

**Musculi abdominis**

**Canalis inguinalis**

**Musculi diaphragmatis  
pelvis**

# Musculi abdominis – overview

- ventral group
  - m. rectus abdominis
  - m. pyramidalis
- lateral group
  - m. obliquus externus abdominis
  - m. obliquus internus abdominis
  - m. transversus abdominis
- posterior group
  - m. quadratus lumborum

# Mm. abdominis

## posterior group

- **m. quadratus lumborum**

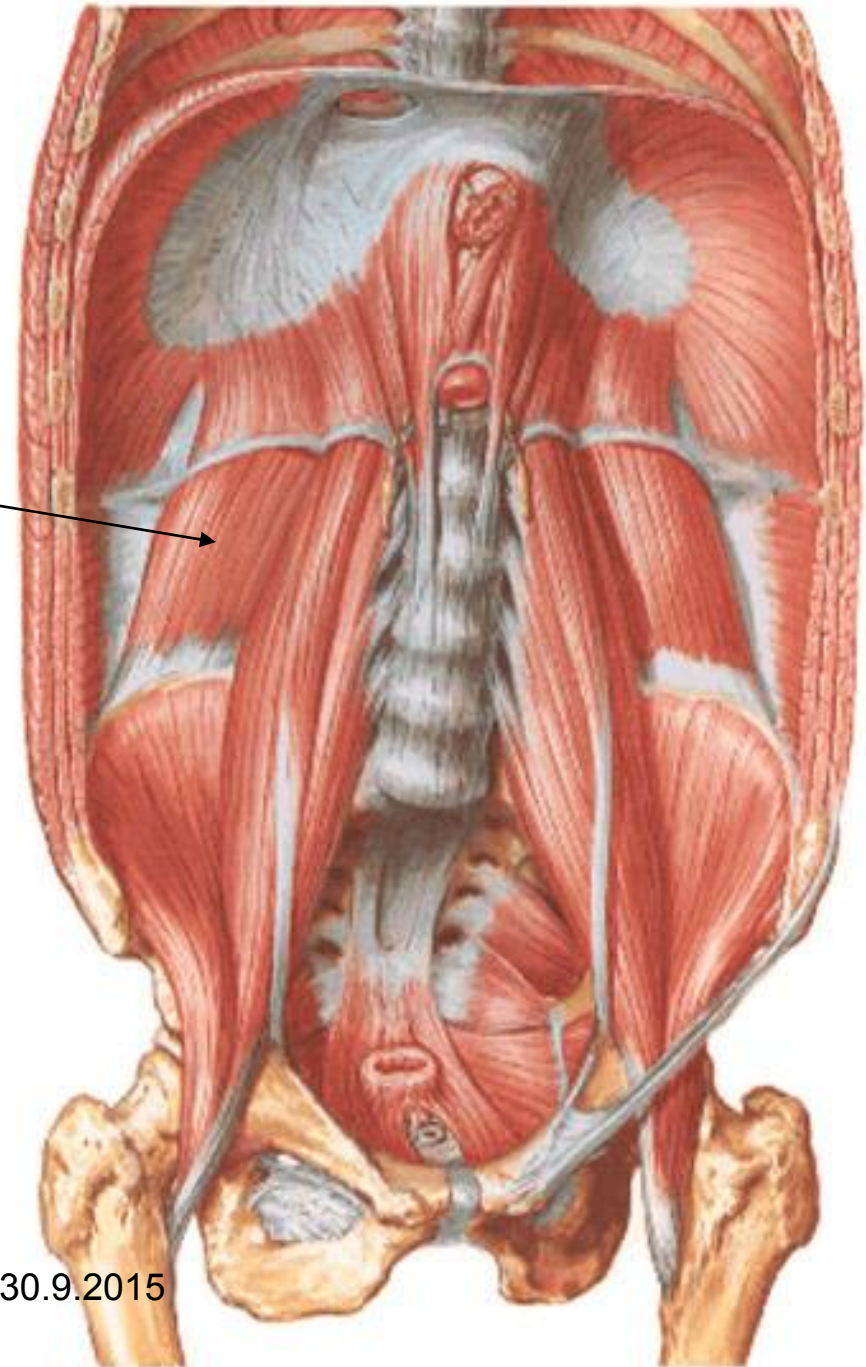
innervation:

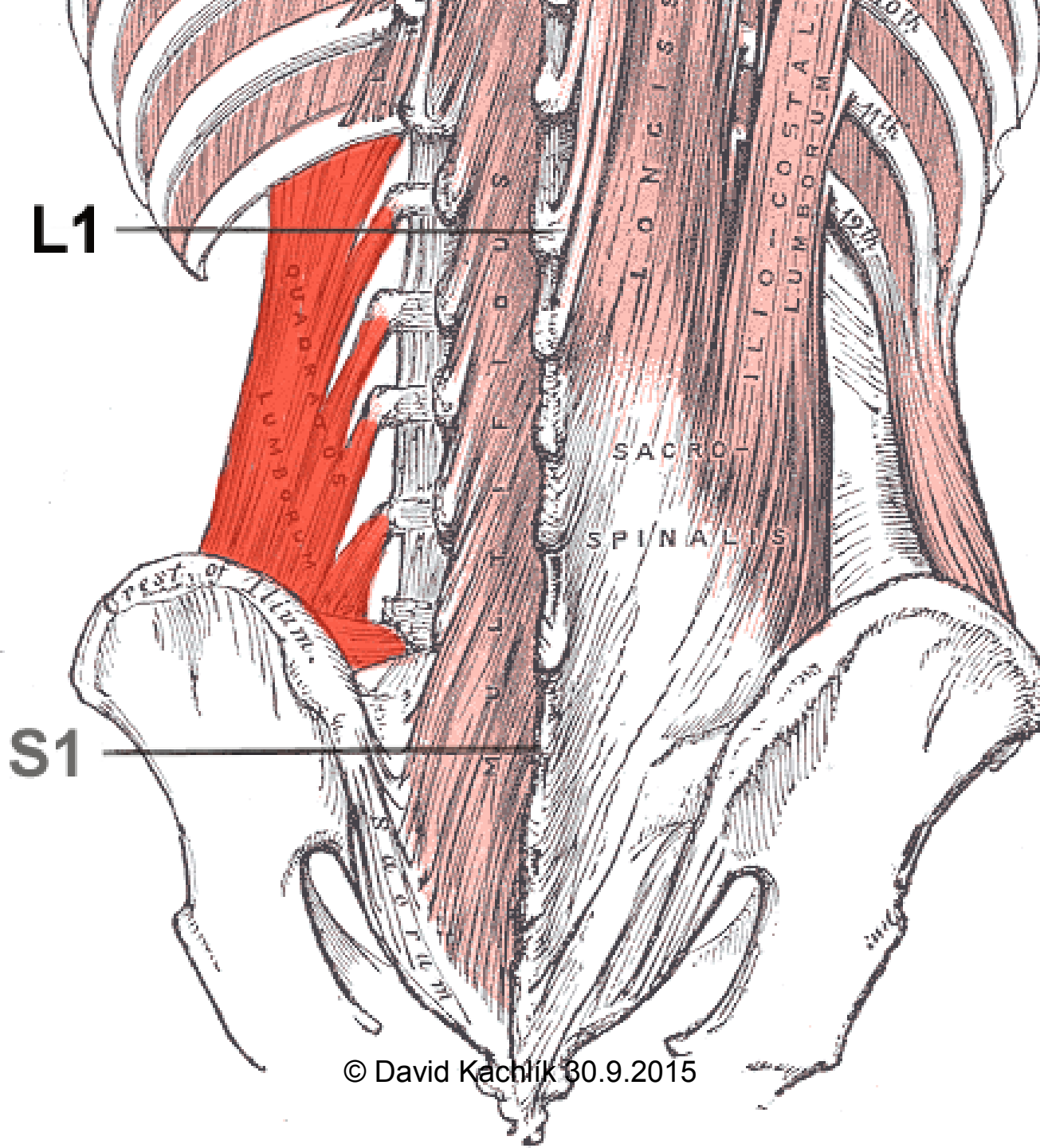
n. subcostalis

rr. anteriores nn.  
lumbalium L1-L3

lig. arcuatum laterale  
(quadratic arcade)

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# Mm. abdominis

## anterior group

- **m. rectus abdominis**

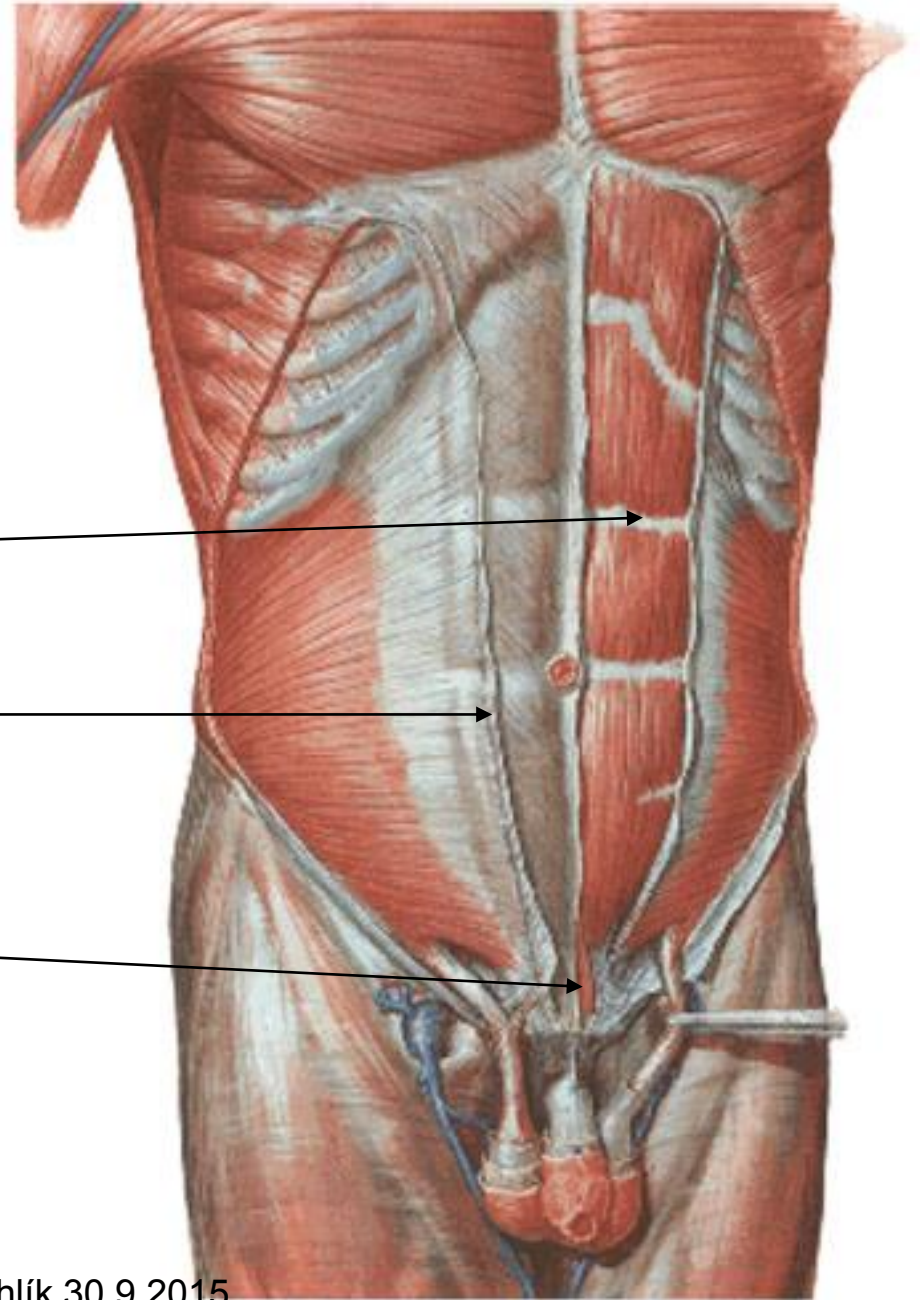
- intersectiones tendineae

- vagina m. recti abd.  
nn. intercostales 7.-12.

- **m. pyramidalis**  
n. subcostalis

linea alba

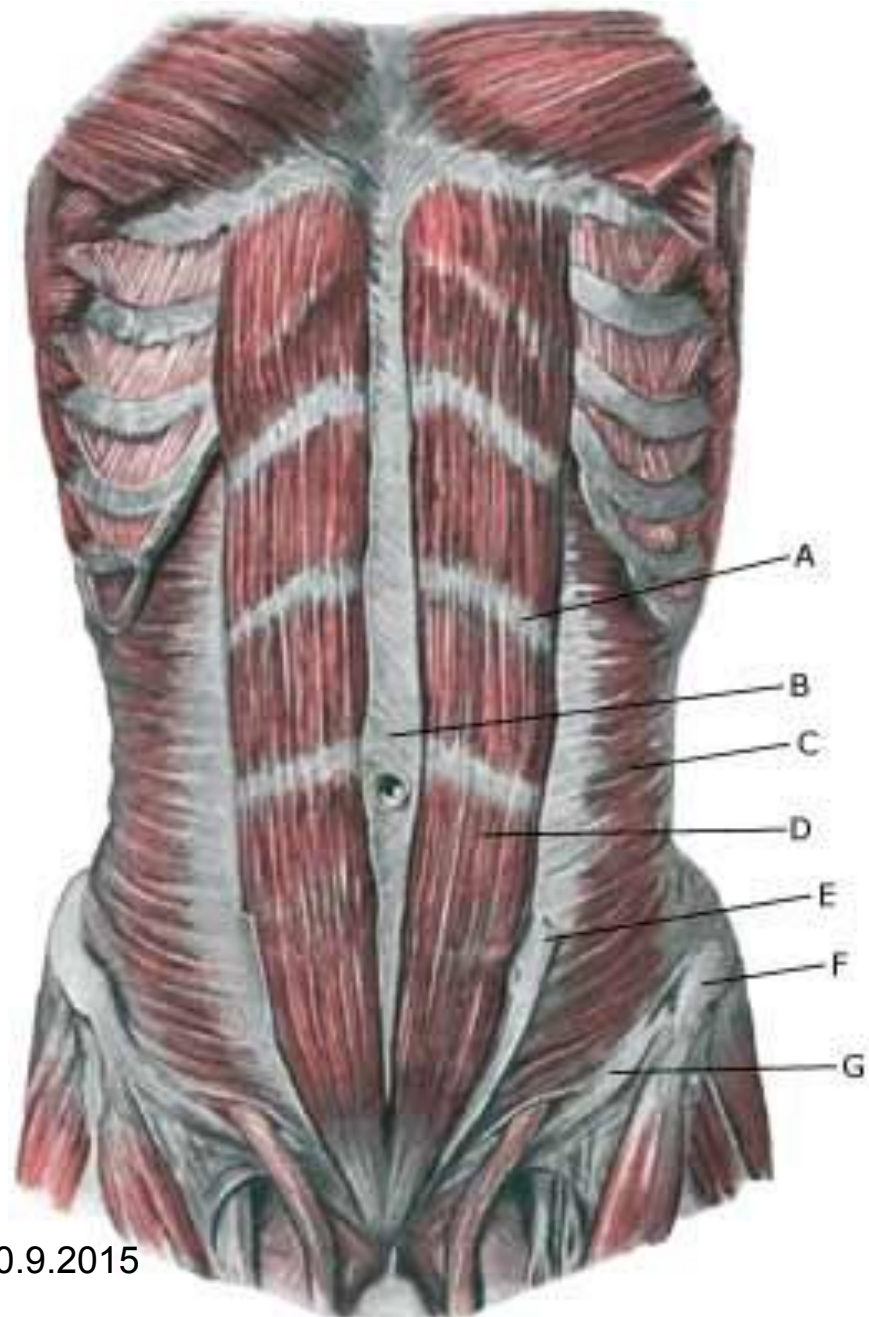
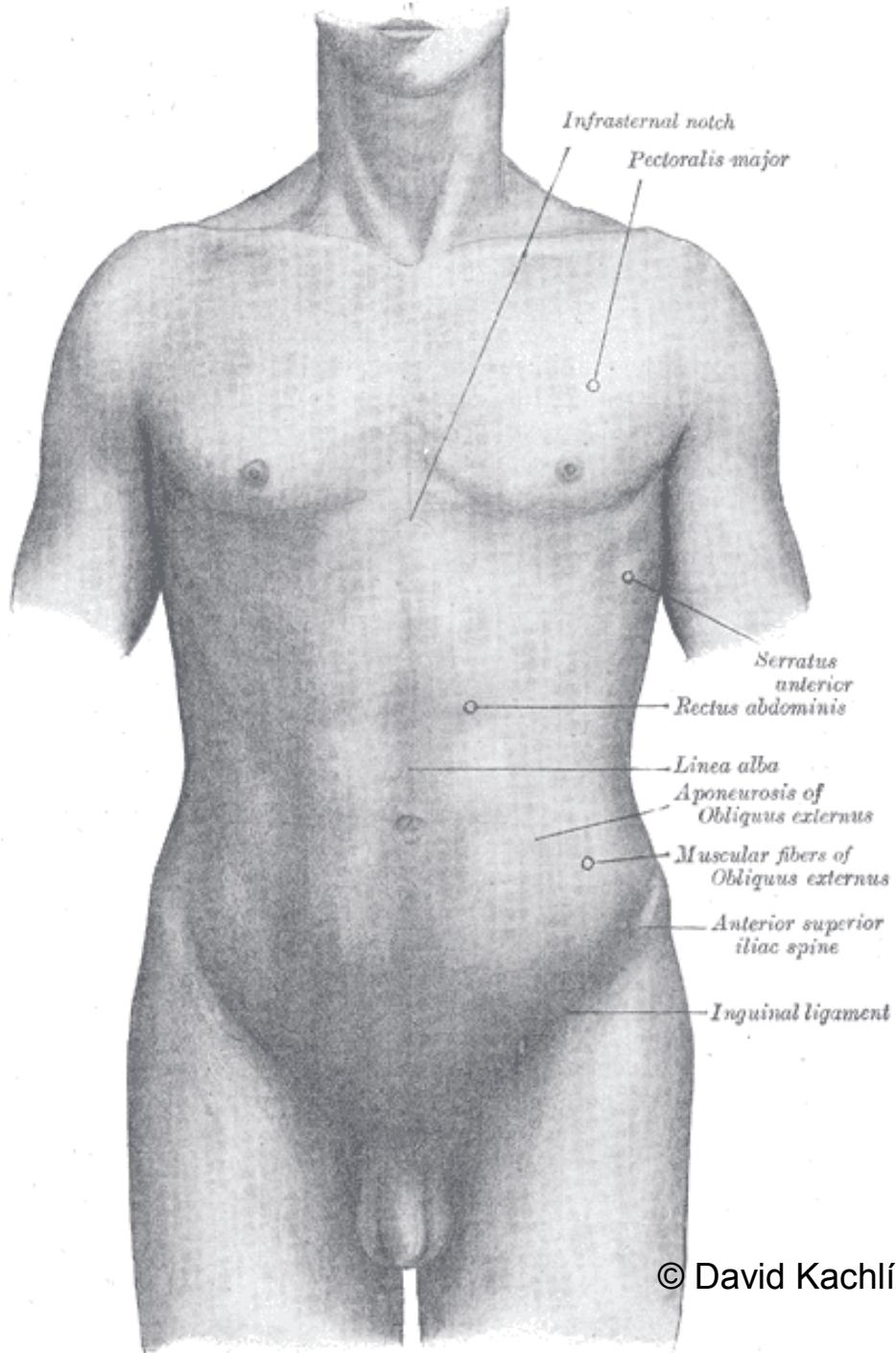
anulus umbilicalis



# Linea alba

- avascular fibrous band
- processus xiphoideus → symphysis pubica
- intermingled layer of m. rectus abdominis
- weakened spot → *herniation*
- *hyperpigmentation during gravidity*
- anulus umbilicalis (navel)
- weakened spot → *herniae*
  - *acquired hernia umbilicalis*
  - *inborn omfalocoele*





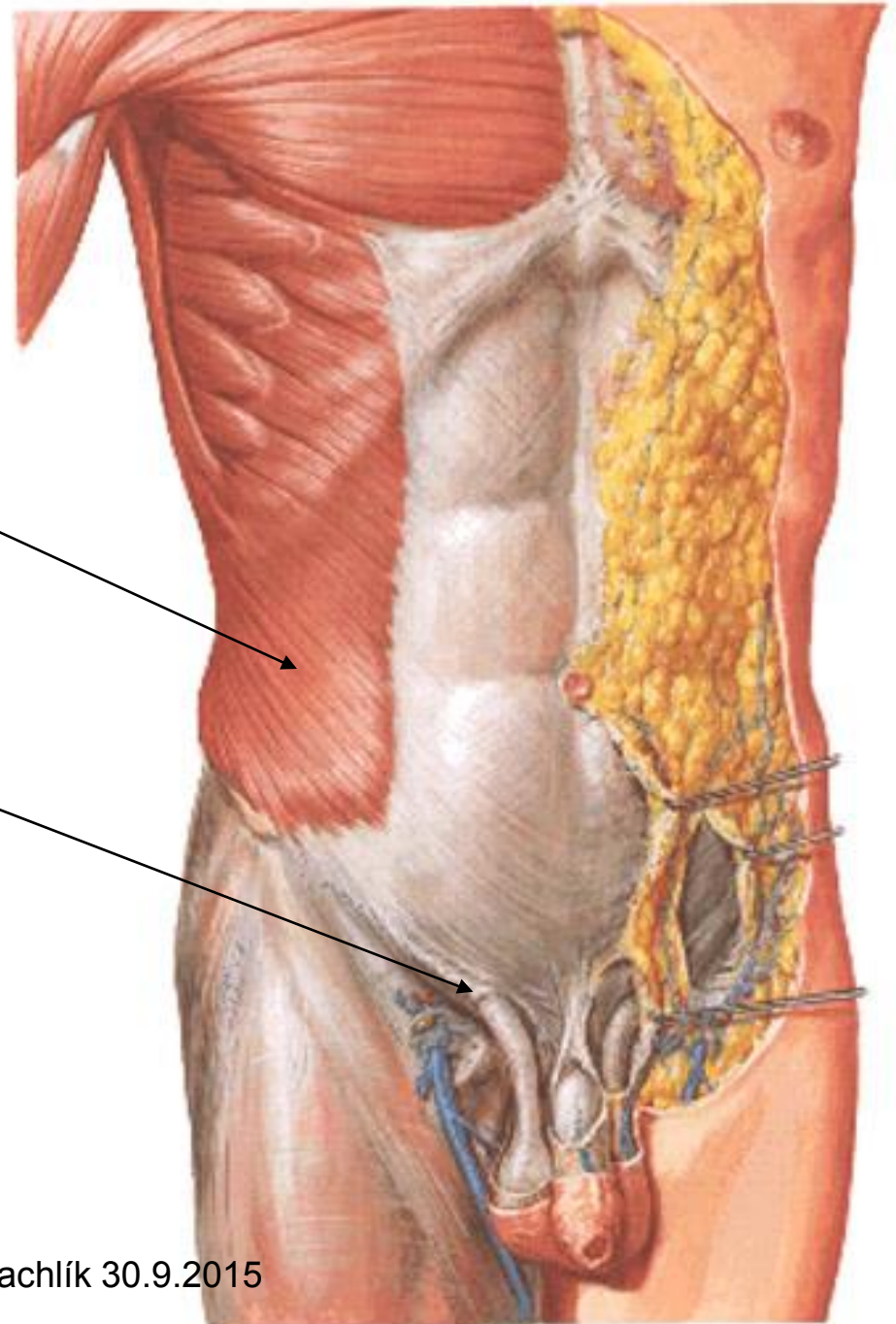
# Mm. abdominis

## lateral group

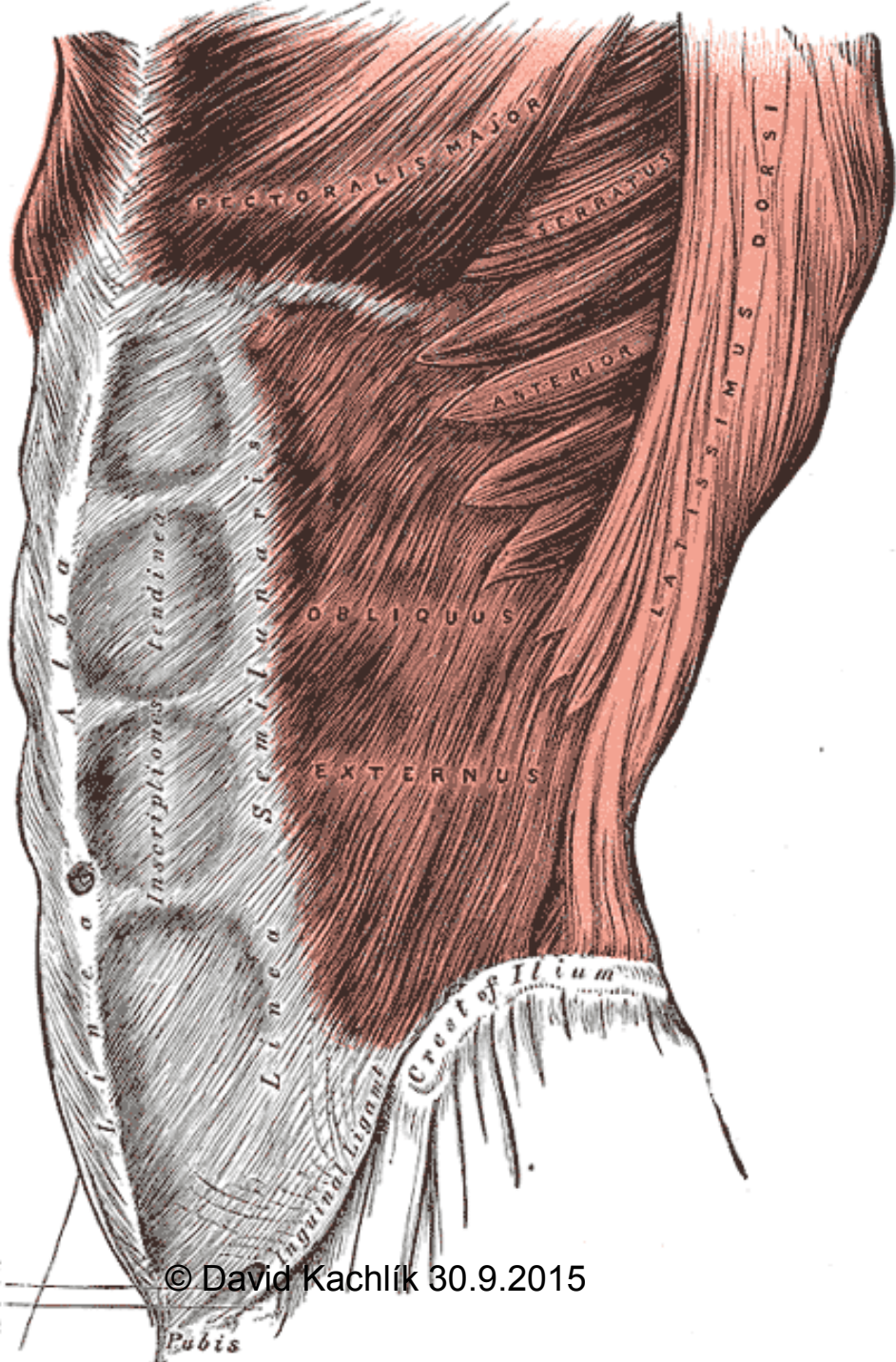
- **m. obliquus externus abd.**
  - lig. inguinale (*Poupartii*)
  - anulus inguinalis superficialis
    - crus med. + lat.
    - fibrae intercrurales

innervation:

nn. intercostales 5-12







PECTORALIS MAJOR

SERRATUS

ANTERIOR

LATISSIMUS DORSI

OBLIQUUS

EXTERNUS

Ligamentum Inguinale

Linea Semilunaris

Crest of Ilium

Subcutaneous  
inguinal ring  
Lacunar  
ligament

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Pubis

# Mm. abdominis

## lateral group

- **m. obliquus internus abd.**

- falx inguinalis (*Henlei*) = tendo conjunctivus (conjoint tendon)  
= joined inferior margin of aponeurosis m.o.i.a. + aponeurosis m.t.a.

- innervation:

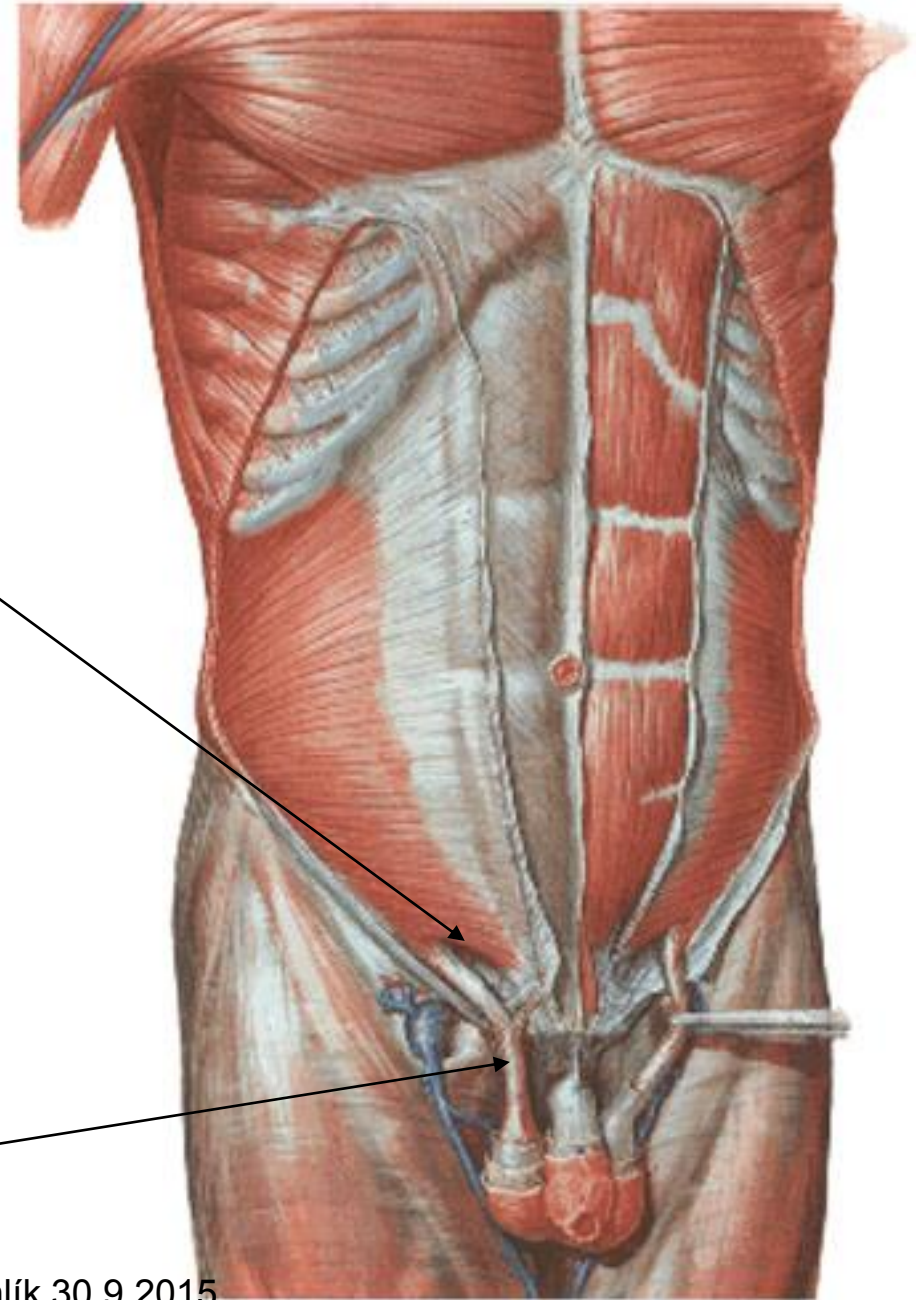
- nn. intercostales 8-12

- r. anterior n. lumbalis L1

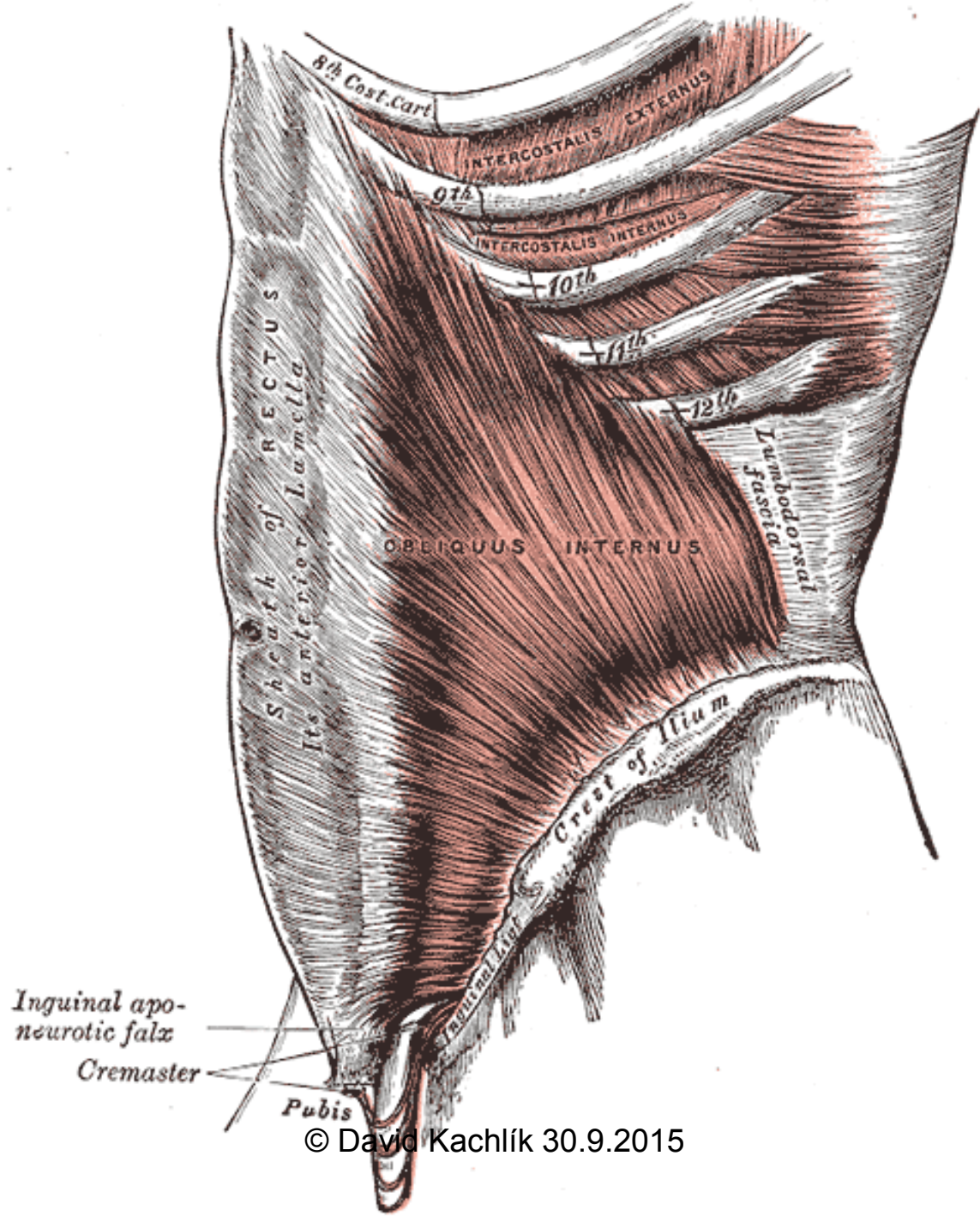
- n. iliohypogastricus + ilioinguinalis

- **m. cremaster** ♂

- r. genitalis n. genitofemoralis







# Mm. abdominis

## lateral group

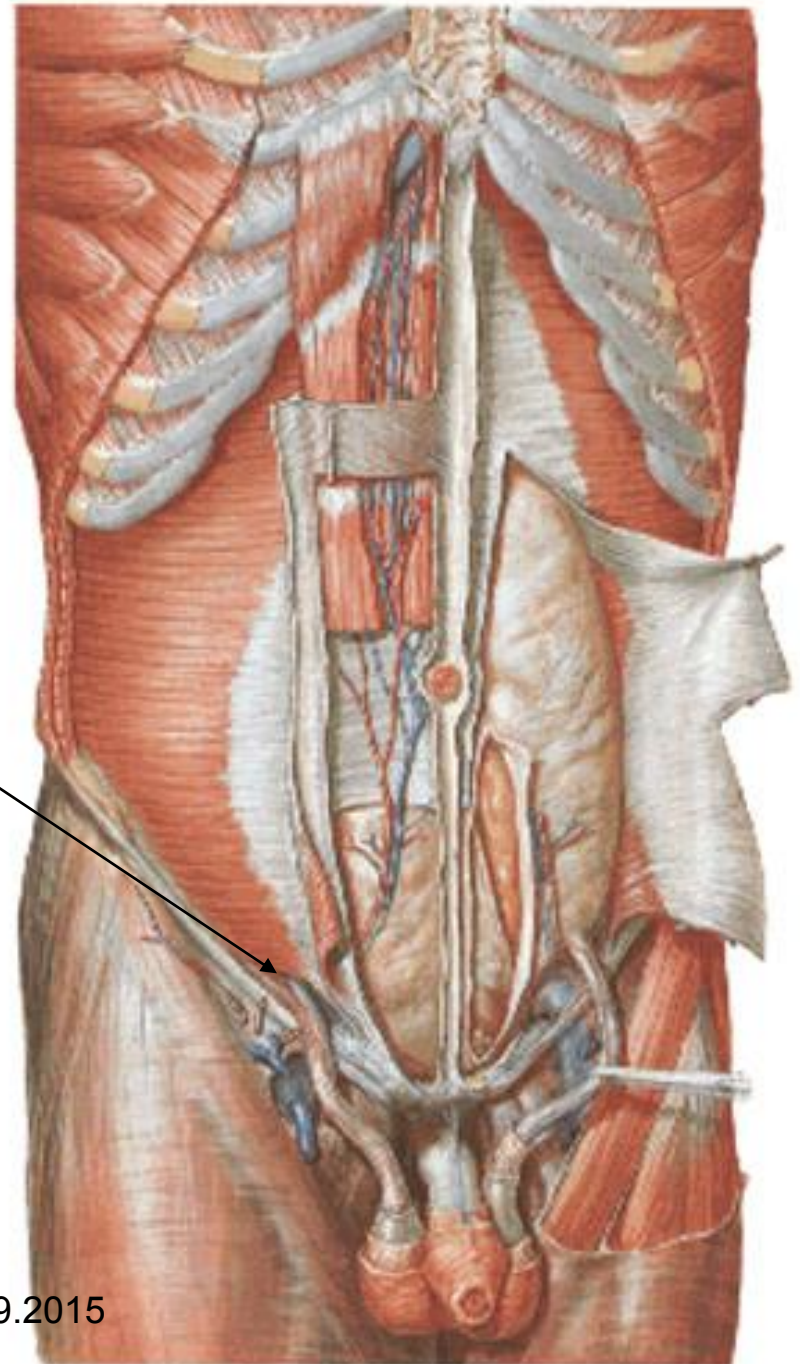
- **m. transversus abdominis**
  - falx inguinalis
  - lig. interfoveolare (*Hesselbachi*)
  - anulus inguinalis profundus
  - m. cremaster ♂

innervation:

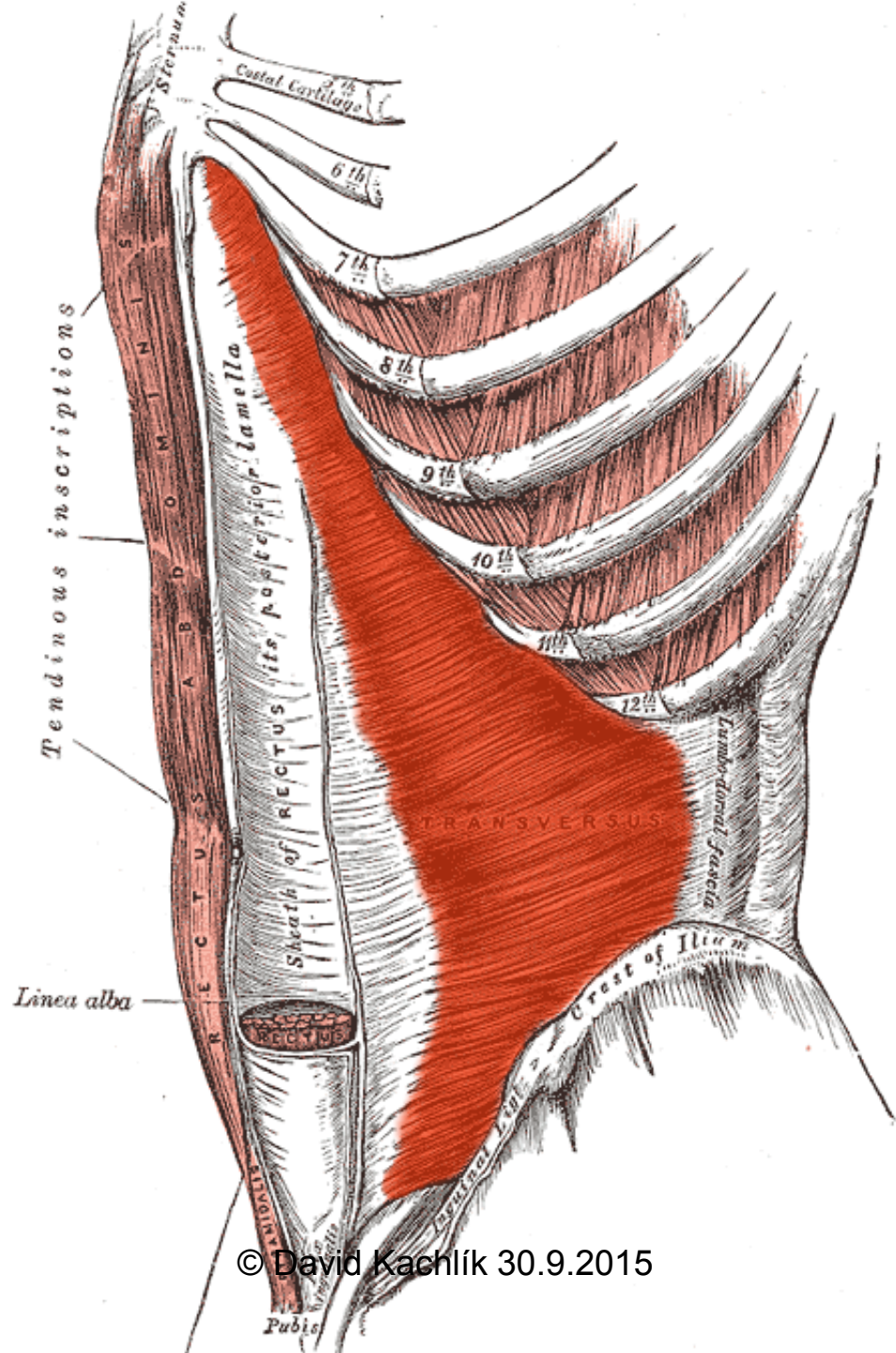
nn. intercostalis 7.-12.

r. anterior n. lumbalis L1

n. iliohypogastricus +  
ilioinguinalis







# M. cremaster ♂

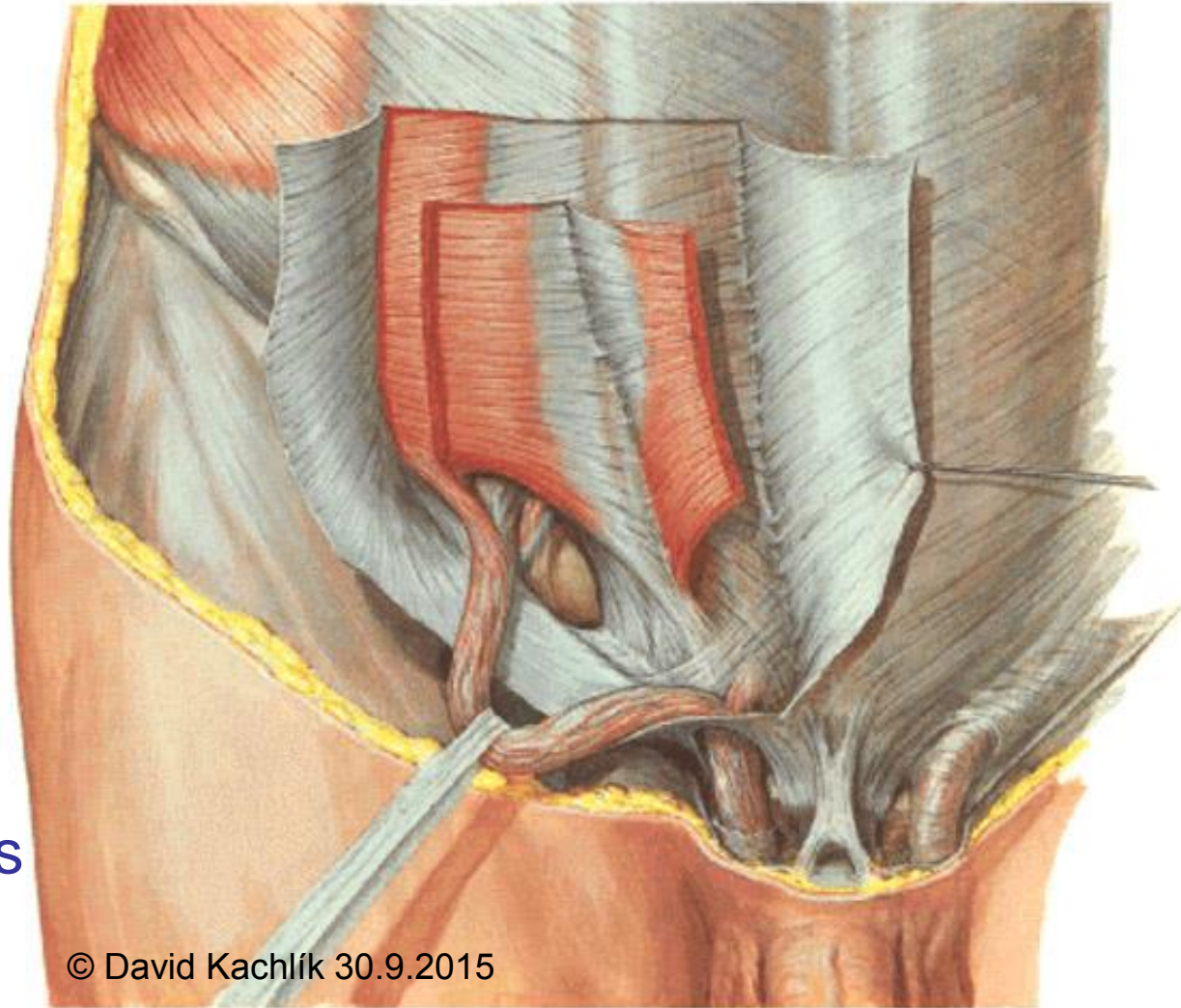
- derived from m. obliquus internus abd. + m. transversus abd.

- passing via canalis inguinalis

- covered with fascia cremasterica

- a. cremasterica is branch from a. epigastrica inferior

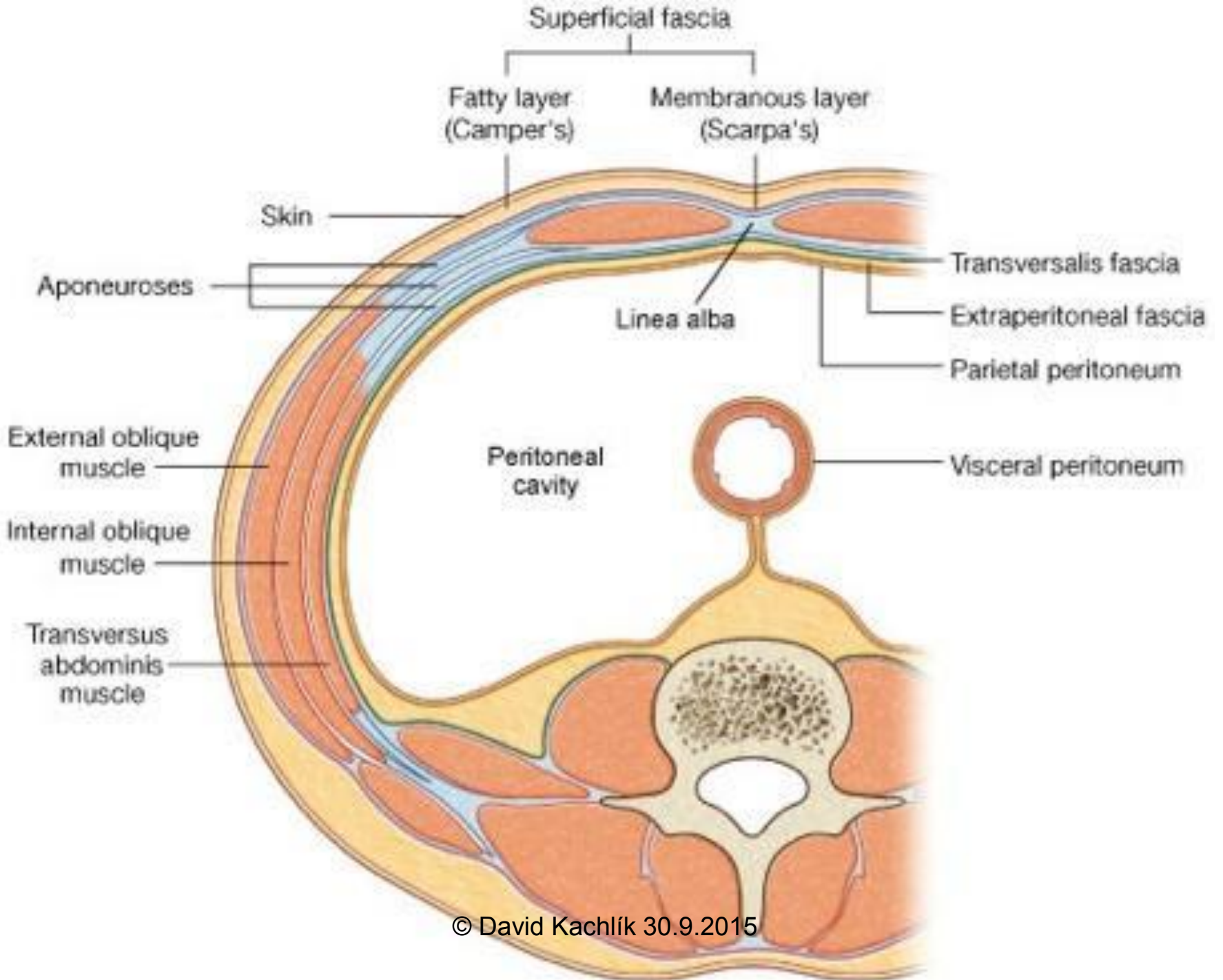
innervation: r. genitalis  
n. genitofemoralis



# Fasciae of abdominal cavity

- fascie abdominis parietalis (fascia endoabdominalis)
  - fascia transversalis
  - fascia iliopsoas (psoatica) (*m. psoas major*)
  - fascia iliaca (*m. iliacus*)
  - lamina anterior fasciae thoracolumbalis (*m. quadratus lumborum*)
  - fascia diaphragmatica inferior (*diaphragma*)
  - fascia umbilicalis

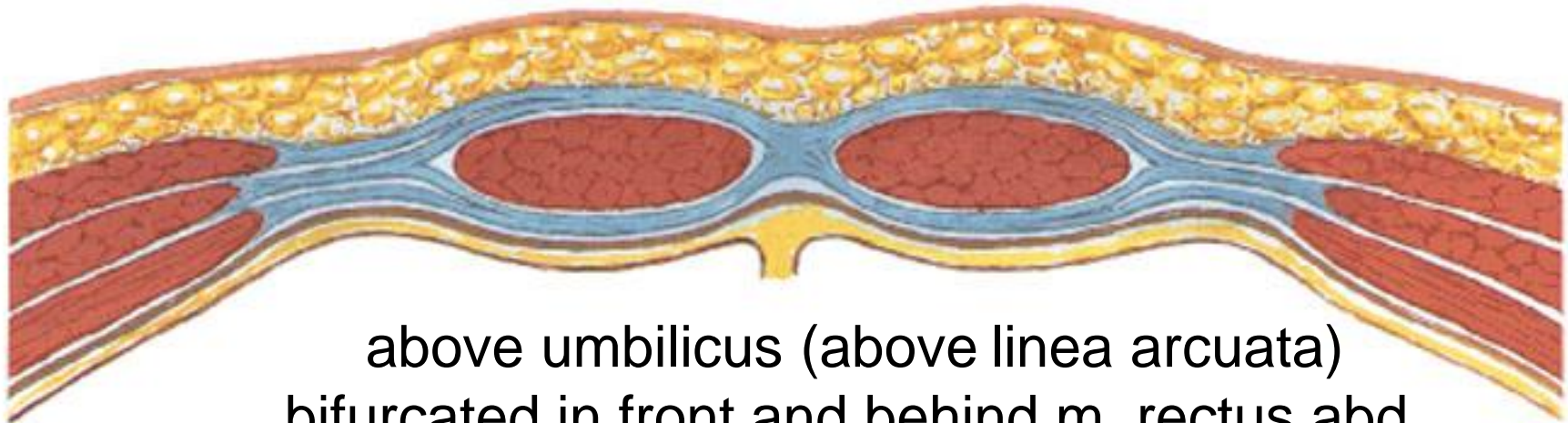




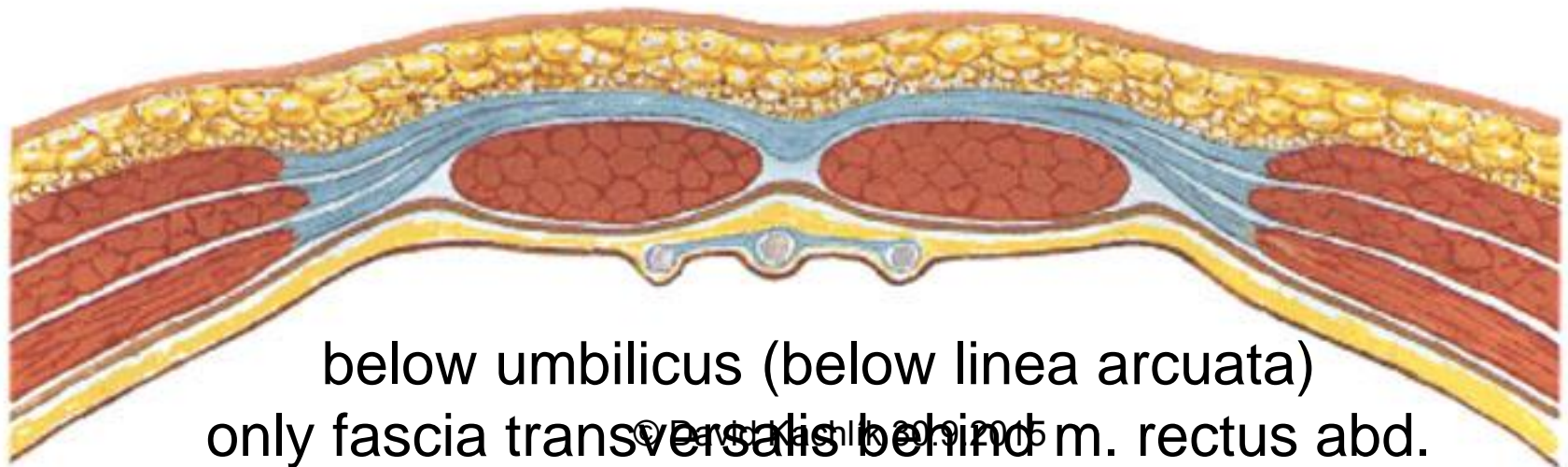


# Vagina m. recti abdominis

formed by aponeuroses of lateral abdominal muscles



above umbilicus (above linea arcuata)  
bifurcated in front and behind m. rectus abd.



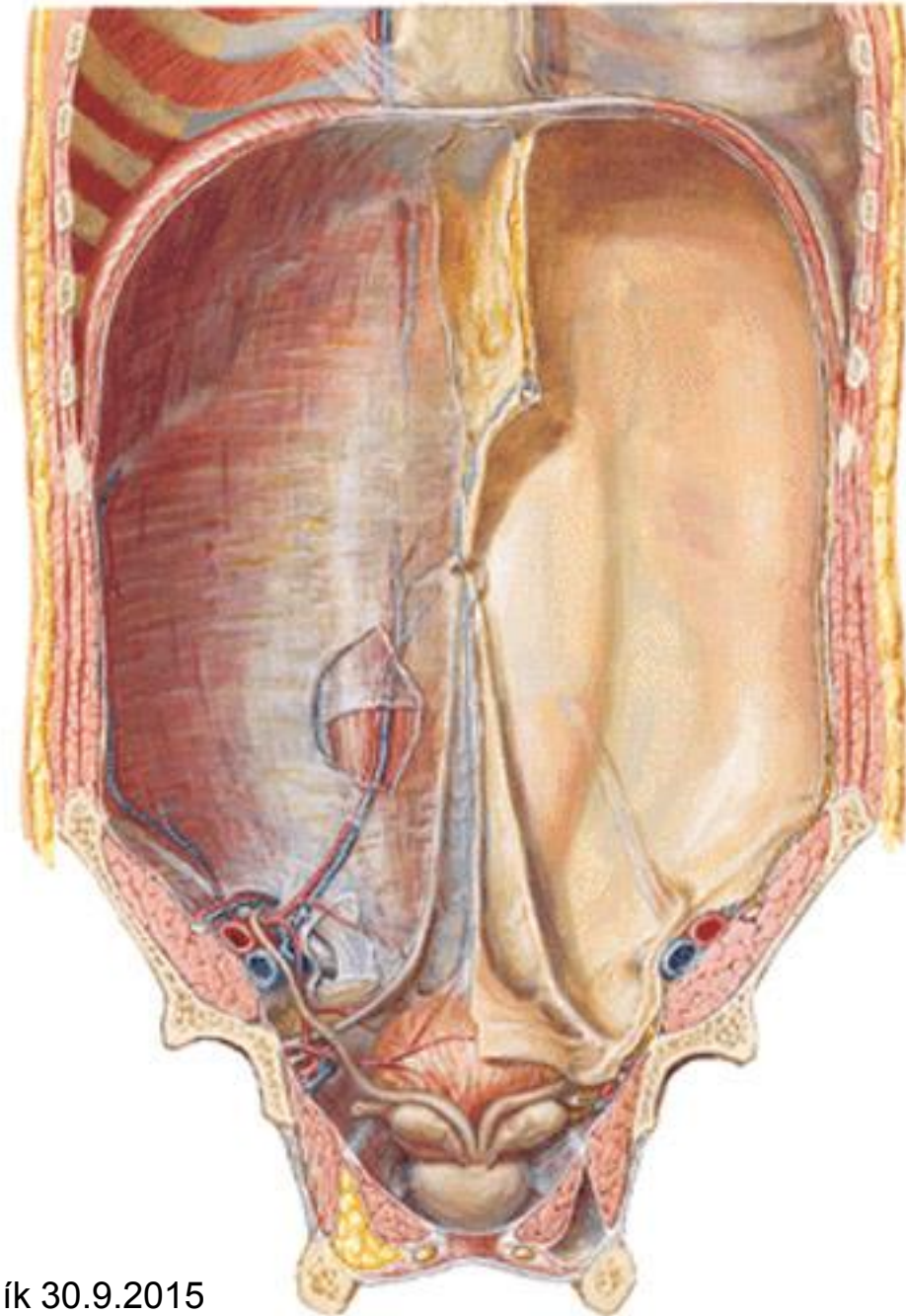
below umbilicus (below linea arcuata)  
only fascia transversalis behind m. rectus abd.

# Anterior abdominal wall

- skin
- *Camper's layer* (= panniculus adiposus telae subcutaneae abdominis)
- fascia abdominis subcutanea *Scarpae* (= stratum membranosum telae subcutaneae abdominis )
- fascia abdominis superficialis
- m. obliquus externus abdominis
- m. obliquus internus abdominis
- m. transversus abdominis
- (m. rectus abdominis *in the sheath* + m. pyramidalis)
- fascia transversalis
- (fascia extraperitonealis) + preperitoneal fat pad
- lamina parietalis peritonei

# Structures in the anterior wal

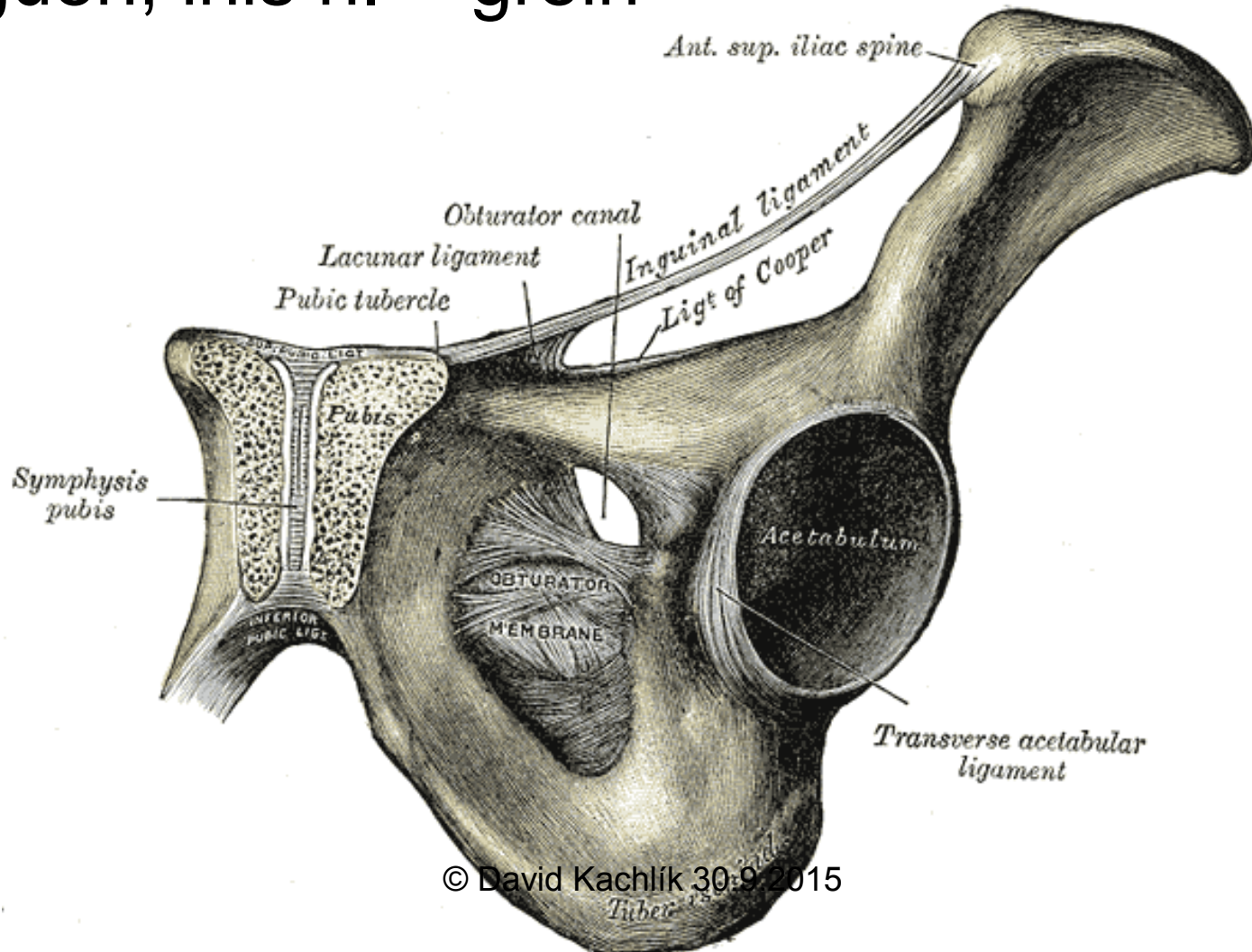
- anulus umbilicalis
  - contains lig. umbilicale laterale + lig. teres hepatis
- linea alba
- linea arcuata (*Douglasi*)
- linea semilunaris (*Spiegelii*)
- anulus inguinalis superficialis et profundus





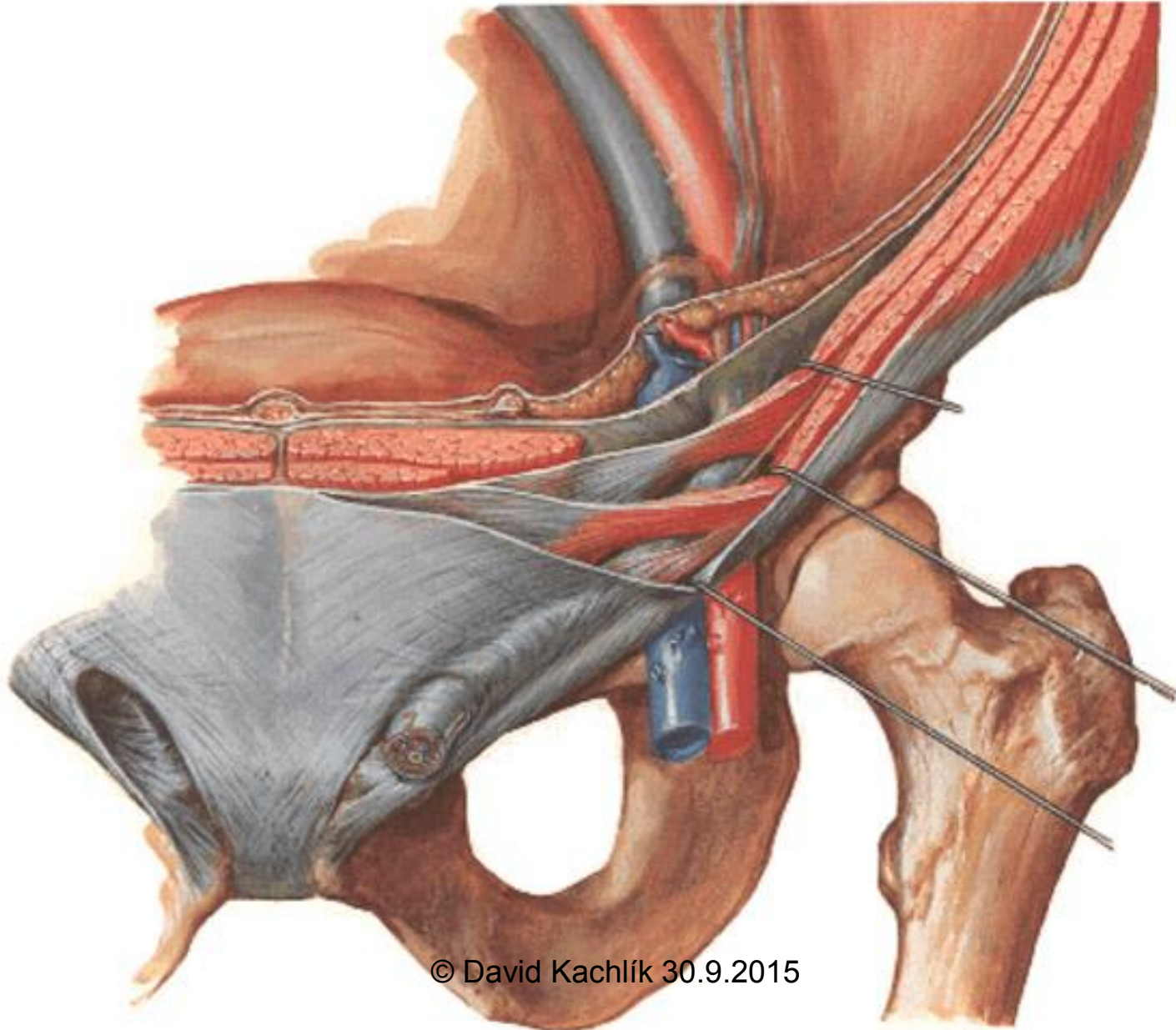
# Lig. inguinale Poupartii

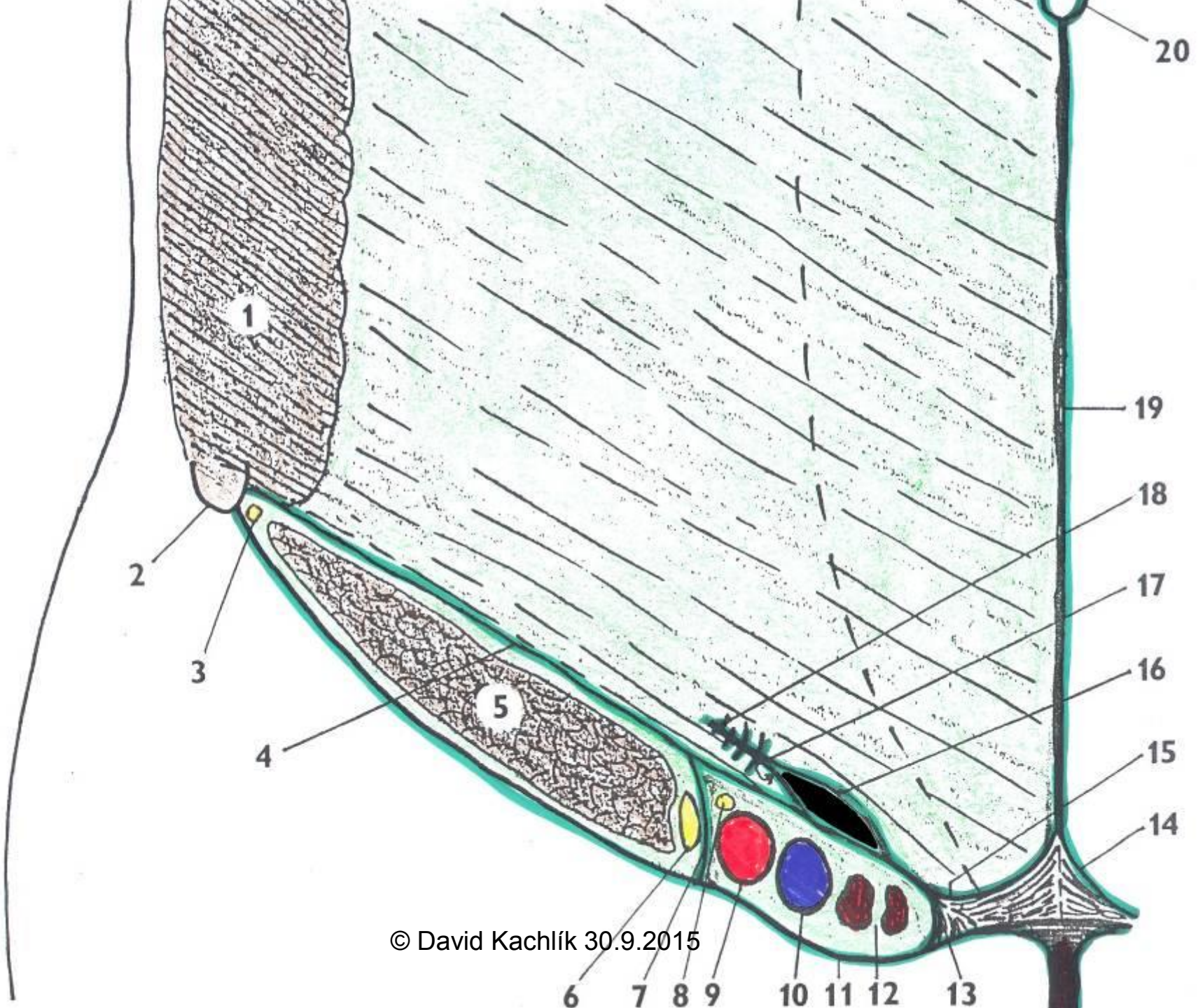
- inguen, inis n. = groin





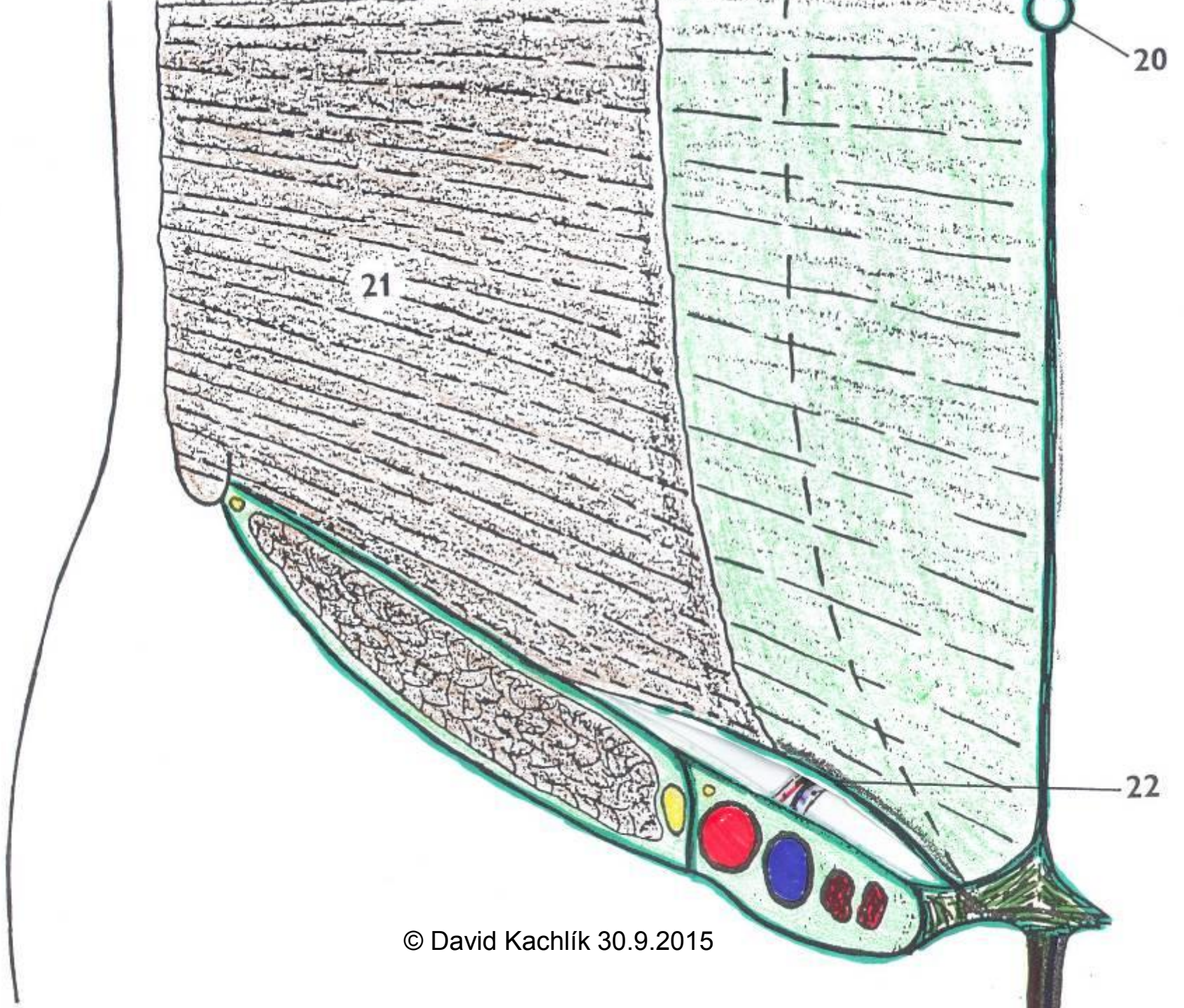
# *Canalis inguinalis*



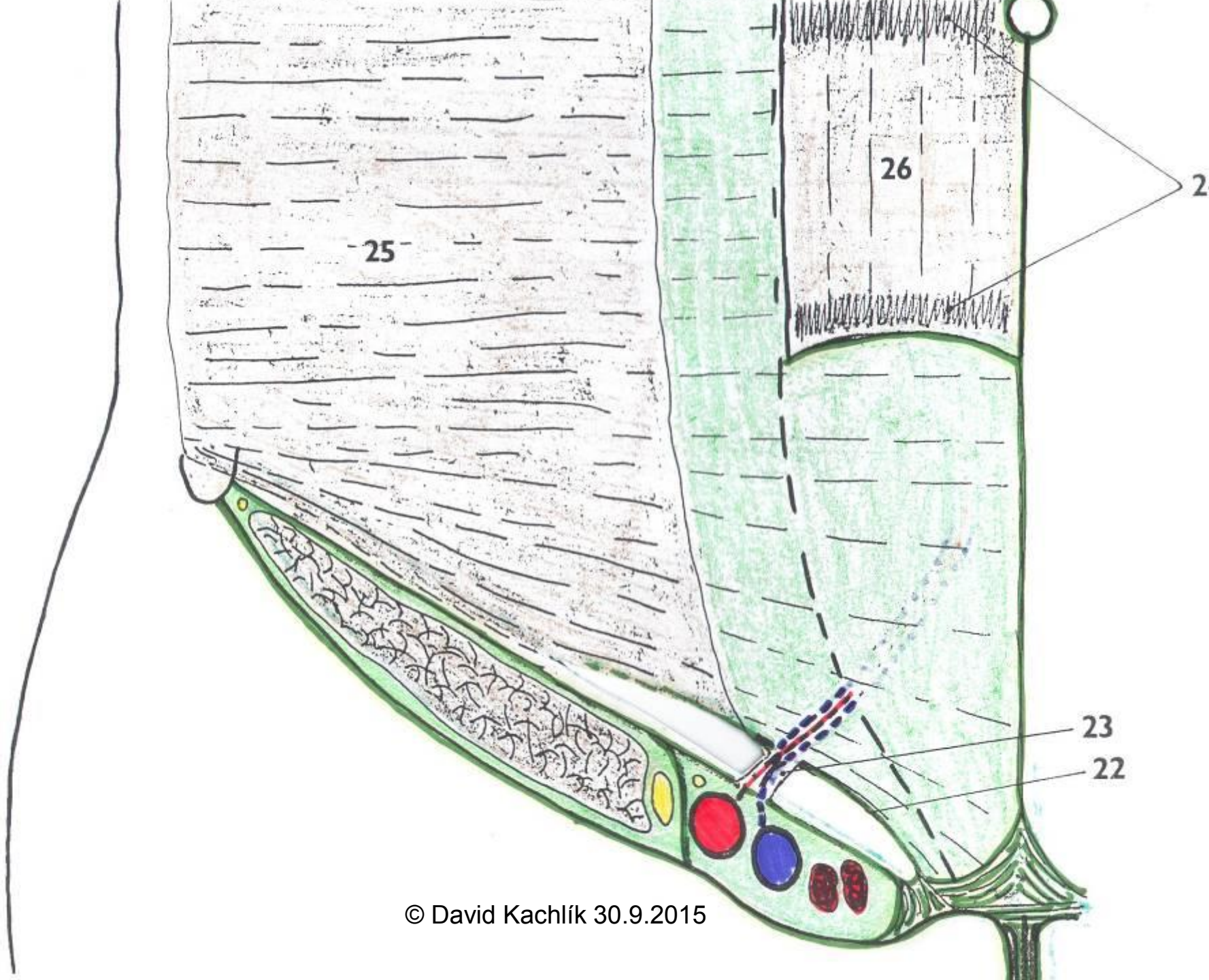


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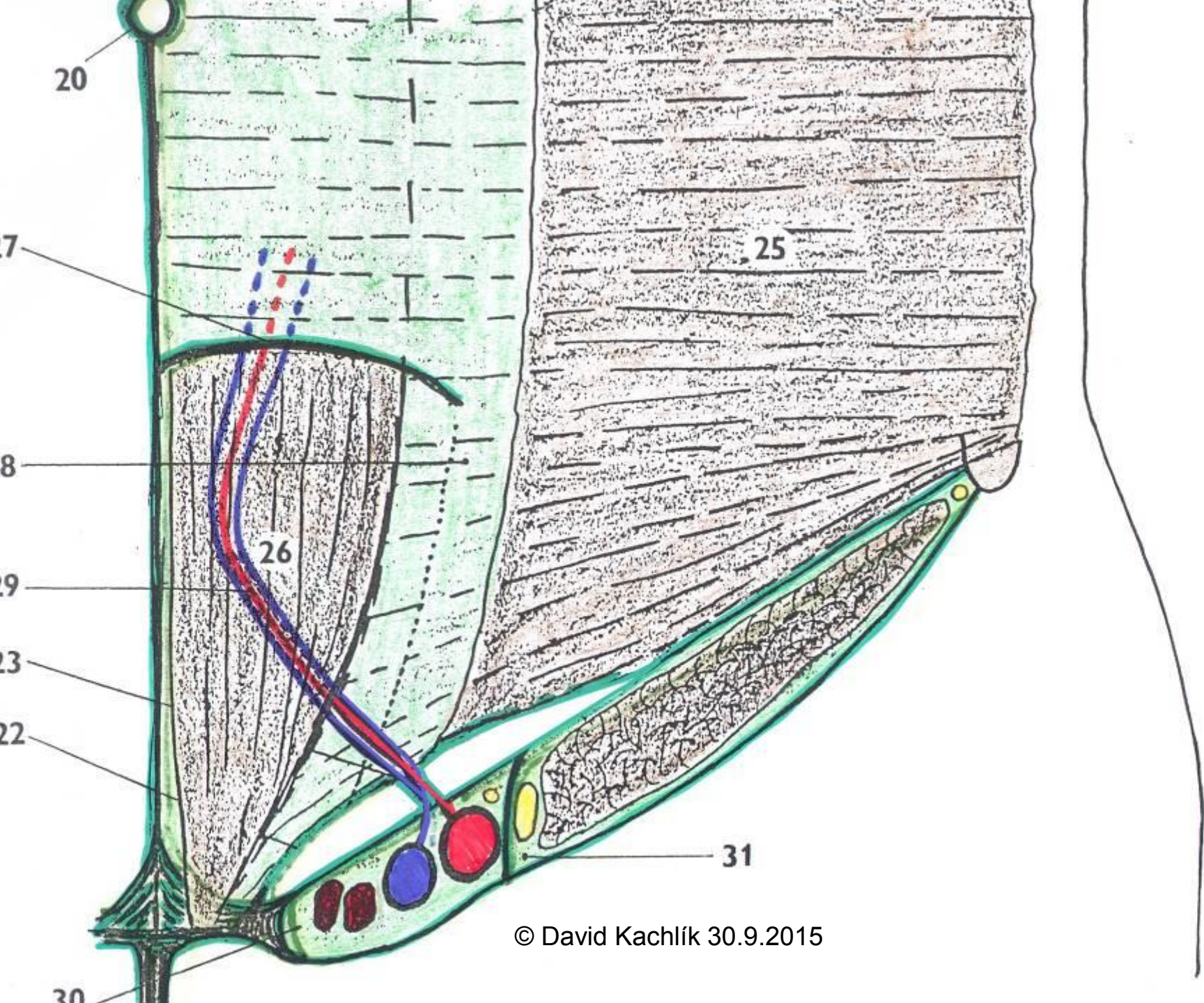






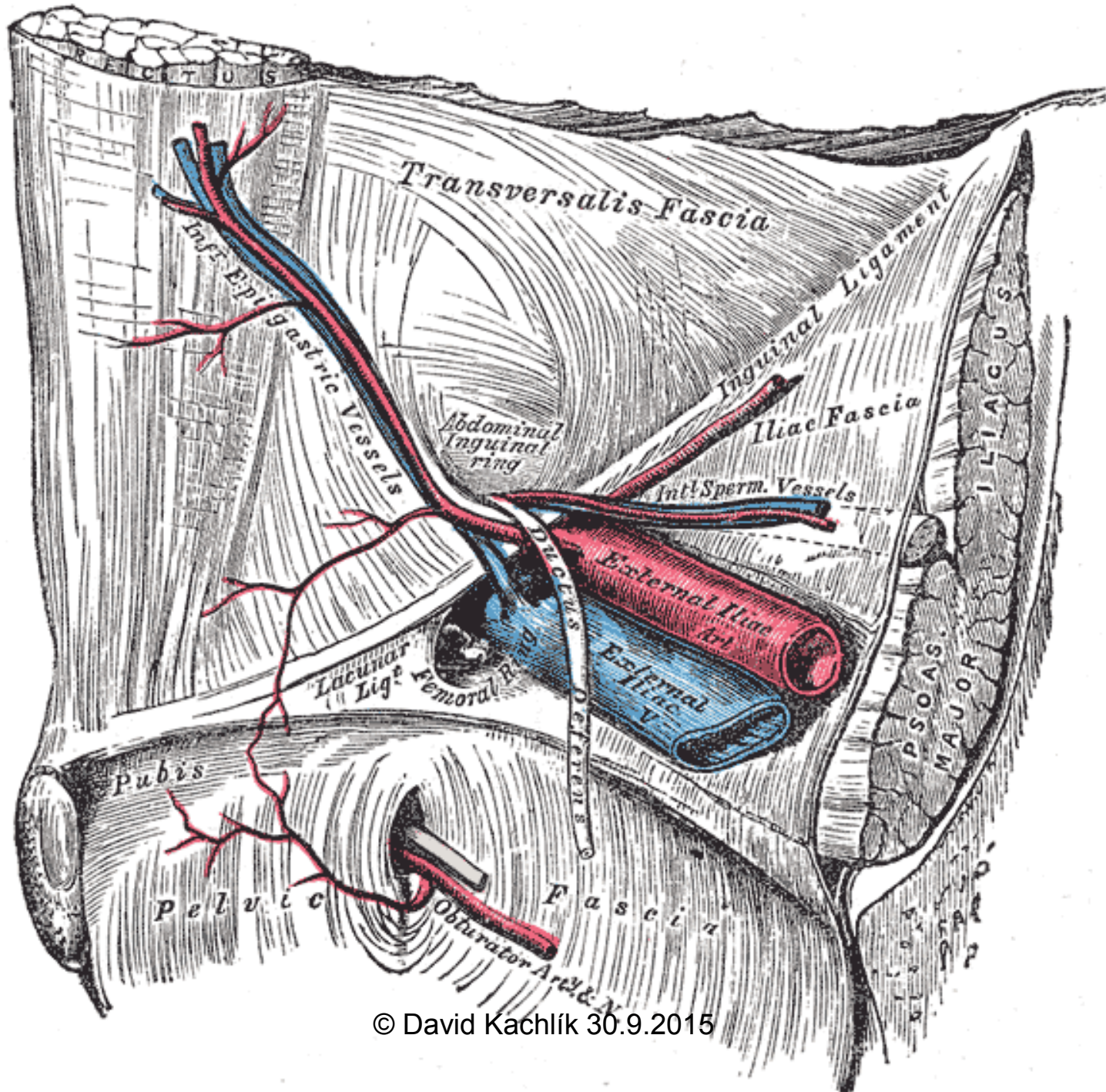




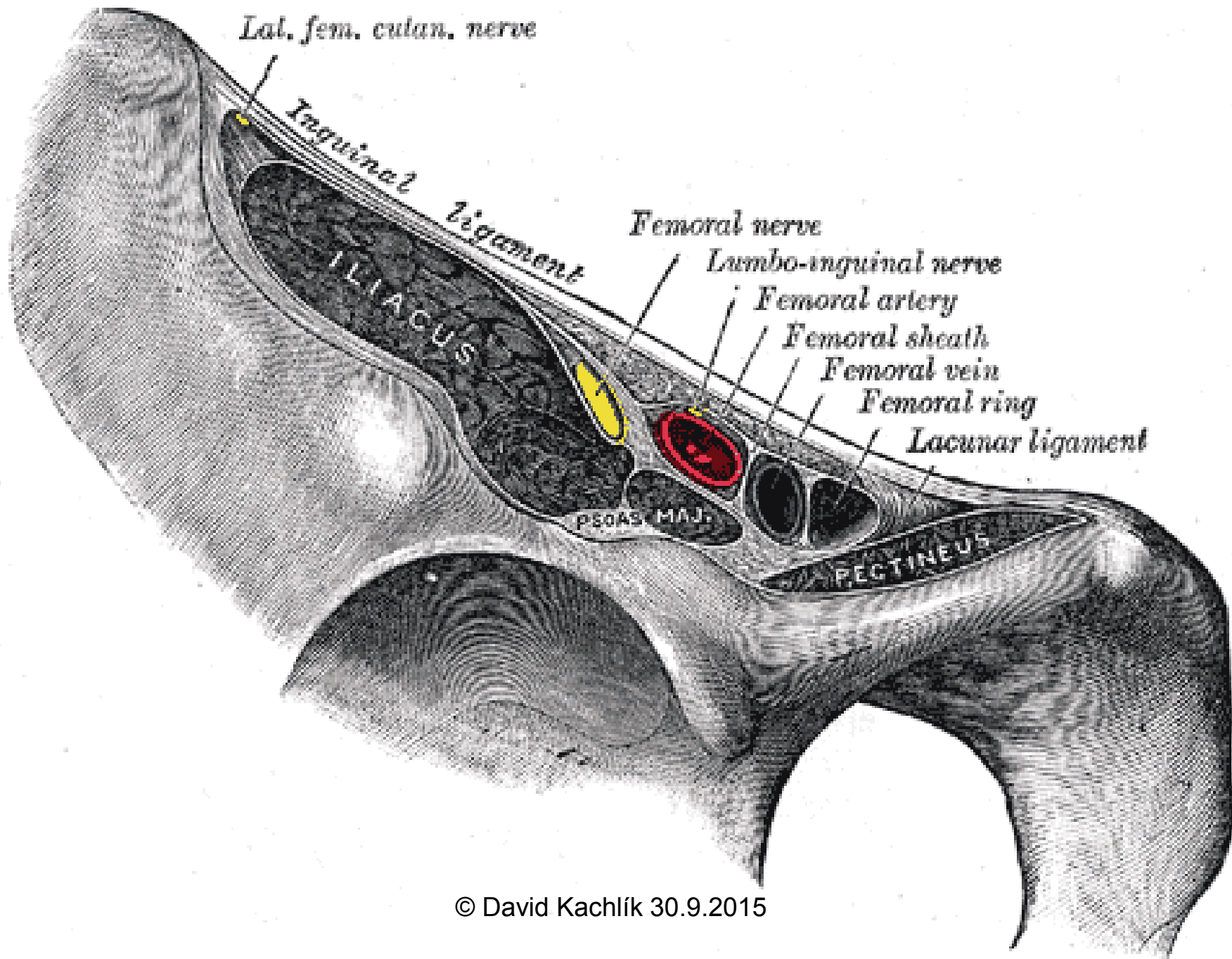


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# Content of canalis inguinalis

- n. ilioinguinalis
- r. genitalis n. genitofemoralis
- vestigium processus vaginalis peritonei
- a. et v. cremasterica / a. et v. lig. teretis uteri
- lymph vessels

**female:** lig. teres uteri

**male:** ductus deferens

- a. testicularis
- a. ductus deferentis
- plexus pampiniformis (*venous plexus*)
- plexus deferentialis et testicularis (*nervous plexuses*)

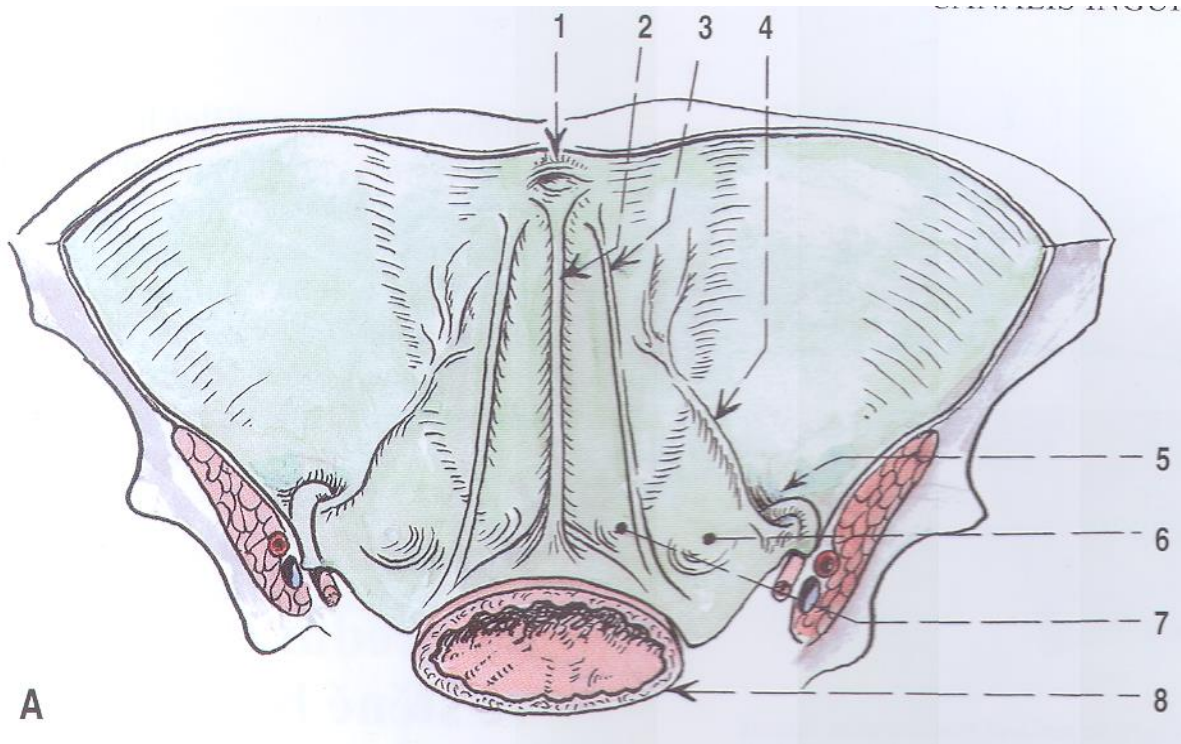
# Anterior abdominal wall – internal aspect

## without peritoneum – with peritoneum

- lig. umbilicale medianum (chorda urachi)
- fascia vesicoumbilicalis (*Delbeti*)
- chorda arteriae umbilicalis (lig. umbilicale laterale)
- trigonum inguinale (*Hesselbachi*) (+ tractus iliopubicus *Thomsoni*)
- vasa epigastrica inferiora
- anulus inguinalis profundus

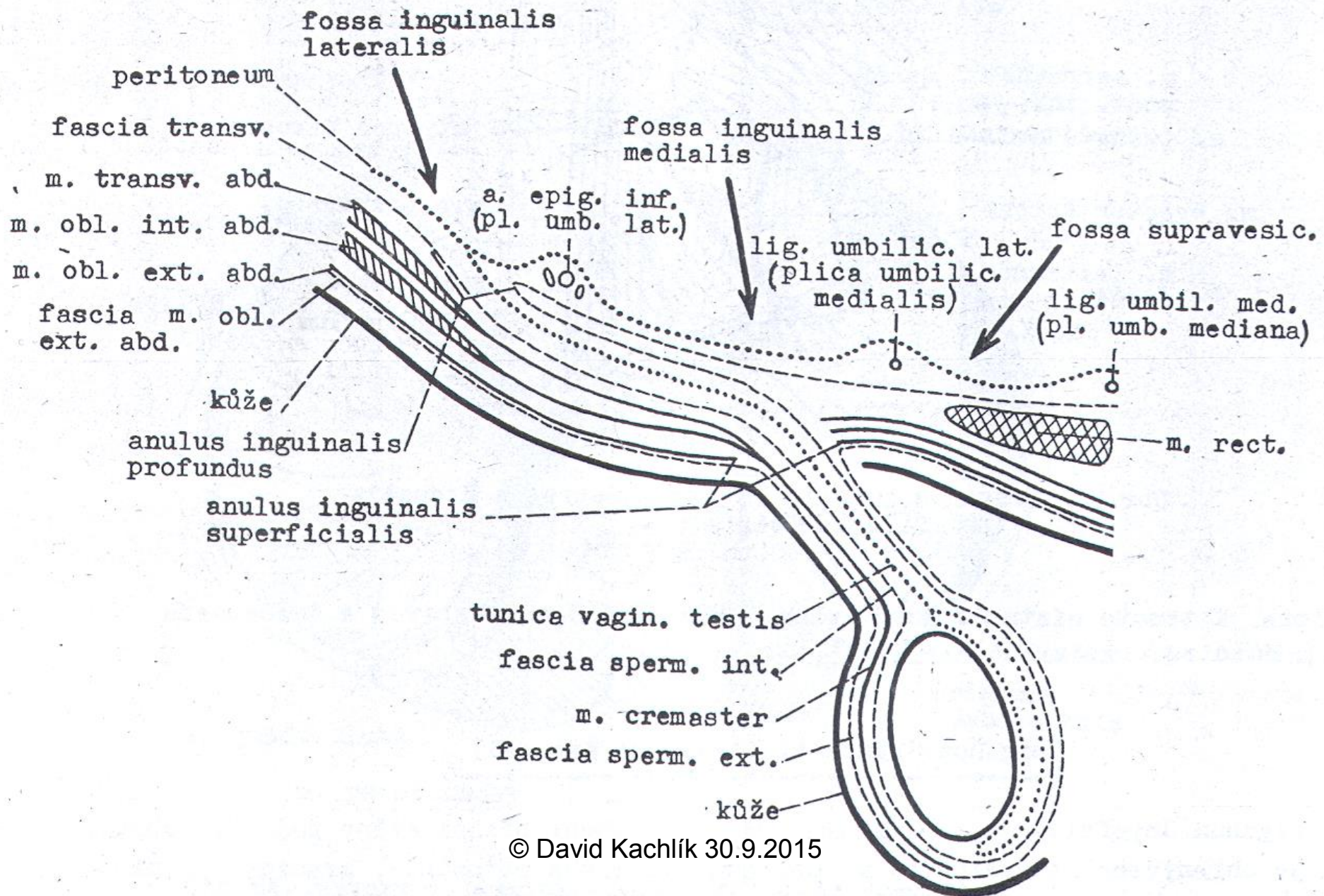
- plica umbilicalis mediana
- fossa supravesicalis
- plica umbilicalis medialis
- fossa inguinalis medialis
- plica umbilicalis lateralis (plica epigastrica)
- fossa inguinalis lateralis





A

- A peritoneum na přední stěně břišní
- 1 umbilicus
  - 2 plica umbilicalis mediana
  - 3 plica umbilicalis medialis
  - 4 plica umbilicalis lateralis
  - 5 fossa inguinalis lateralis (vkleslá v místě anulus inguinalis profundus)
  - 6 fossa inguinalis medialis (vkleslá v místě anulus inguinalis superficialis a trigonum inguinale)
  - 7 fossa supravesicalis
  - 8 řez močový měchýř





# Herniae

- **hernia inguinalis indirecta**

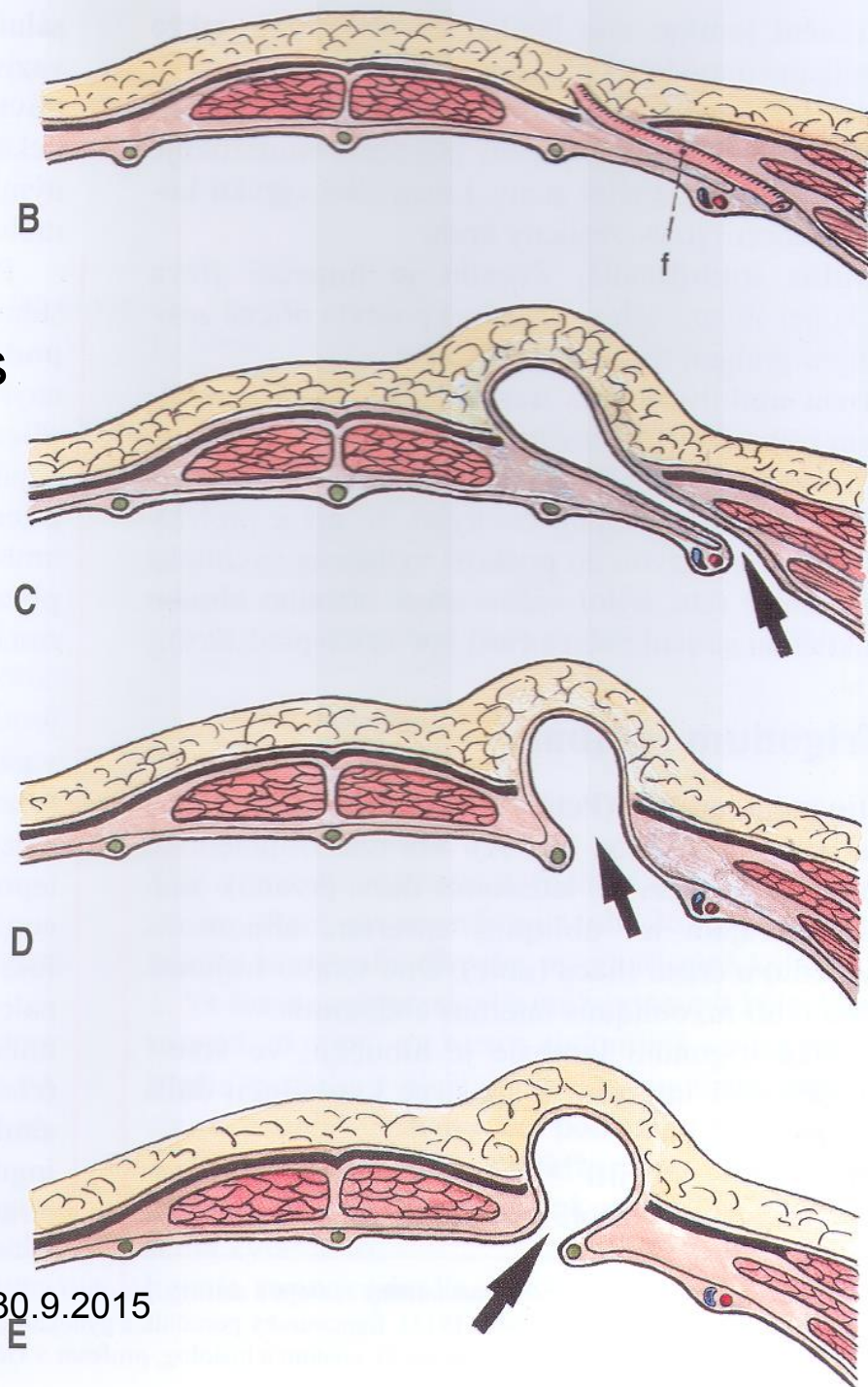
- passes through anulus inguinalis profundus and superficialis  
it means through the whole canal

- **hernia inguinalis directa**

- passes through trigonum inguinale (*Hesselbachi*) and anulus inguinalis superficialis

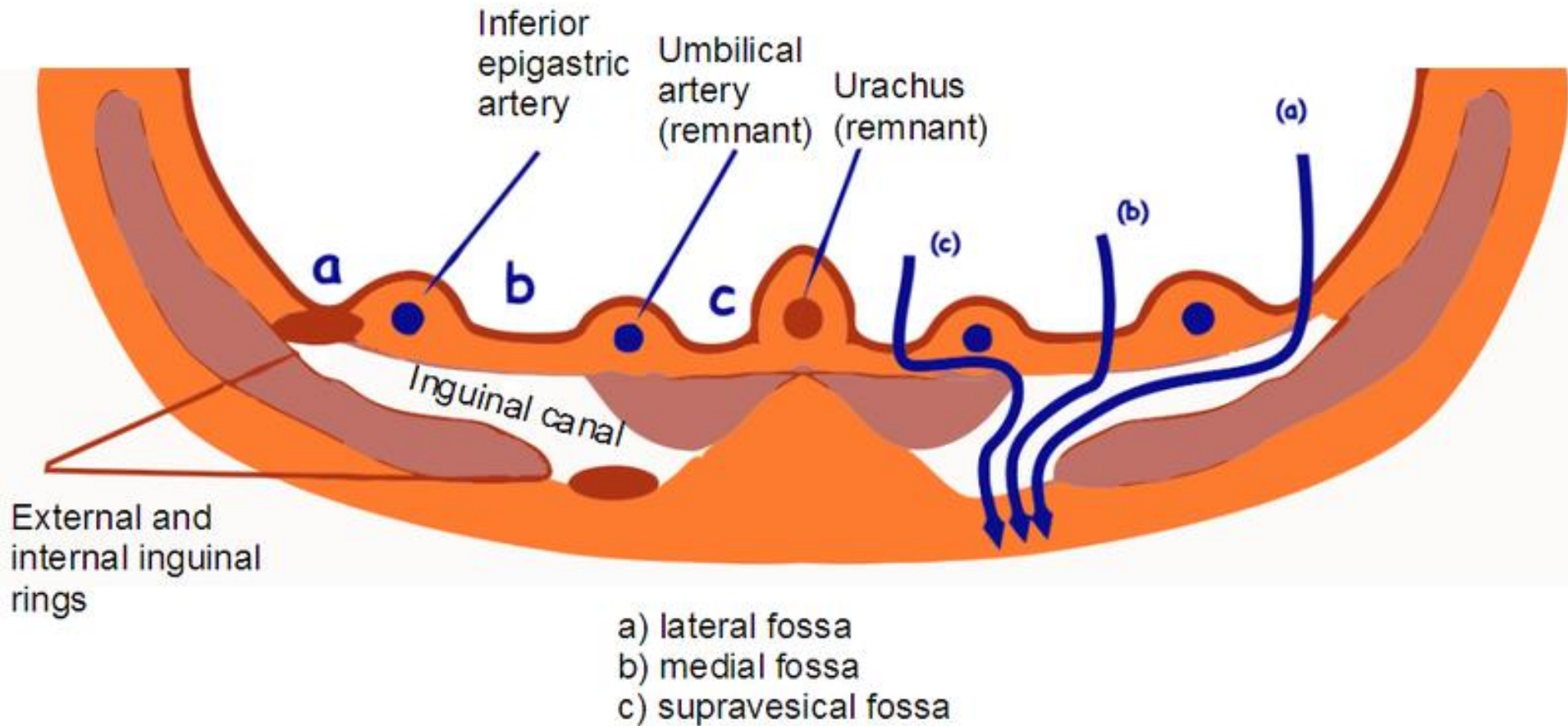
- **hernia supravesicalis**

- passes through fovea supravesicalis and anulus inguinalis superficialis

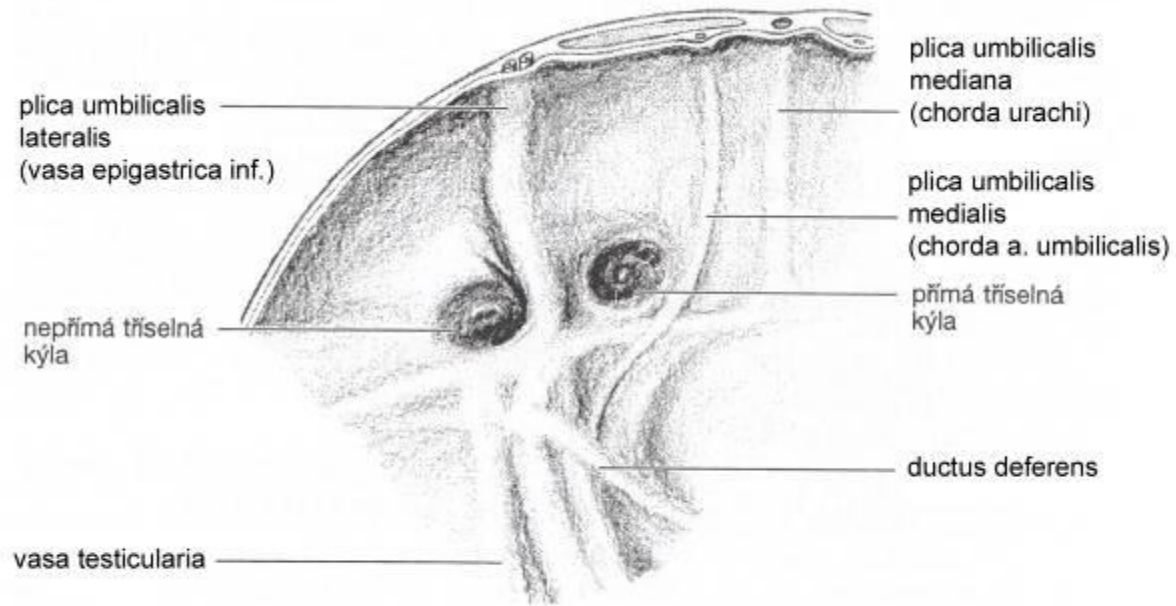




# Herniae

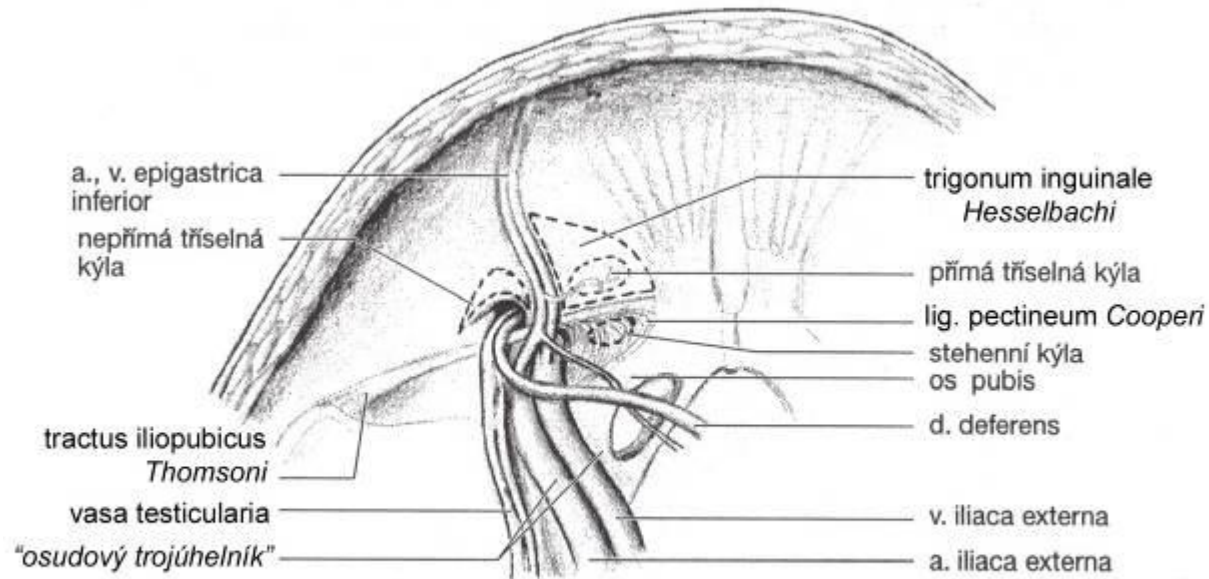


# Laparoscopic view of canalis ingunalis region



*Tříselná krajina vlevo z laparoskopického pohledu*

*Michalský, Pařko, Satinský: Operační léčení tříselné kýly, 2000.*



*Tříselná krajina vlevo bez peritoneálního listu*

*Michalský, Pařko, Satinský: Operační léčení tříselné kýly, 2000.*



Hernia inguinalis  
dextra

Cicatrix post  
herniotomiam sinistram



*Oboustranná tříselná kýla. Vlevo přímá, vpravo nepřímá kýla  
Michalský, Pařko, Satinský: Operační léčení tříselné kýly, 2000.*



*Michalský, Pařko, Satinský: Operační léčení tříselné kýly, 2000.*



*Foto 18 Pómeč na plusíku proximo-laterálně od neoanulu. Překřížení cípů sítky  
proximo-laterálně od funikulu  
Michalský, Pařko, Satinský: Operační léčení tříselné kýly, 2000.*

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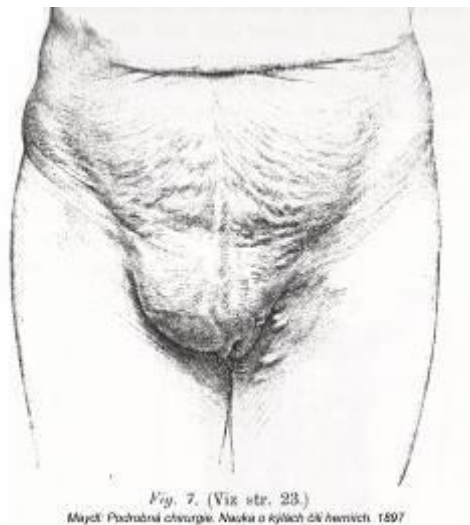


Fig. 7. (Viz str. 23.)  
Maydl: Podrobná chirurgie. Nauka o kýlách čili herních. 1897



Fig. 9. (Viz str. 23.)

Maydl: Podrobná chirurgie. Nauka o kýlách čili herních. 1897

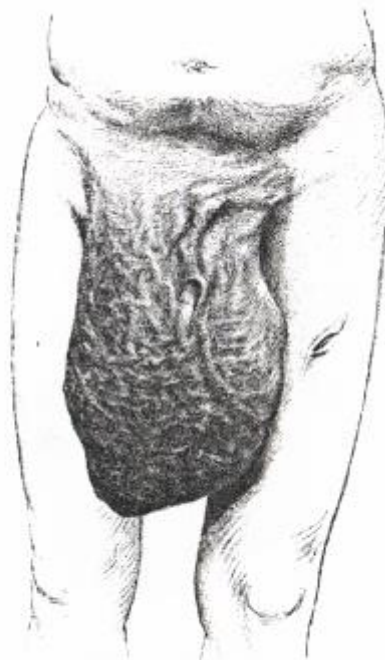


Fig. 10. (Viz str. 23.)

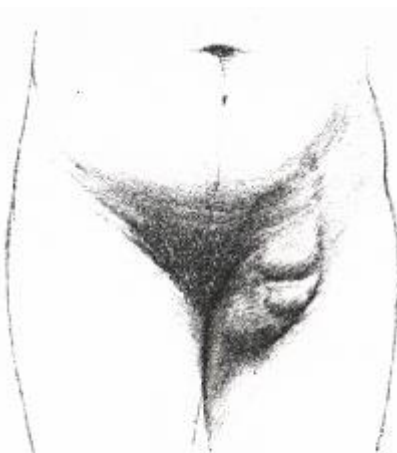


Fig. 23.

Maydl: Podrobná chirurgie. Nauka o kýlách čili herních. 1897

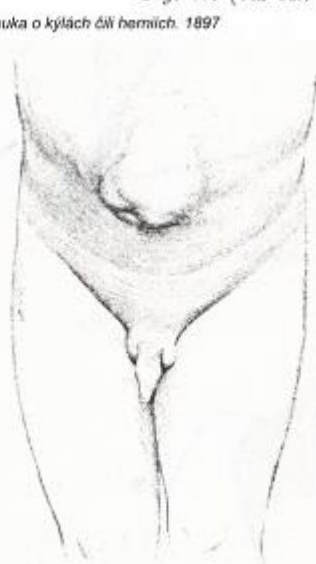


Fig. 28.



Fig. 29.

Maydl: Podrobná chirurgie. Nauka o kýlách čili herních. 1897



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Fig. 31.

Maydl: Podrobná chirurgie. Nauka o kýlách čili herních. 1897

# Other herniae

- **hernia umbilicalis**

- passing through anulus umbilicalis

- **hernia femoralis**

- passing through lacuna vasorum

- linea alba, linea semilunaris, linea arcuata,

- trigonum sternocostale, trigonum lumbocostale

- hiatus oesophageus ("hiatal hernia")

- foramen suprapiriforme, foramen infrapiriforme

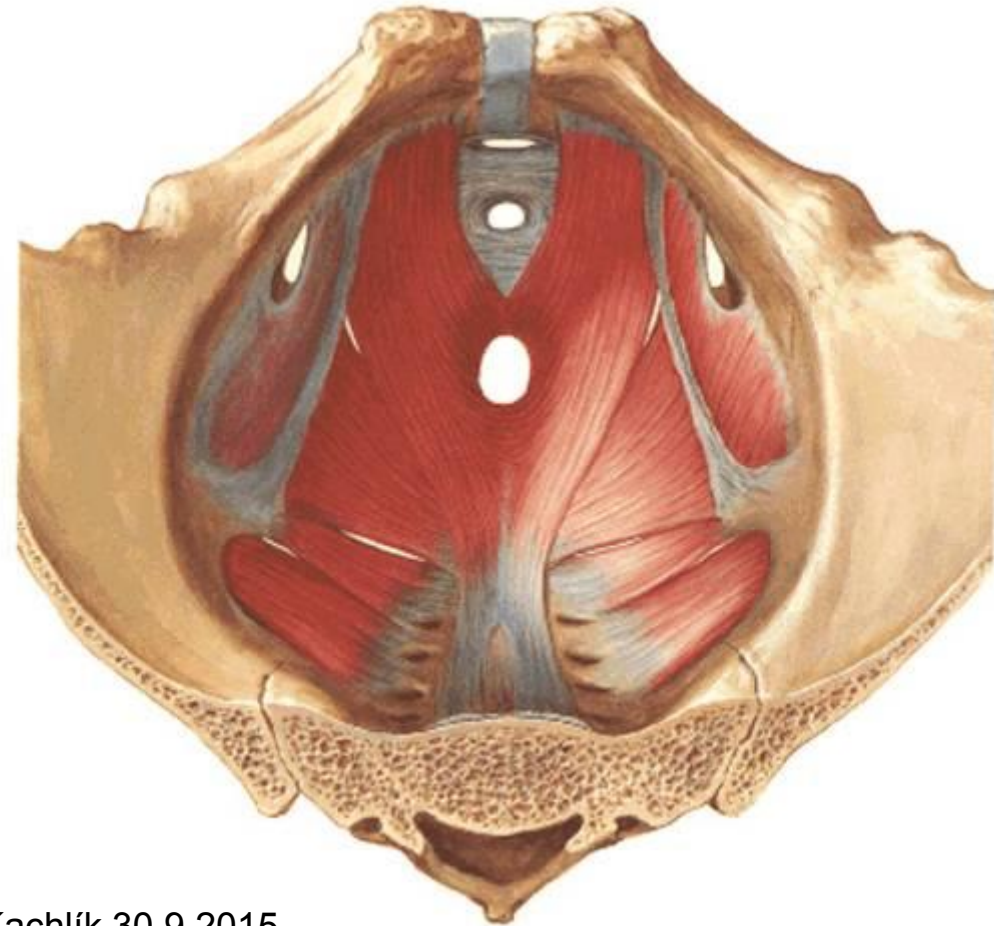
- canalis obturatorius

- trigonum lumbale superius et inferius

# MUSCLES OF PELVIC FLOOR

## Mm. diaphragmatis pelvis

- **M. levator ani**
- **M. ischiooccocygeus**
- **M. sphincter ani externus**



*n. pudendus*

*(anterolateral part of floor)*

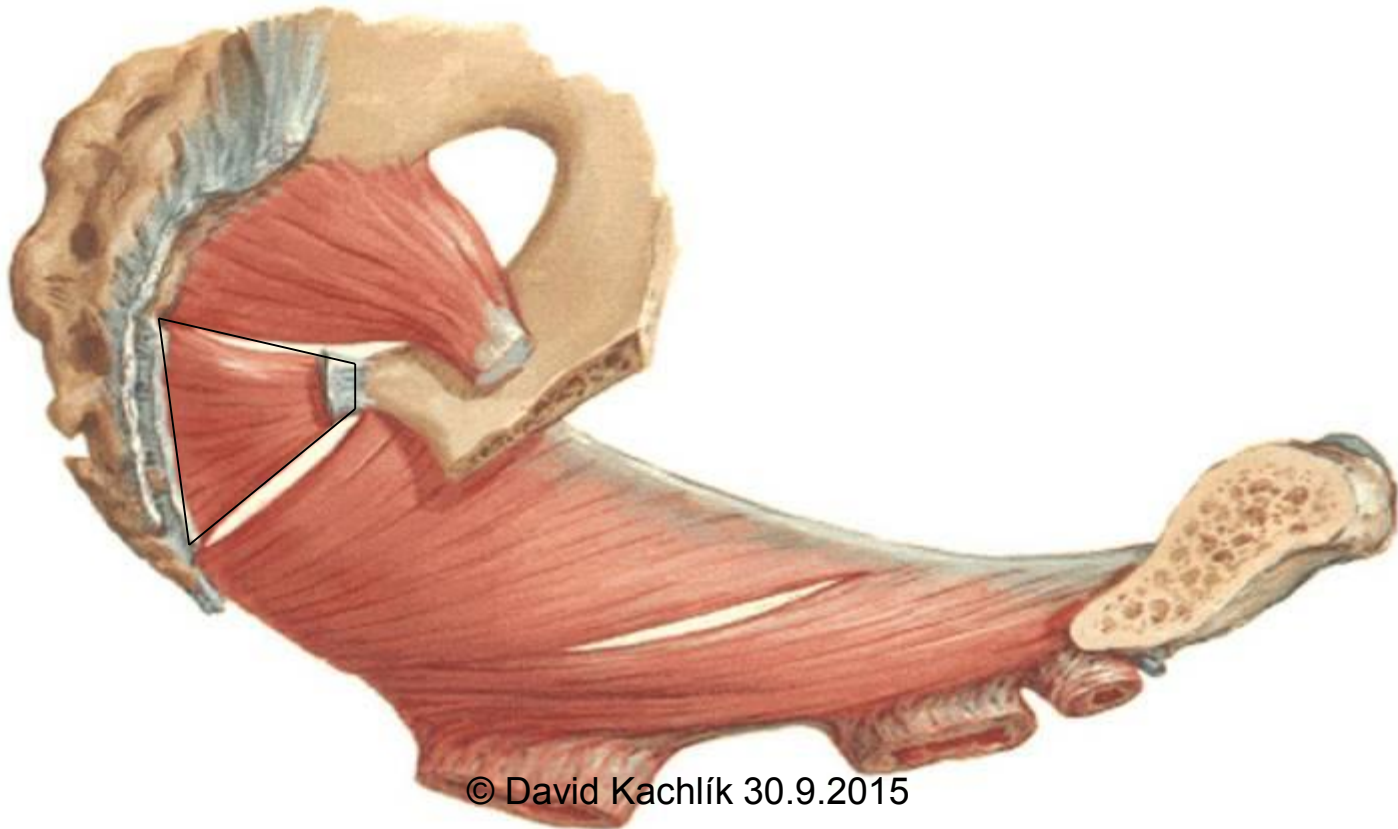
*r. anterior n. sacralis S4*



# MUSCLES OF PELVIC FLOOR

## M. ischiococcygeus (coccygeus)

- parallel and internal to lig. sacrospinale



# MUSCLES C

## M. I

M. ISCHIOCOCCYGEUS

M. SPHINCTER ANI EXTERNUS

Lig. sacrospinale

M. puborectalis

M. iliococcygeus

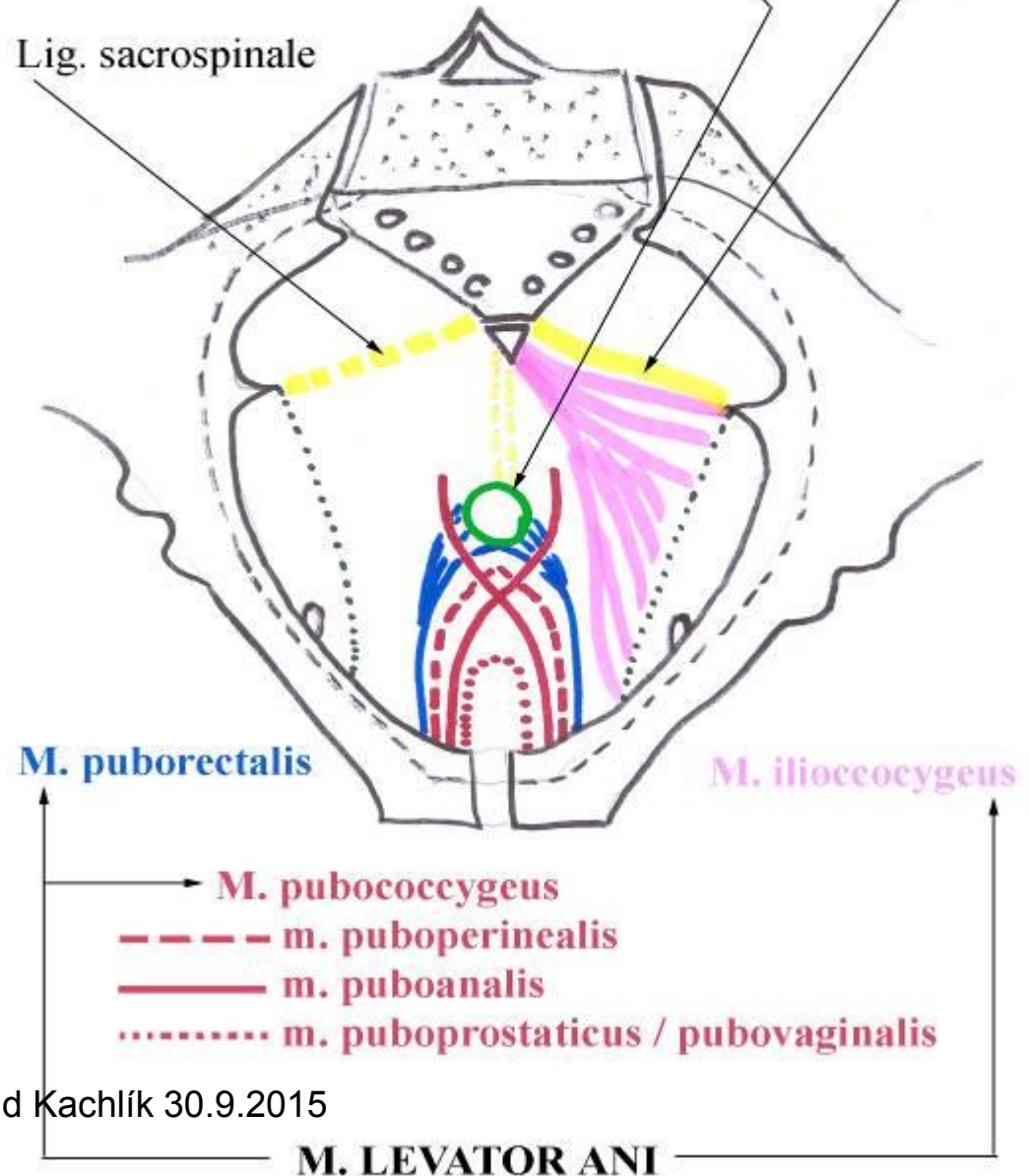
M. pubococcygeus

----- m. puboperinealis

———— m. puboanalis

..... m. puboprostaticus / pubovaginalis

M. LEVATOR ANI

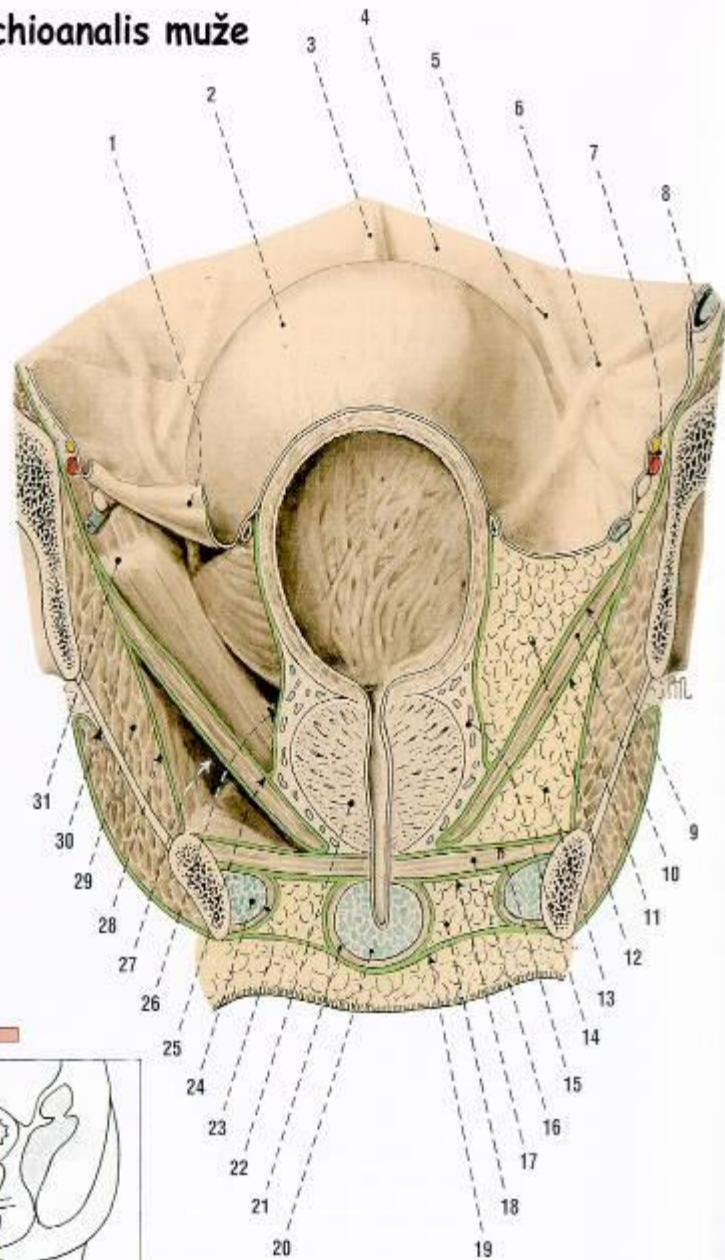


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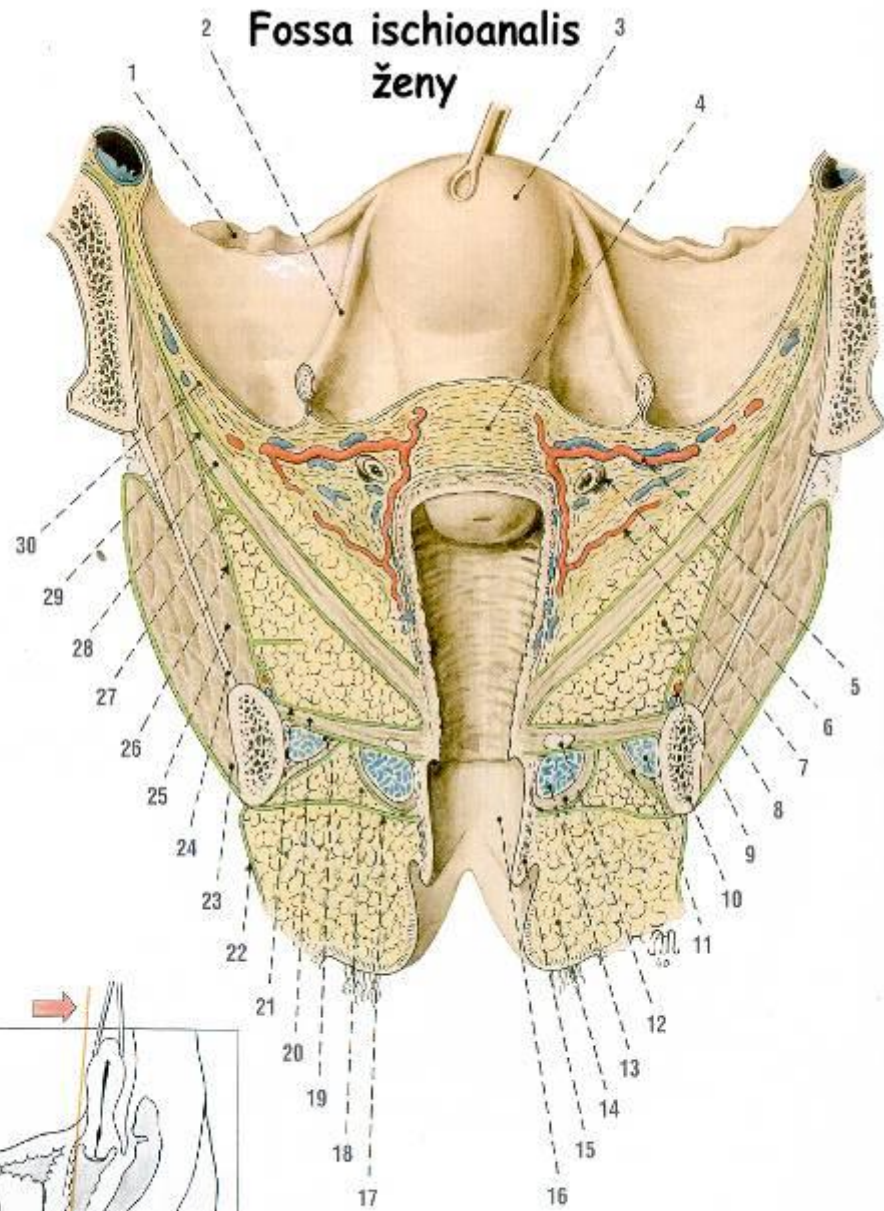
- m. pubococcygeus
  - m. puboperinealis
  - m. puboprostaticus (=m. levator prostatae)
    - in male
  - m. pubovaginalis
    - in female
  - m. puboanalis
- m. puborectalis – caudally below m. pubococcygeus
- m. iliococcygeus – originates from arcus tendineus m. levatoris ani



# Fossa ischioanalis muže



# Fossa ischioanalis ženy



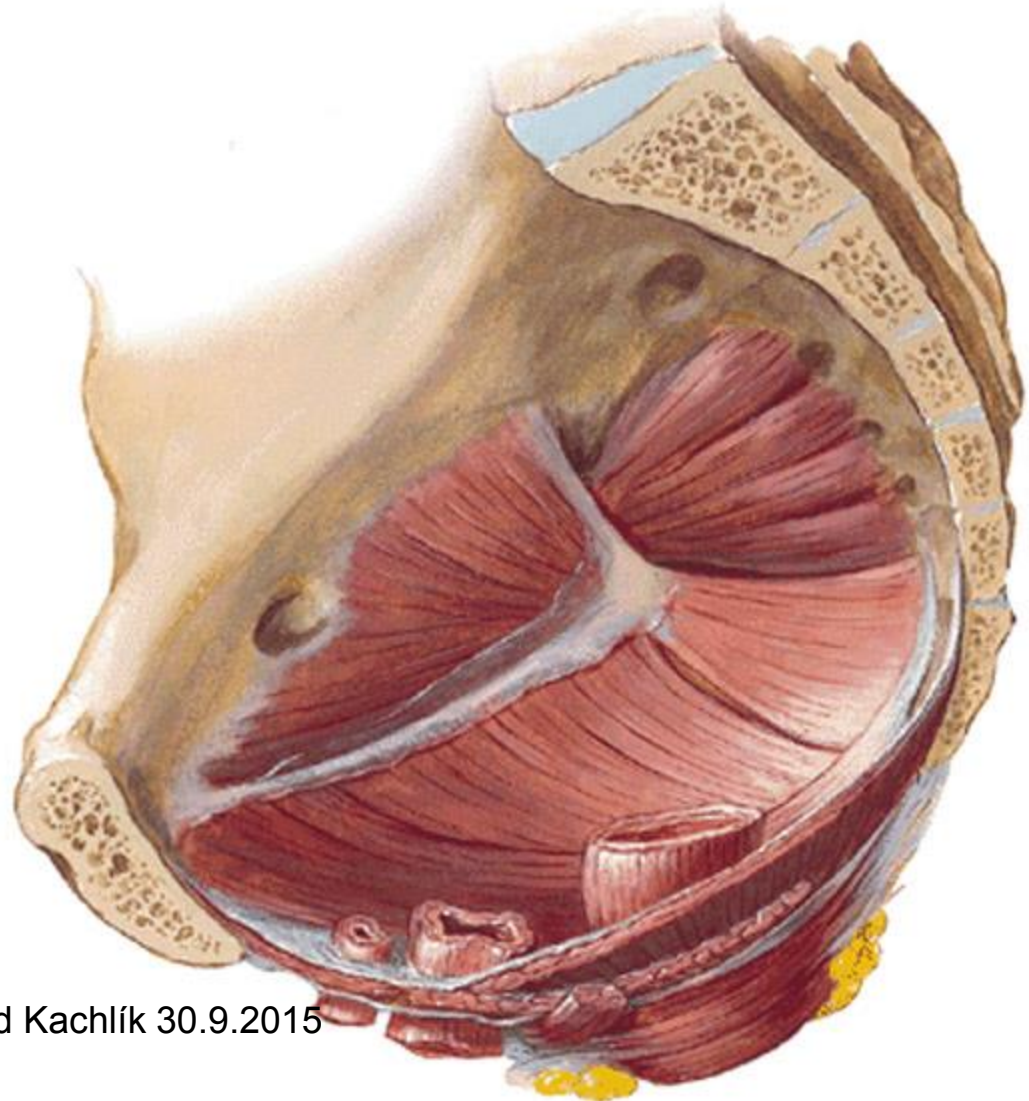


# MUSCLES OF PELVIC FLOOR

## M. sphincter ani externus

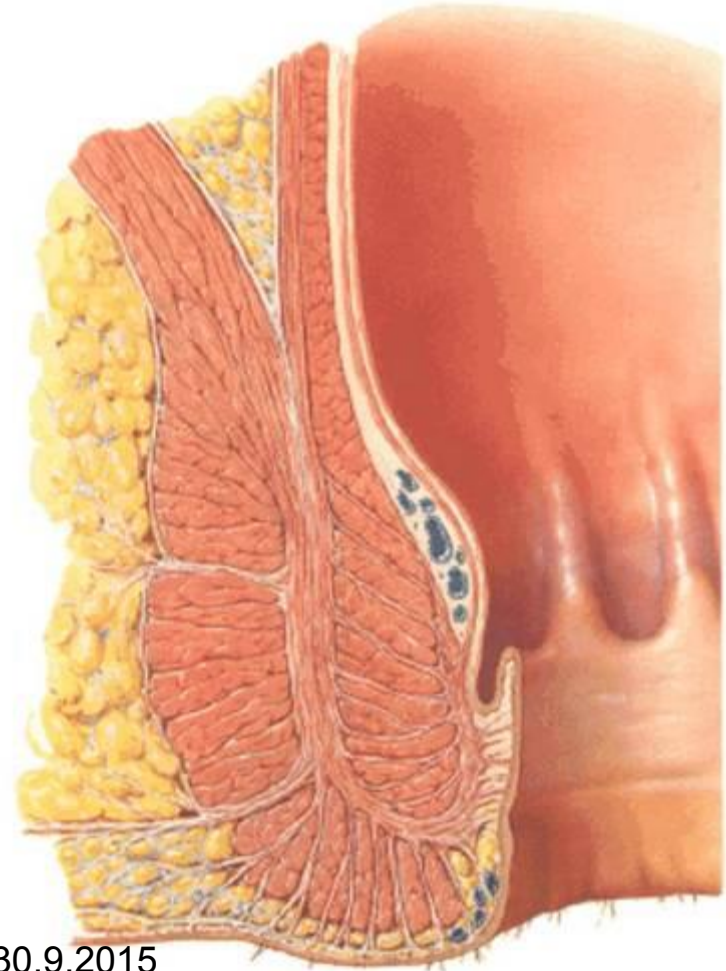
- pars subcutanea
- pars superficialis
- pars profunda

*encircles anus*



# MUSCLES OF PELVIC FLOOR

## M. sphincter ani externus



# Function of pelvic floor muscles

- maintain to compress organs
- contribute to continence
- abdominal pressure
- inspiration muscles
- close anus (m. sphincter ani externus + m. puborectalis)

*incontinence, prolapsus*



# Pelvic floor prolapse

