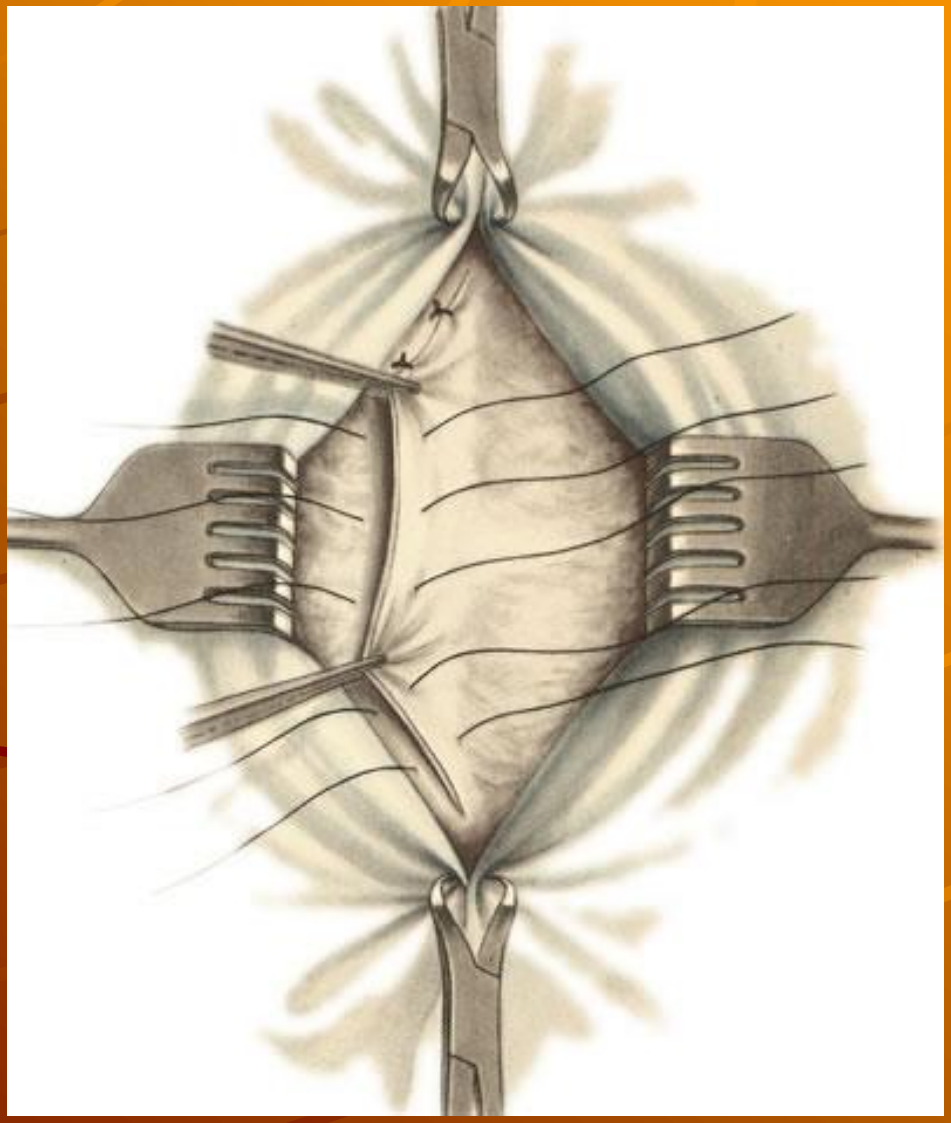
Umbilical hernia: Repair method by Sapezhko



Umbilical hernia: Repair method by Sapezhko



Umbilical hernia: Repair method by Sapezhko



Hernia Surgical Complications

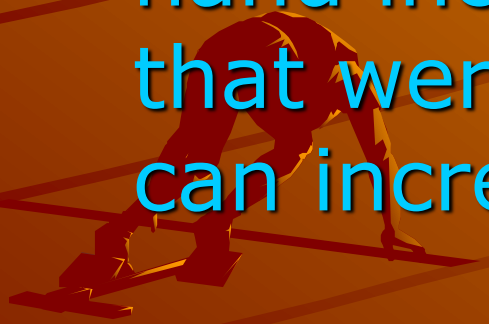
- As in any other surgical procedure complications in hernia repair can happen. It should be emphasized right from the beginning that this procedure is extremely safe and the amount of complications is minimal.

Pain

- Any surgical procedure will result in some pain to the patient. The level or the degree of pain ranges from mild to severe. Usually after hernia repair will control their pain with oral medication. The pain may last from 2 to 6 days and then goes away. Some patients will resume will resume their normal working habits within a day or two and for others it will take longer. At times patients might confuse chronic pain after hernia repair with recurrent hernia. Pain after the repair can last for a while but it does not mean a recurrence. Those patients who suffer from chronic and long lasting pain after the repair should look into the possibility of nerve entrapment. This possibility could be treated with a pain management specialist. In cases that none of the conservative measures help then a surgical intervention could be offered. In this situation expiration of the previous repair can be carried out and any identified sensory nerve can be cut and prevents anymore chronic pain. As a result of this nerve cutting a patient should feel some numbness in that area but not any disabling pain that the patient might have experienced before.

Infection

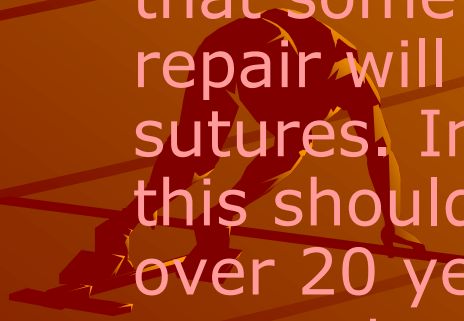
- This happens in extremely rare cases due to the fact that this procedure is done mostly on an elective basis in a sterile environment. On the other hand incarcerated hernias or those that were neglected for a long time can increase the rate of infection.



Bleeding

- This also can happen on very rare occasions. Some patients will see some bruising signs on their skin but this has no clinical importance to the patient.

- **Nerve entrapment** - There is a slight possibility that some nerves in the vicinity of the hernia repair will be caught in the mesh or in the sutures. In the hands of an experienced surgeon this should be a very rare possibility. So far in over 20 years of practice Dr. Reisfeld has not encountered this complication.



Hernia Surgical Complications

- **Swelling** - Immediately after the hernia repair patients may experience swelling around the area of the repair. In the male population the swelling can go down to the base of penis as well as the testicular sack. Again this is temporary and the swelling will go down.

- **Recurrence** - As in any other technical procedure there is a possibility of a hernia to come back. Statistically this can happen in about 1.5% of the cases. Recurrence can happen due to faulty repair, infection or some deficiency in the tissues that the patient has. Obviously obesity, poor nutrition, anemia and other associated illnesses can influence the outcome of the operation.

- **Testicular damage** - While performing a inguinal hernia repair in the male population on very rare occasions damage to the testicle can happen. This can be due to damage to the blood supply, swelling or simple technical error. Again this is a very rare possibility and usually it happens more when recurrent hernia repair is done. A patient should be aware of this but the likely hood is very rare.

The End