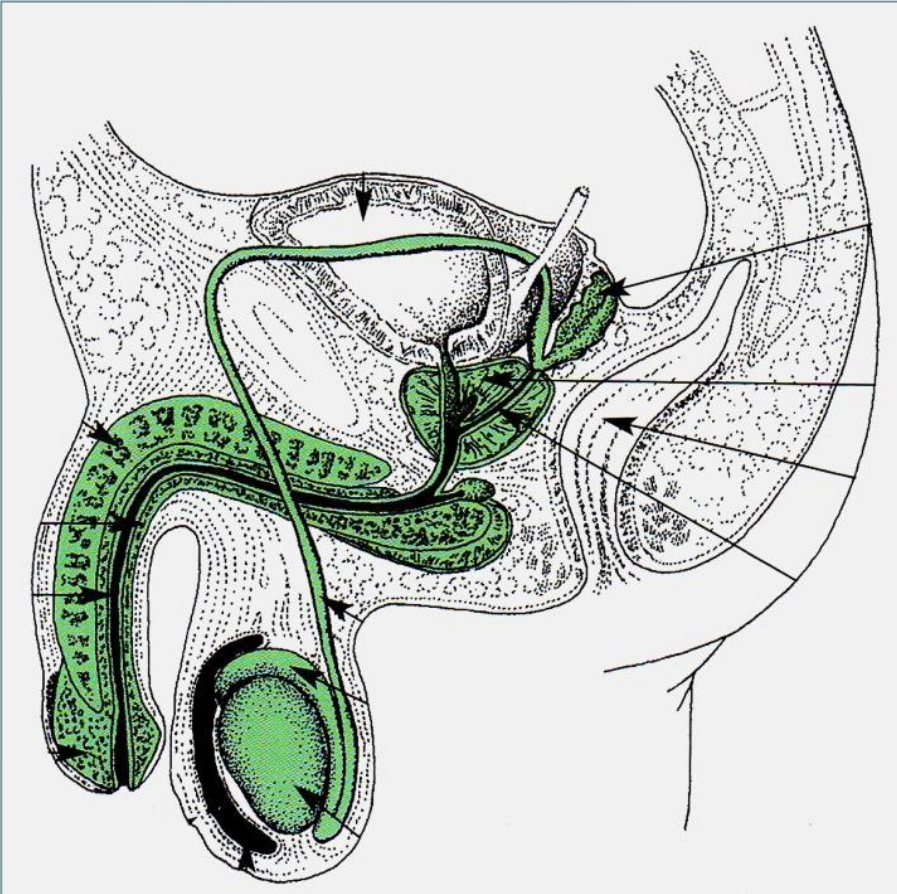


Morphology and histology of the epididymis, spermatic cord and the seminal vesicle and prostate



Dr. Dávid Lendvai
Anatomy, Histology and Embryology Institute
2019.

Male genitals



1. Testicles
2. Seminal tract:
 - epididymis
 - deferent duct
 - ejaculatory duct
3. Additional glands
 - Seminal vesicle
 - Prostate
 - Cowpers glands
4. Penis

Embryological background

The male reproductive system develops at the junction between the urethra and vas deferens. The vas deferens is derived from the mesonephric duct (Wolffian duct), a structure that develops from mesoderm.

- epididymis
- Deferent duct
- Paradidymis (organ of Giralvés)

Wolffian duct drains into the **urogenital sinus**:

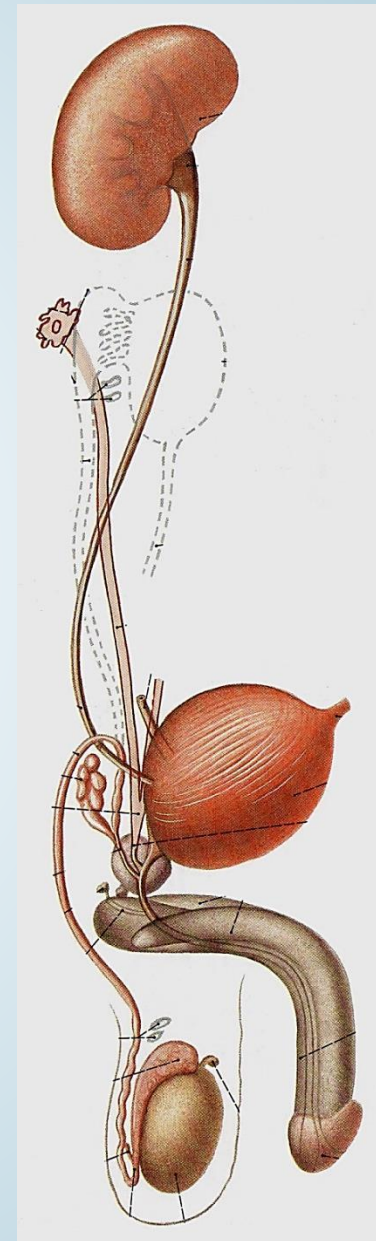
From the sinus develops:

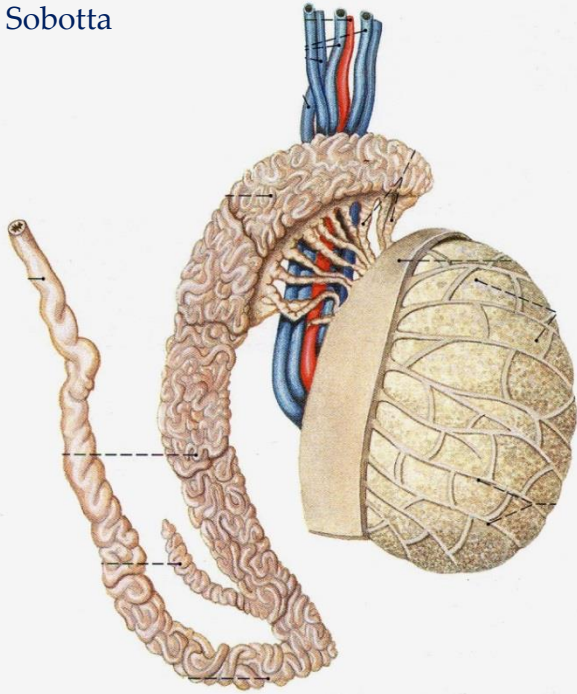
- Prostate and
- Seminal vesicle

Remnant of the **Müllerian duct**:

- Appendix testis (female: Morgagnian Hydatids)
- Prostatic utricle (male vagina)

Descensus testis



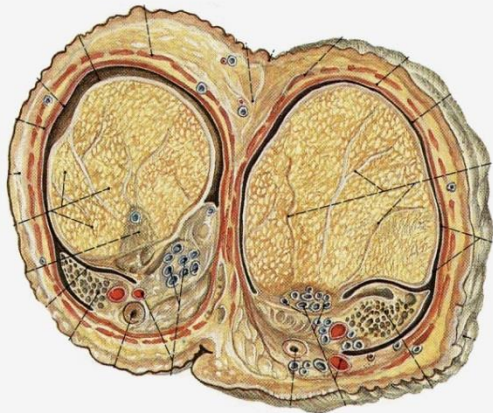


Epididymis

4-5 cm long

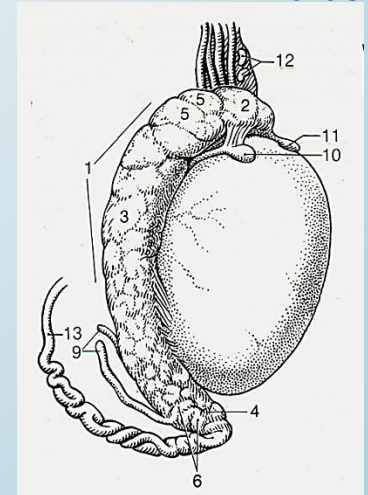
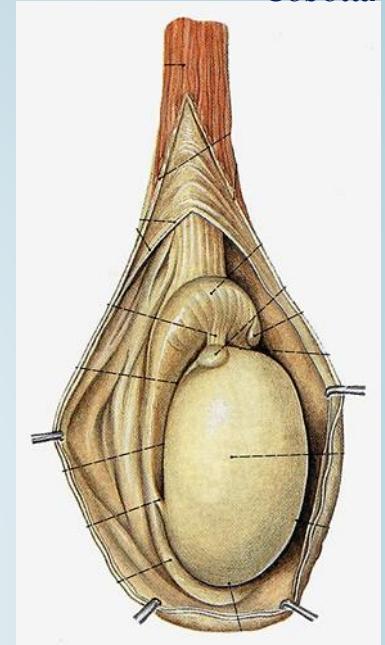
At the posterior surface of the testis

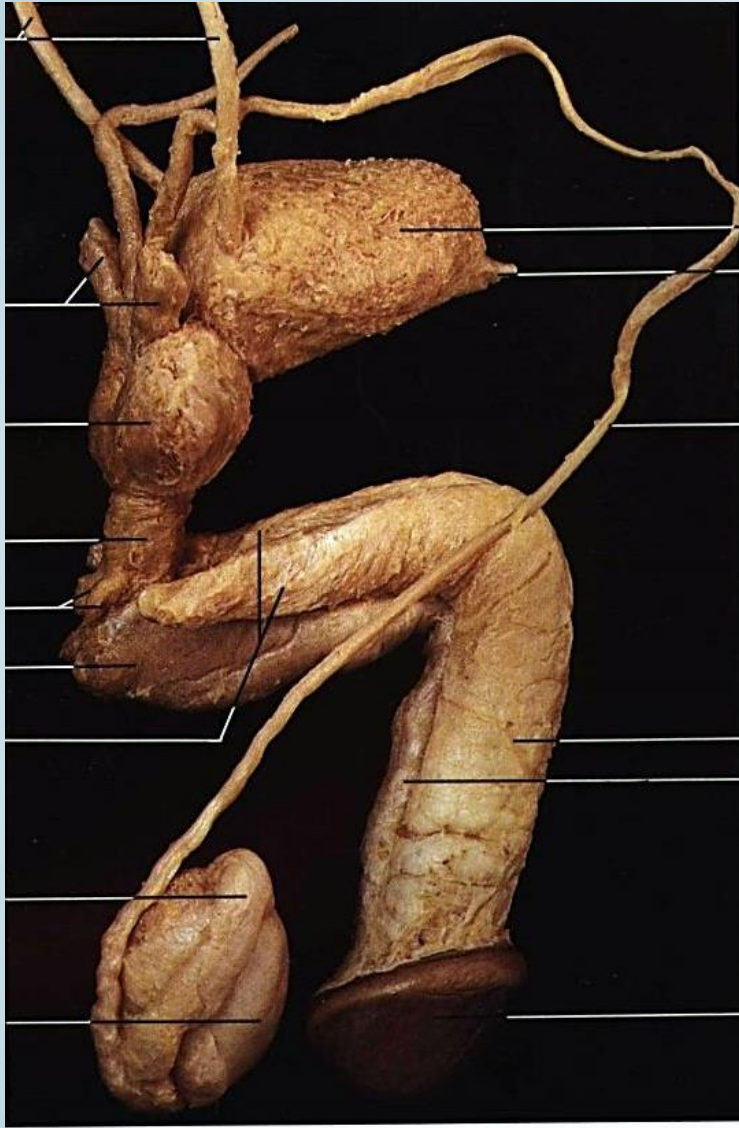
- Head of epididymidis
- Body of epididymidis
- Tail of epididymidis
- superior & inferior epididymidis lig.
- Appendix epididymidis
- Paradidymis



Tunica vaginalis testis

Sinus of epididymidis

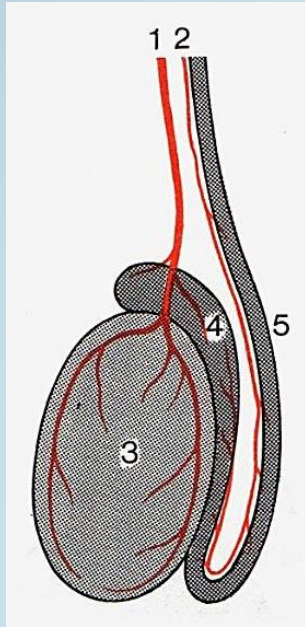




Yokochi



Faller

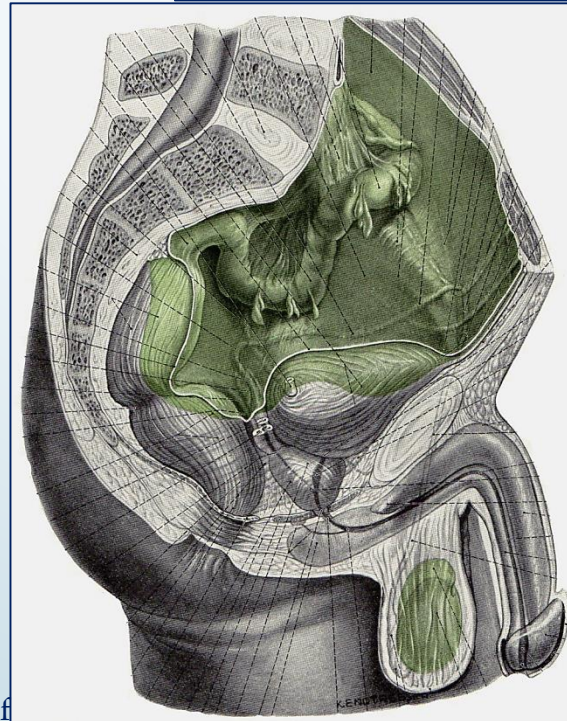
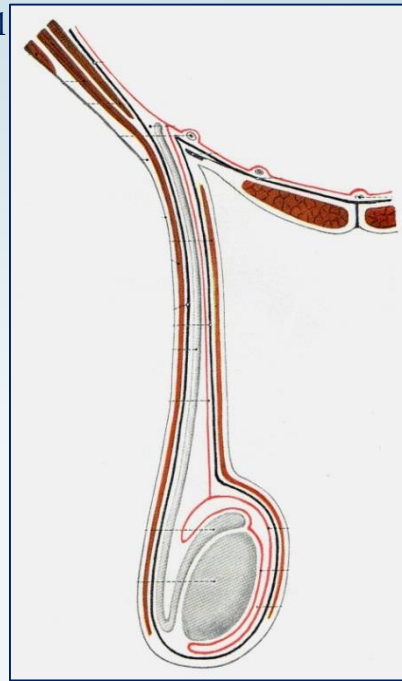


Testicularis a.
(from the abdominal aorta)

Artery of the deferent duct
(from the umbilical a.)

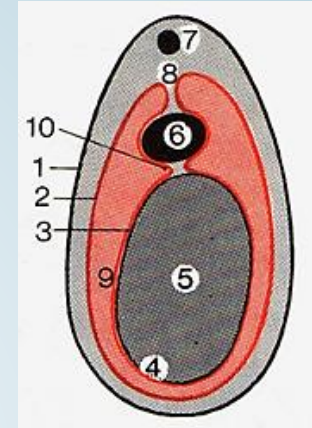
Pampiniform plexus

Hafferl



Pernkopf

Faller



2. parietal lamina of the
testis (Tunica vaginalis)

3. visceral lamina of the
testis (Tunica vaginalis)

8. Mesorchium

9. Cavum serosum

10. Sinus of the
epididymidis

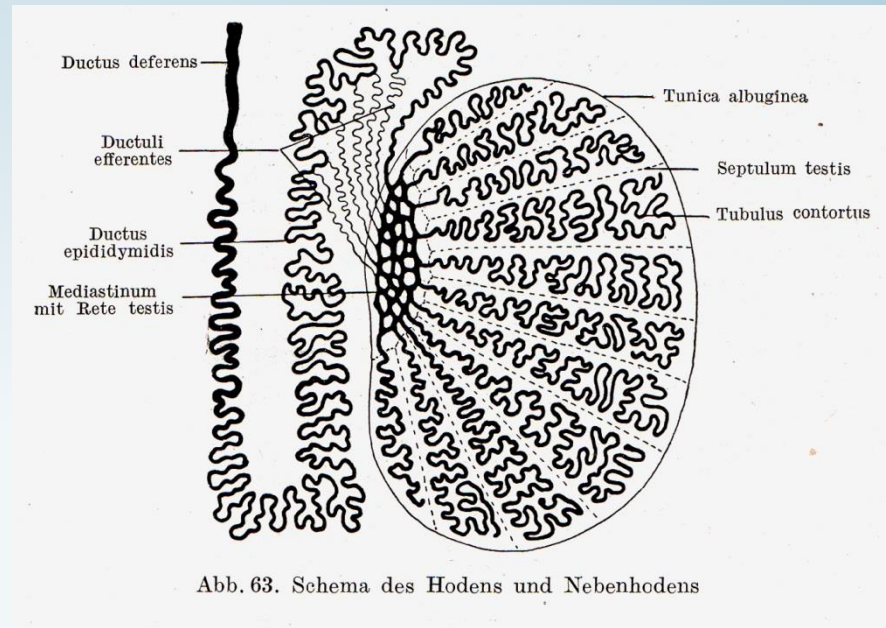
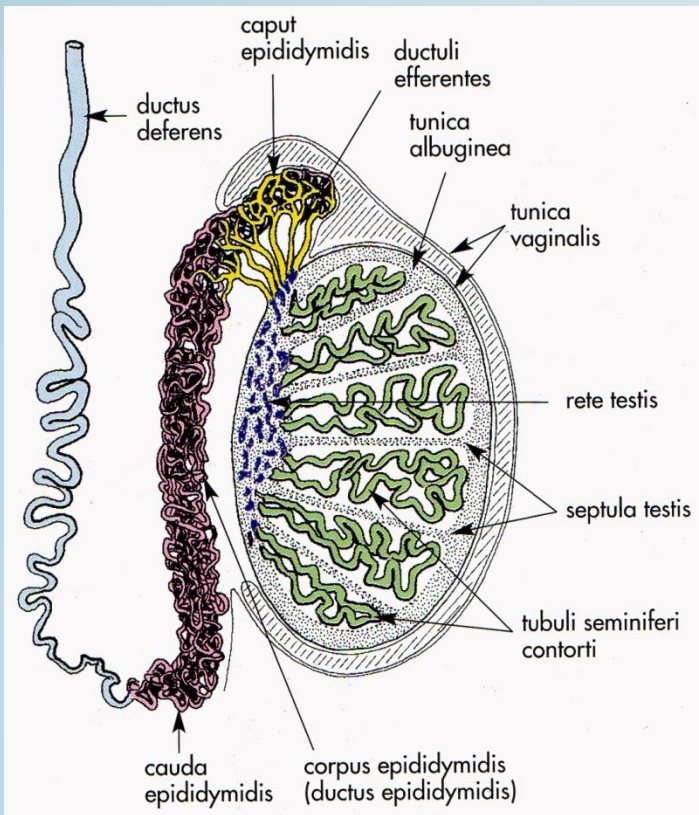


Abb. 63. Schema des Hodens und Nebenhodens

head: ca. 10 – 20 lobules (Lobulus epididymidis)

Each lobule has one efferent duct of testis (resorpton ca. 90% of the liquid)

The efferent ducts draining into the epididymal duct: the ducts of epididymis are about 5 - 6 m long and strongly wound up (release of acidic substances "acid starvation" and ripening agents)

Tail: Seed storage and transition into the vas deferens

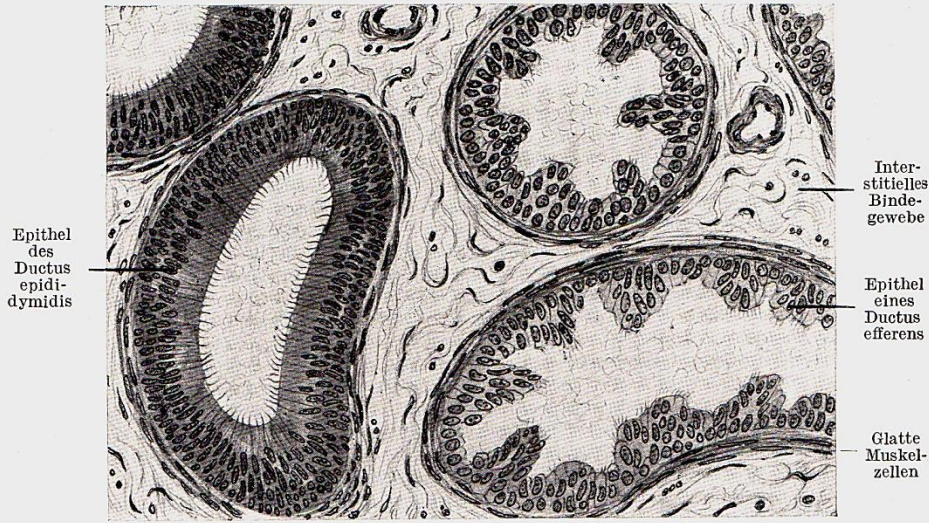
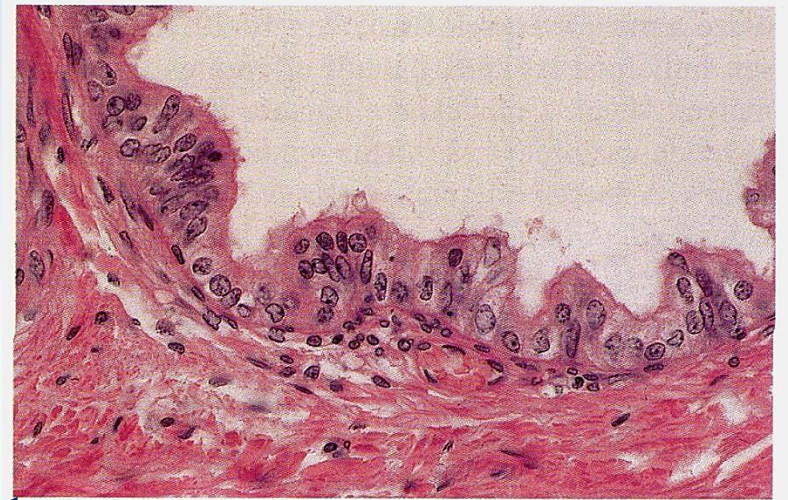


Abb. 65. Nebenhode, Mensch (Präparat)



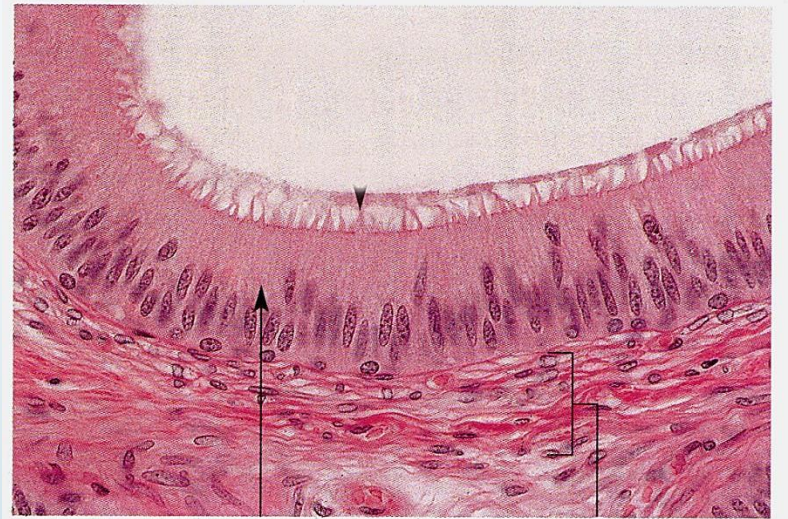
Efferent ducts:

Irregular epithel:

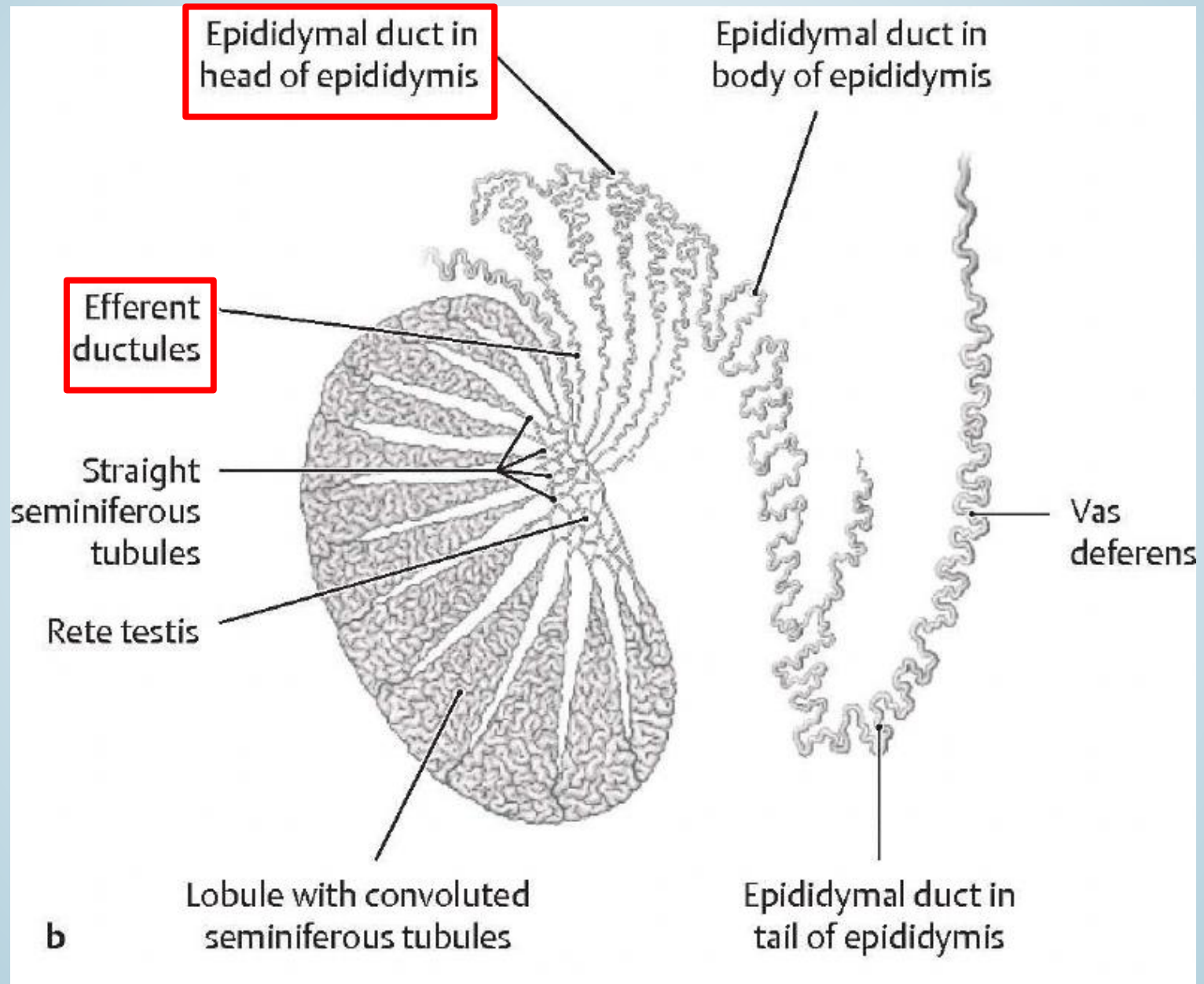
Simple cuboidal and columnar with *microvilli* (Sekretion - Resorption) or pseudostratified columnar with *kinocilia*

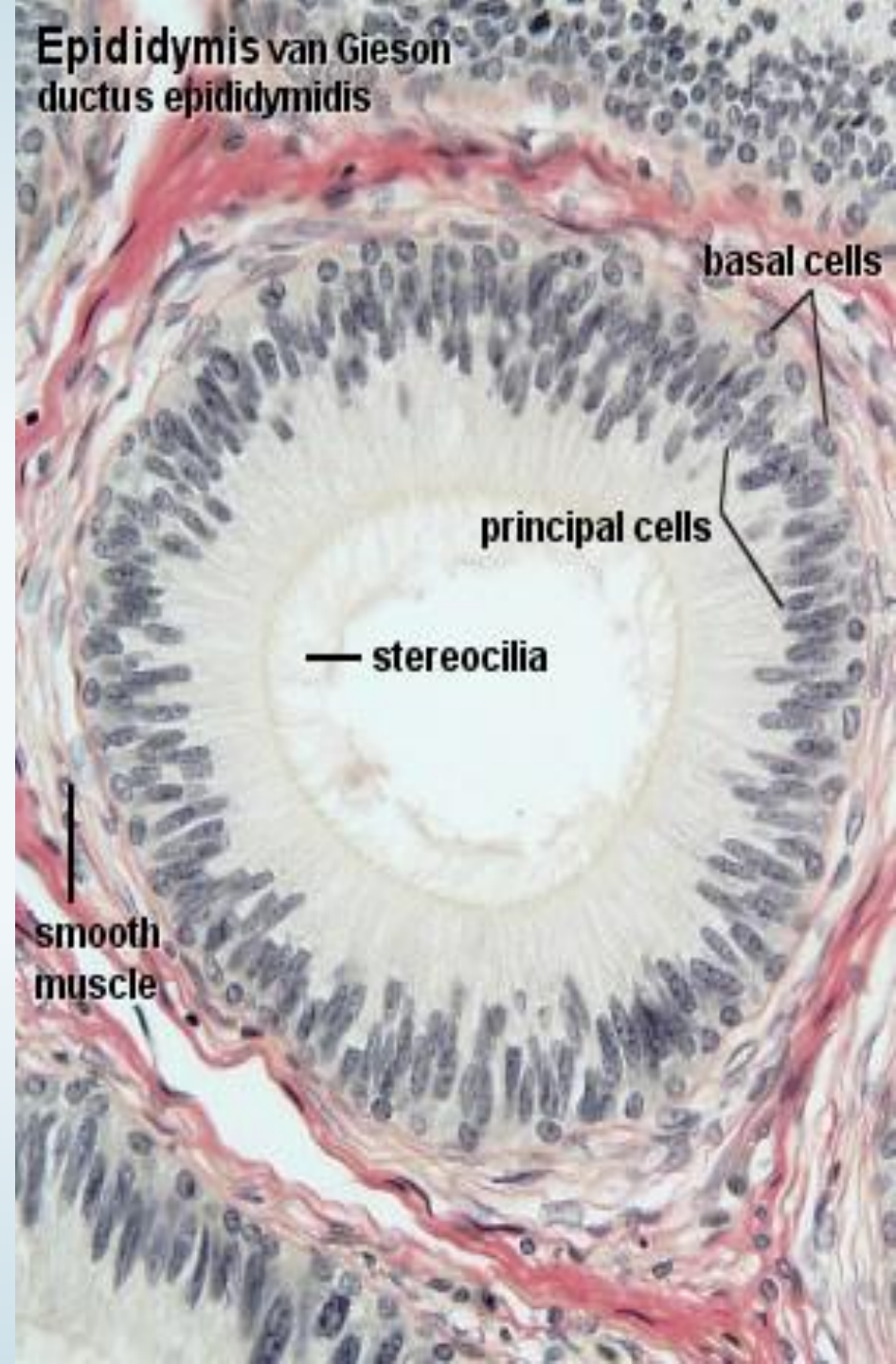
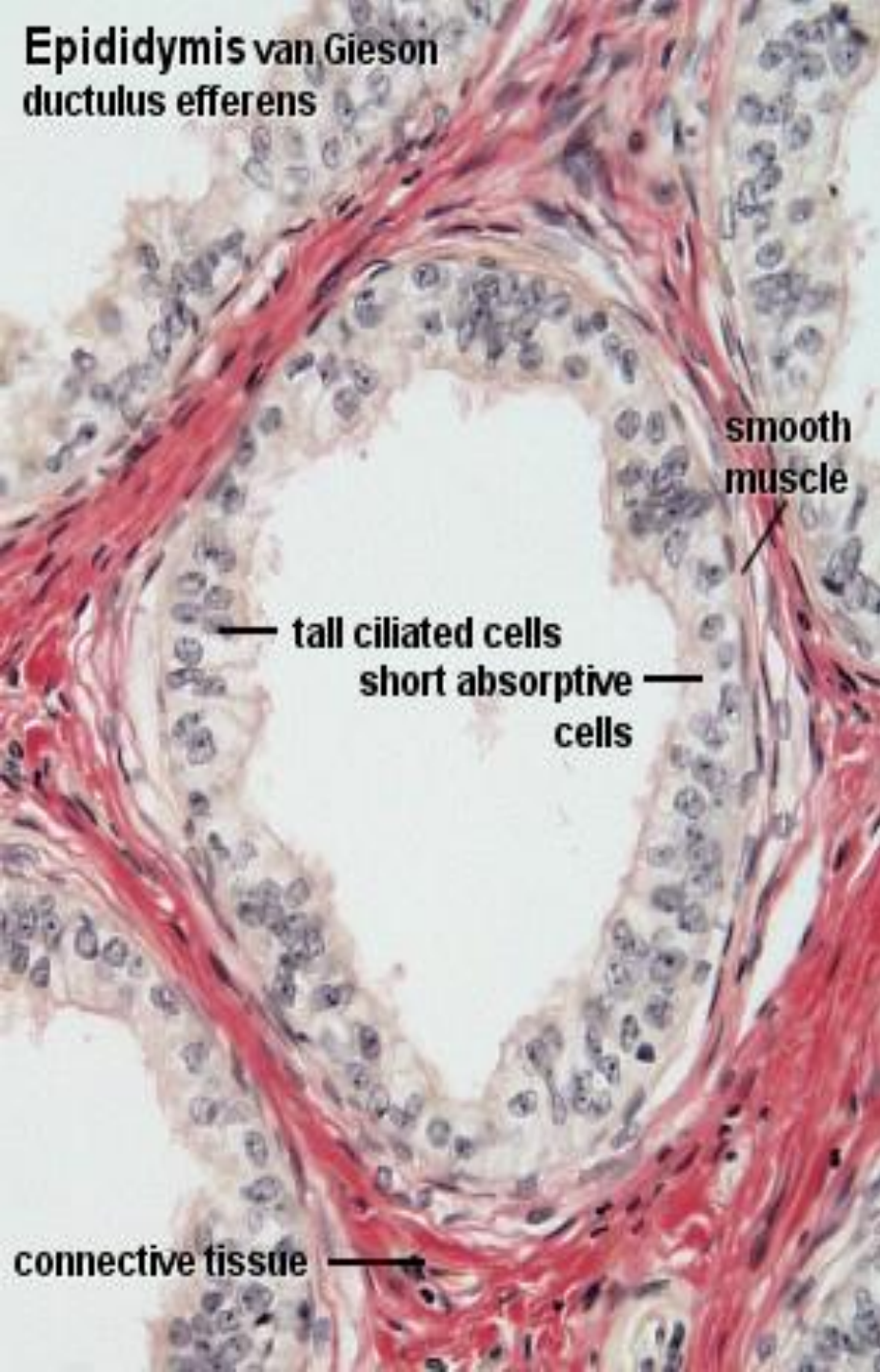
Ductus epididymidis:

Pseudostratified columnar with *stereocilia* (chiefcells and basalcells)



HISTOLOGY OF THE EPIDIDYMIS

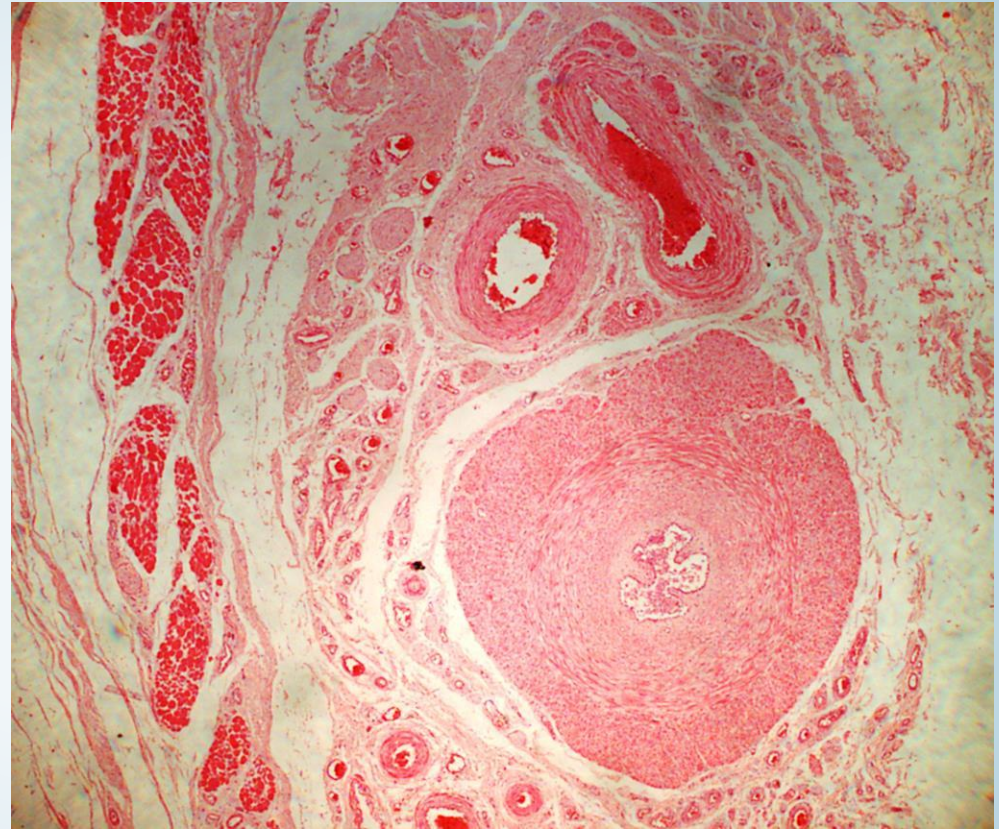




Ductus deferens / Vas deferens



Yokochi

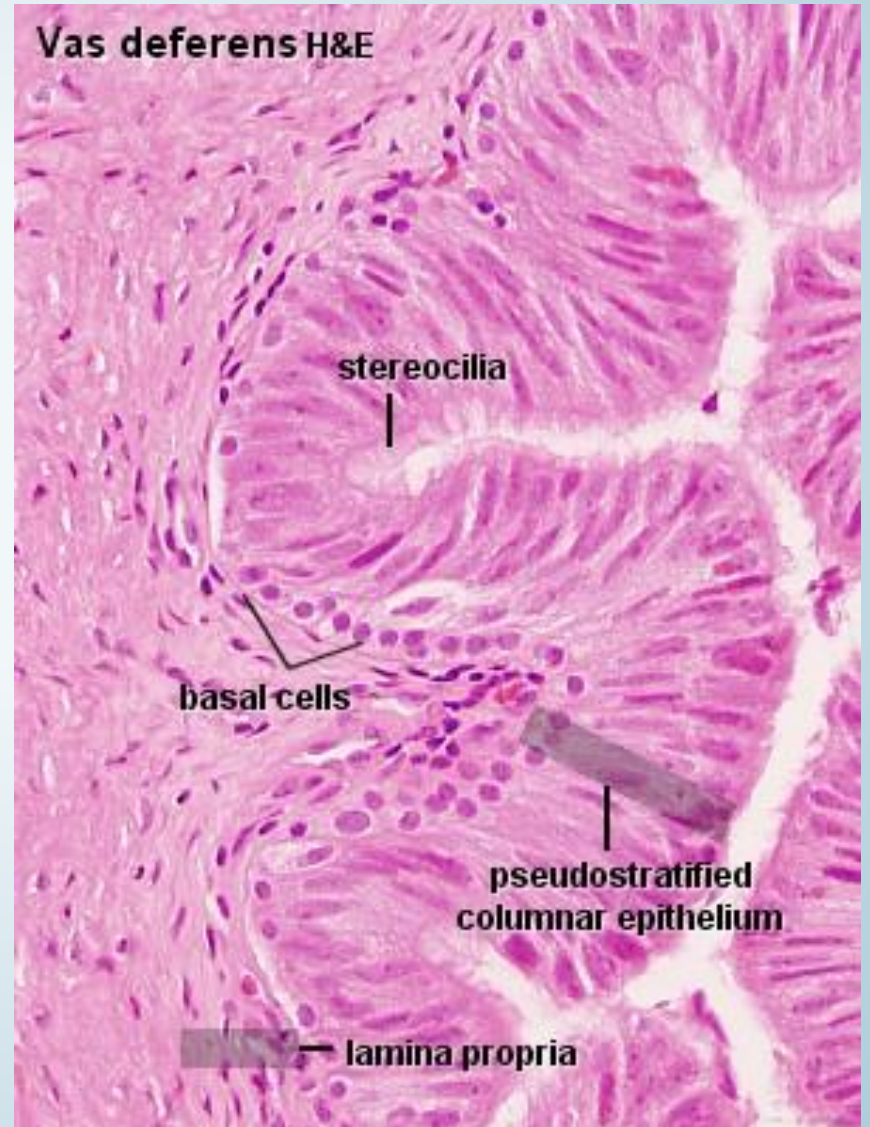
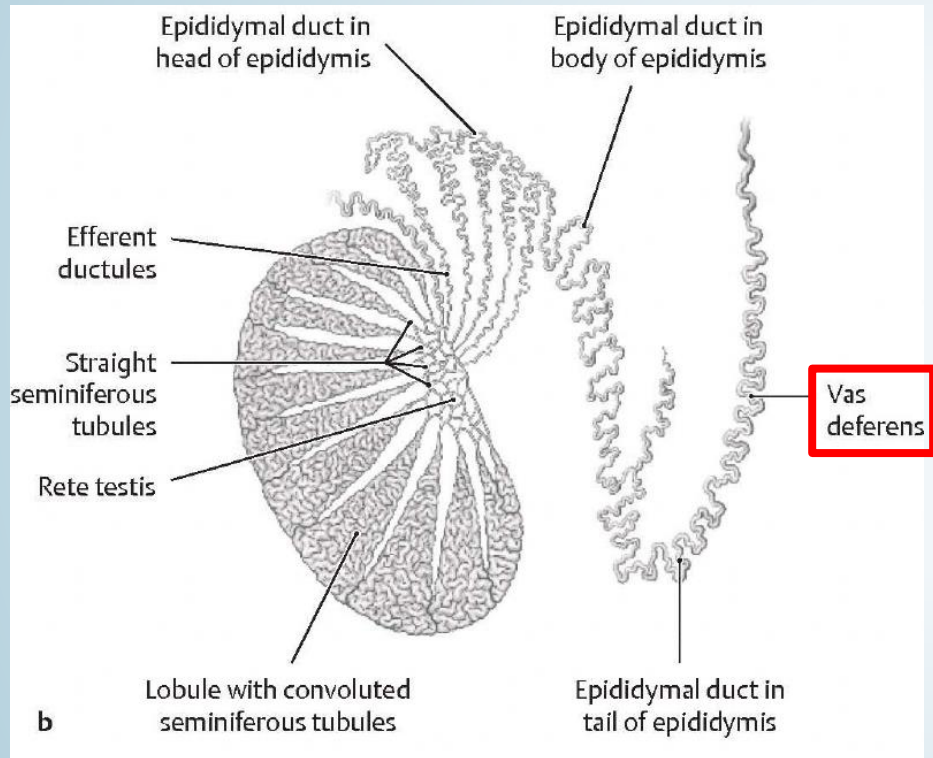


ca. 30 cm long (+ 30 cm spiral part)

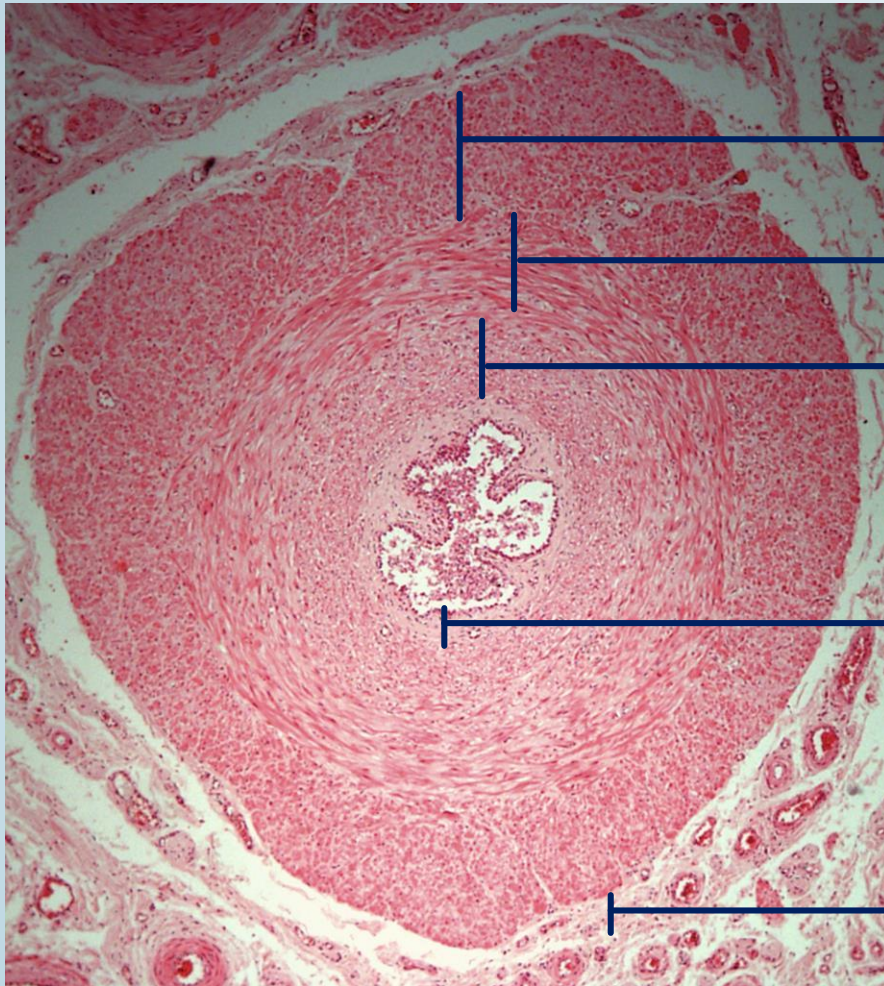
2,5-3 mm thick

hard, in the scrotum palpable tube

HISTOLOGY OF THE VAS DEFERENS



3 layers:



Tunica muscularis:

→ Stratum longitudinale ext.

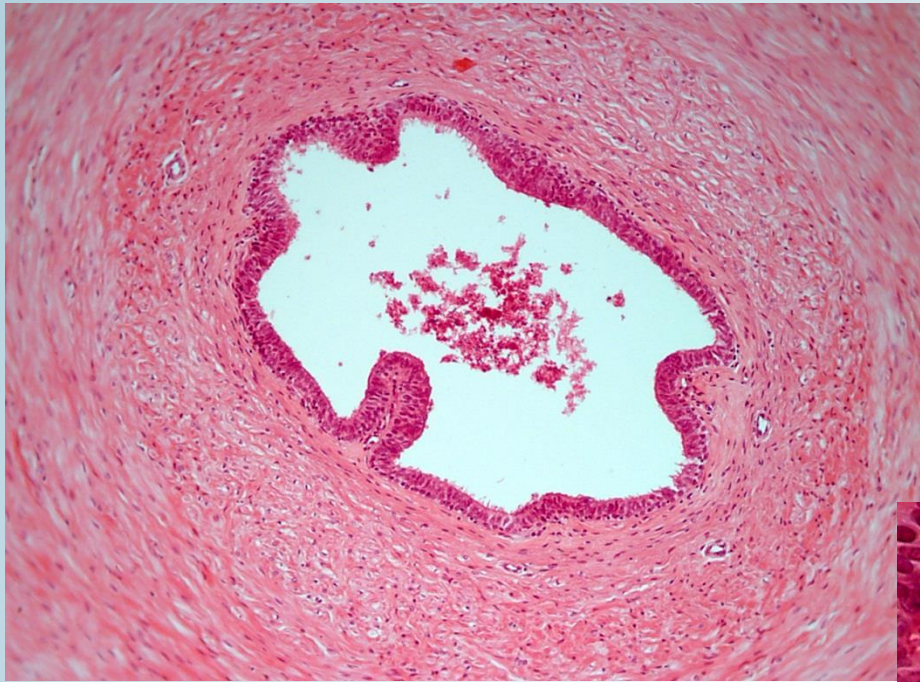
→ Stratum circulare

→ Stratum longitudinale int.

Tunica mucosa:

- Lamina epithelialis
- Lamina propria

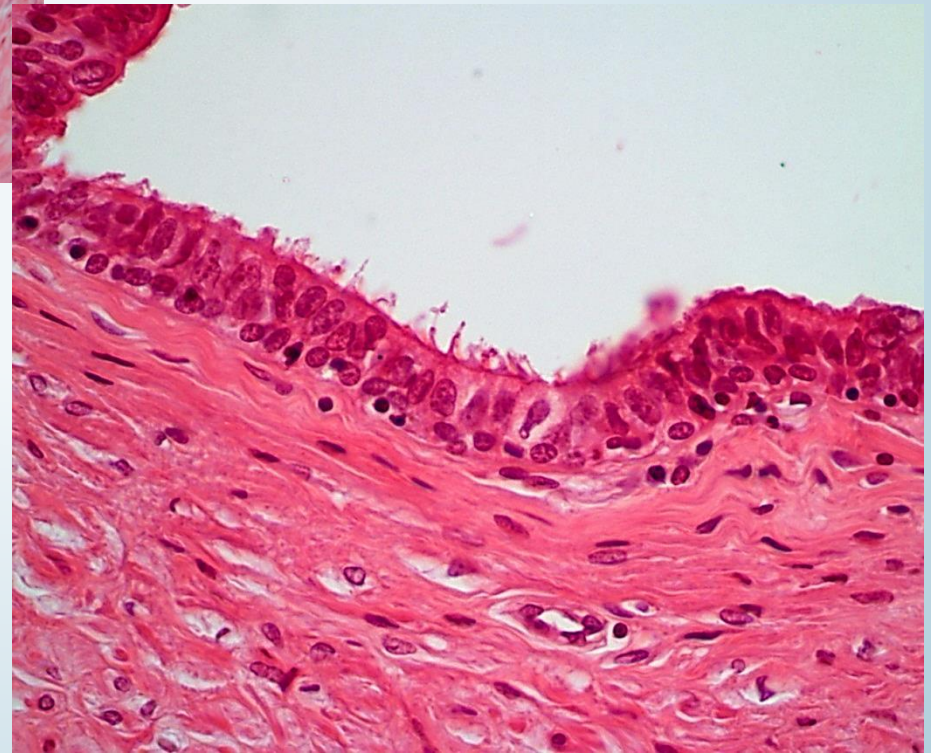
→ Tunica adventitia

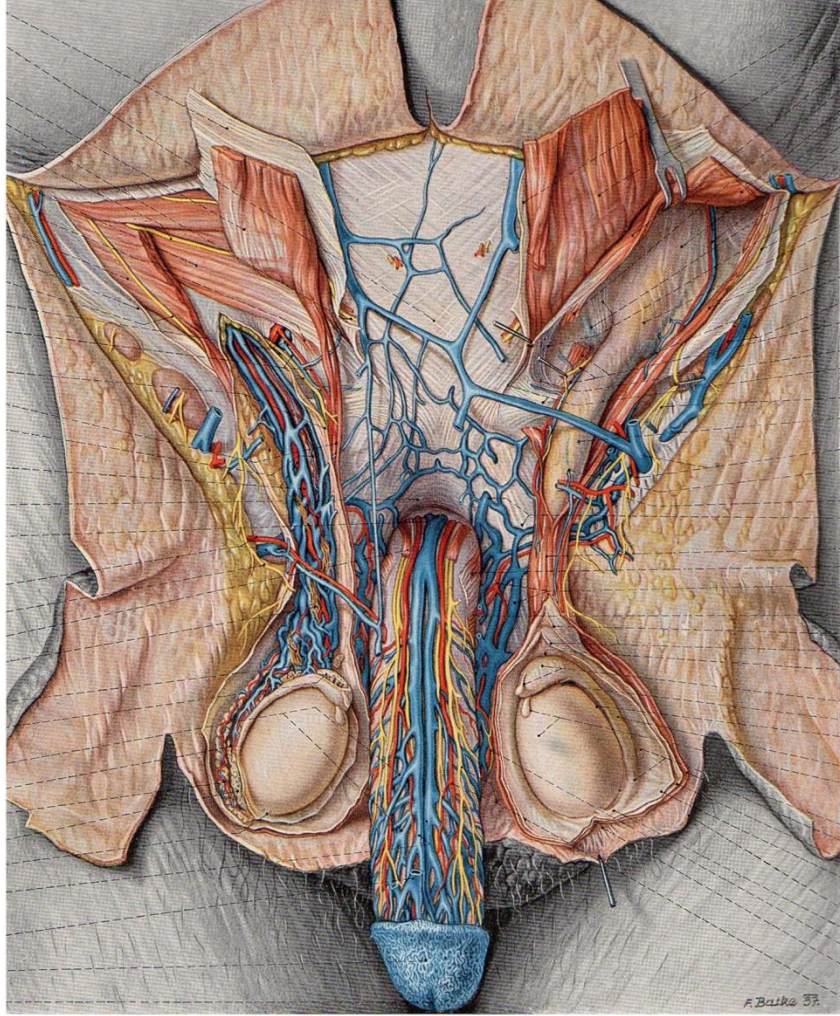


- Epithelium lower than in ductus epididymidis
- Stereocilia only in the initial part
- many basal cells

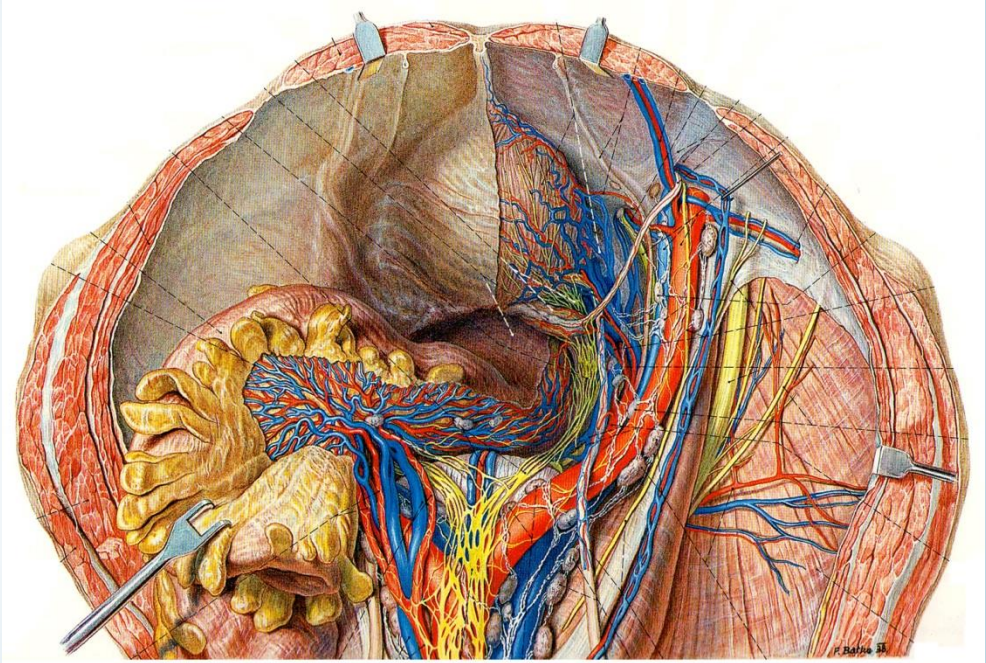
Lamina propria:

- elastic and
- collagen fibers

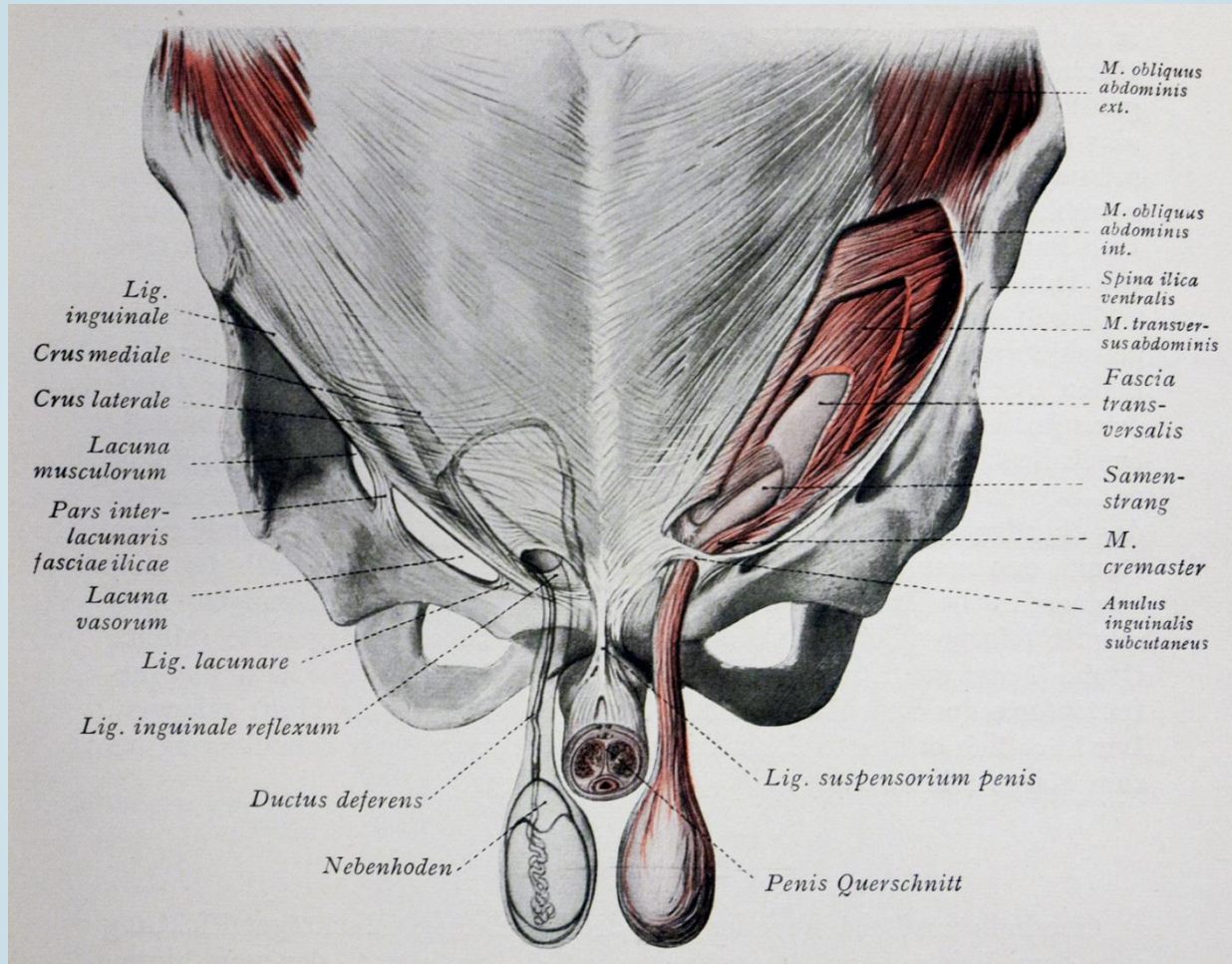




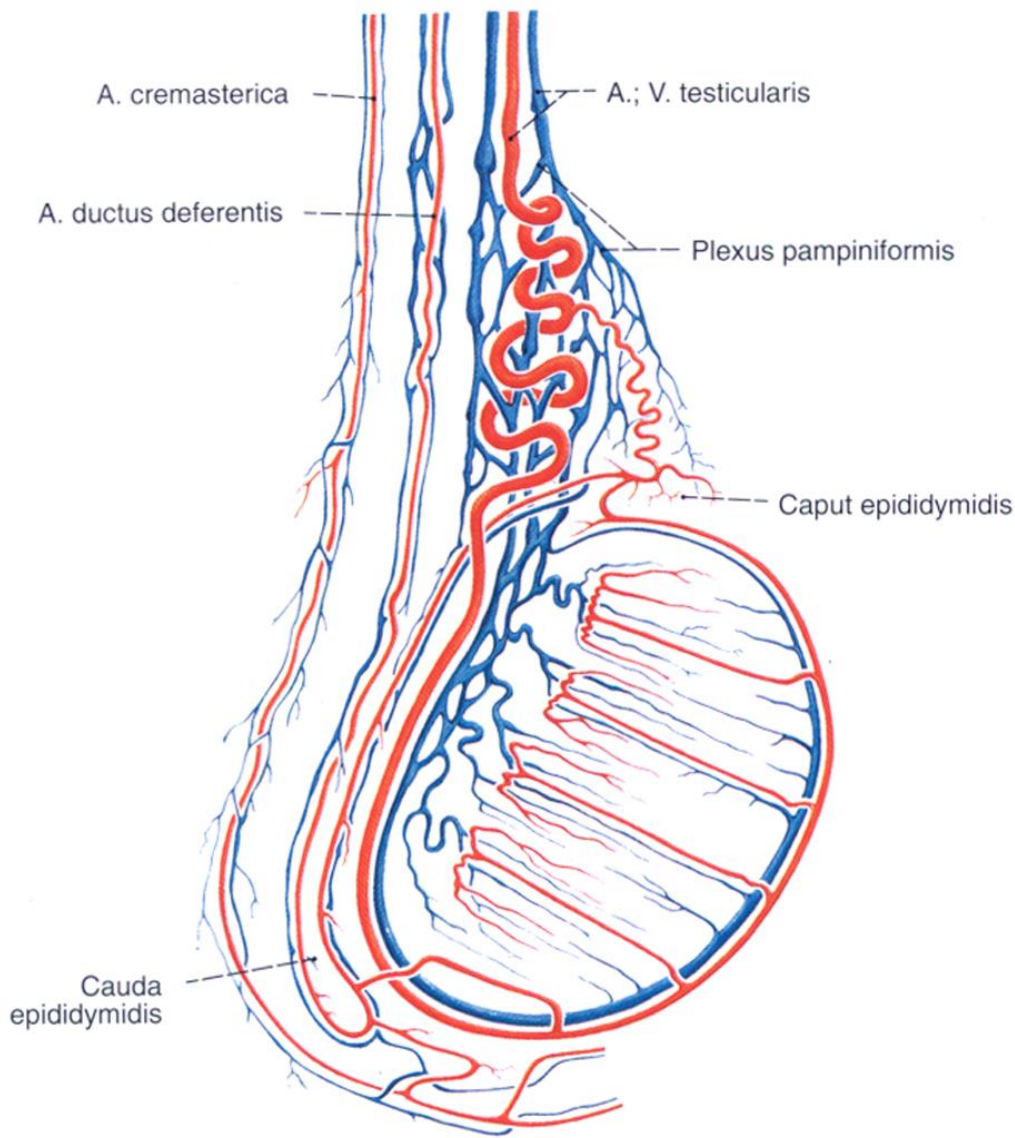
Pernkopf



Pernkopf



BLOOD SUPPLY



Testicular a.:

From the Aorta (L1-2)

Anastomosis with:

Vas deferens a.

Cremasteric a.

Inf. Epigastric a.

Veins:

Pampiniform plexus → Testicular v.

left: Renal v.

right: inf. V. cava

Lymphatic vessels:

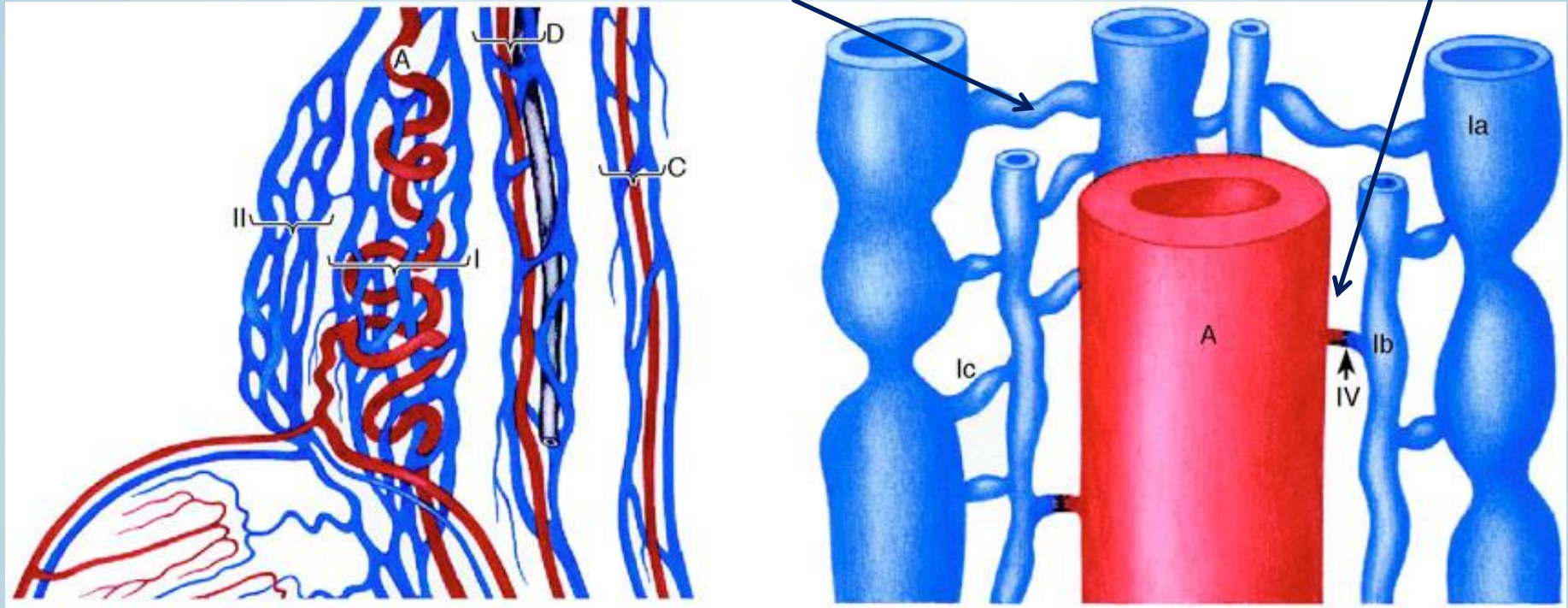
testis: lumbal lymph nodes

scrotum, coats: inguinal lymph nodes

TESTICULAR CIRCULATION

Anastomosis between veins

Arteriovenous anastomosis



Venous plexuses around the:

- Testicular a.
- Vas deferens a.
- Cremasteric a.

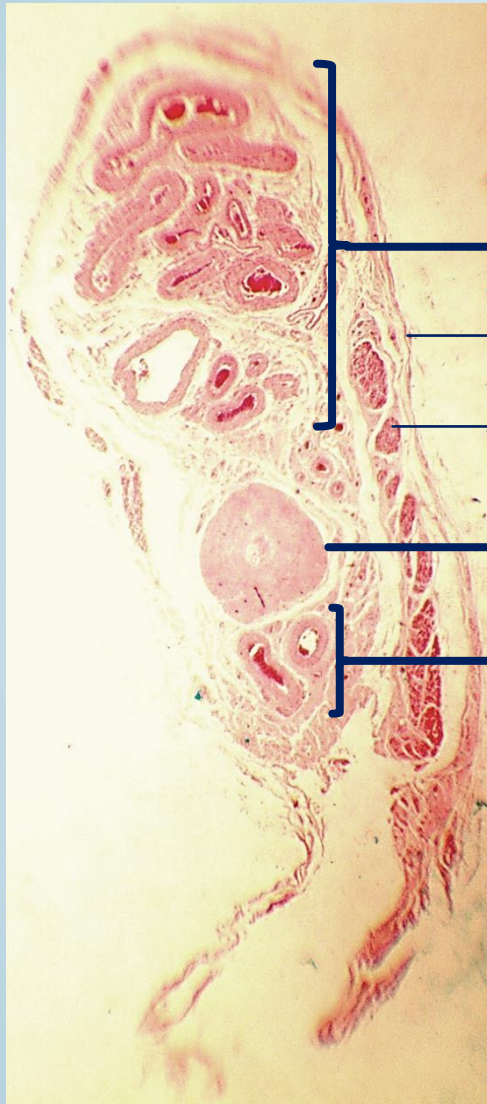
Independent venous plexuses

Muscular veins! → constrictions, regulation of circulation

Arteriovenous anastomosis:

Testosterone-rich blood enters the testicles back → Higher testosterone levels in testicular artery as peripheral, testicular testosterone cycle near

Spermatic cord



→ Gonadal vessels: testicular a., pampiniform plexus

→ Cremasteric fascia

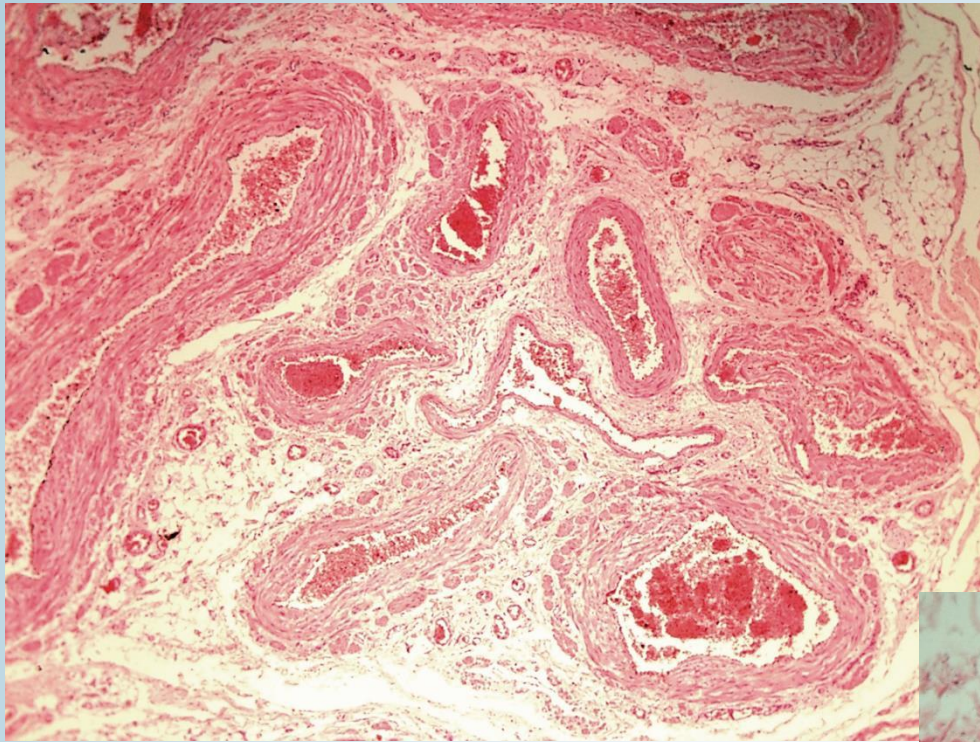
→ Cremaster m.

→ Ductus deferens / vas deferens

→ Deferens A. and V.

...and numerous peripheral nerve cross sections:

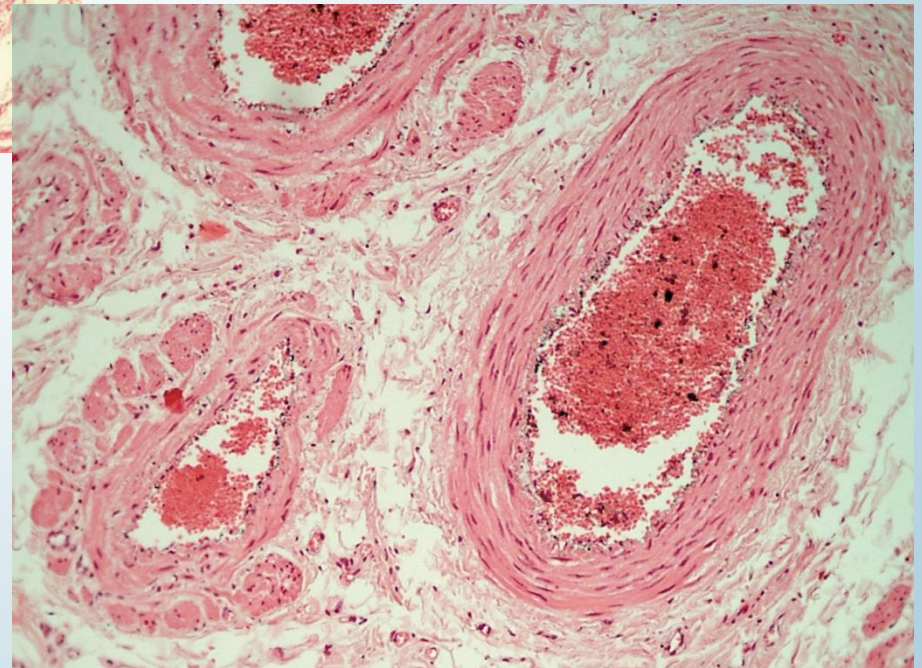
- Genital ramus of the genitofemoral n.
- Ilioinguinal n.
- Spermatic plexus (autonomic sympathetic)



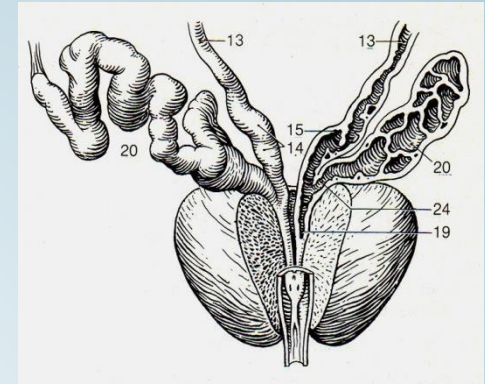
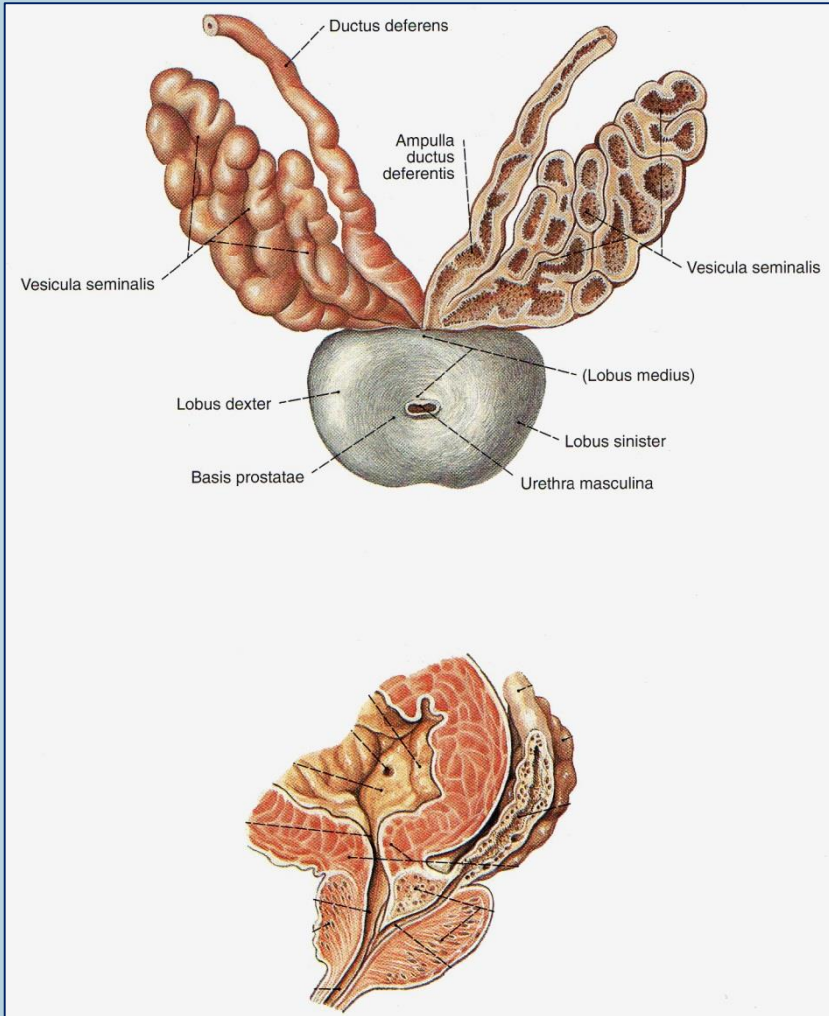
Pampiniform plexus:
10 – 12 muscular veins

(in the adventitia longitudinal
smooth muscle cell bundles)

Testicular a.: from the abdominal aorta
(at level L2)
muscular artery
distally ramifies (several transverse
sections)



Vesicula seminalis / Glandula vesiculosa



ca. 4-5 cm long
ca. 1,5-2,5 cm wide

a single wound duct (ca. 15 cm)

at the base of the bladder and to the base
prostate attached with fascia

Excretory duct

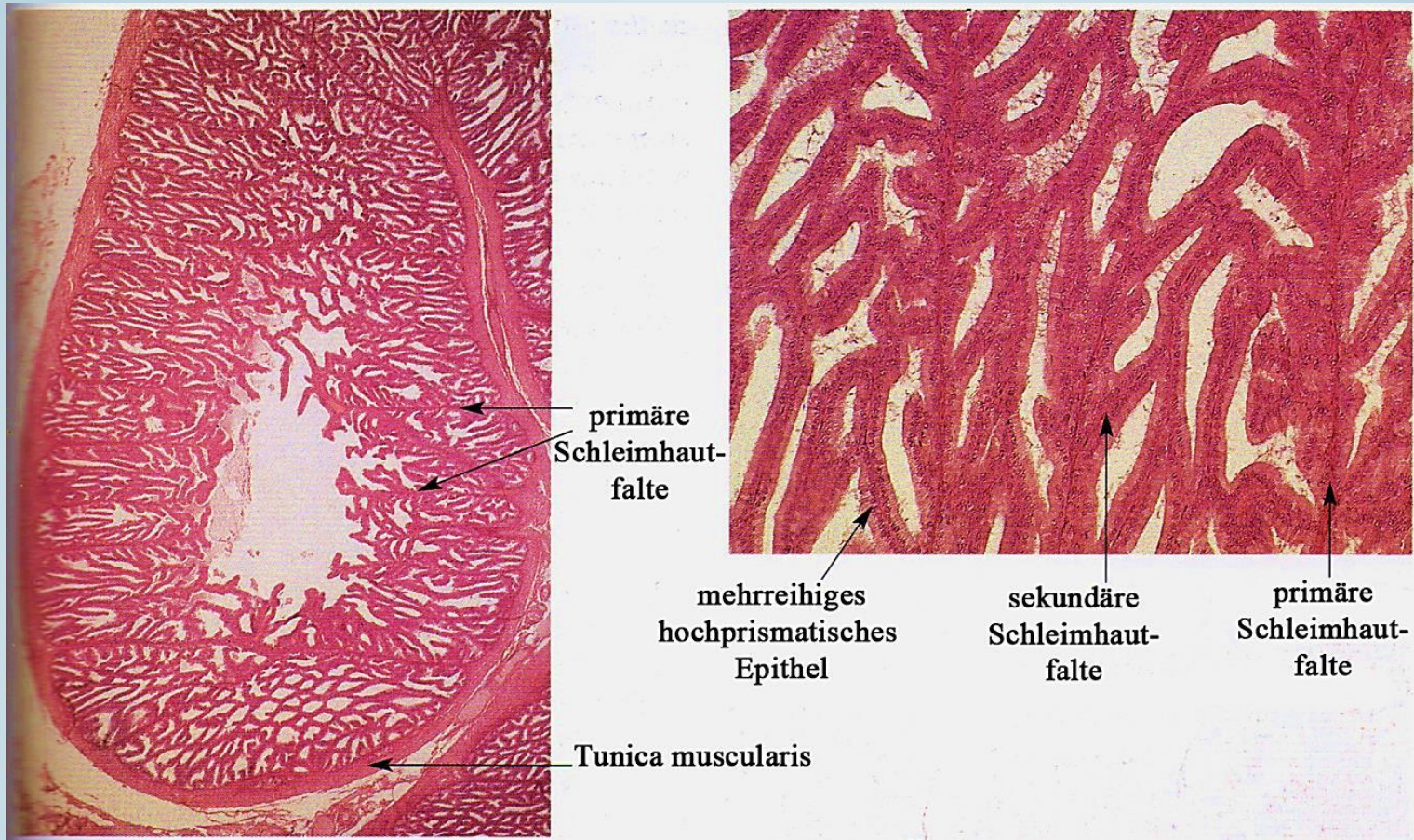
Together with the ampulla of the deferent
duct:

Ejaculatory duct

alkaline secretion rich in fructose and
proteins (about half of the ejaculate)

Secretion testosterone dependent

Mobility of spermatozoa



Highly folded inside: primary and secondary mucosal folds
 primary: only mucous membrane
 secondary: also the tunica muscularis

Generation of pseudolumina



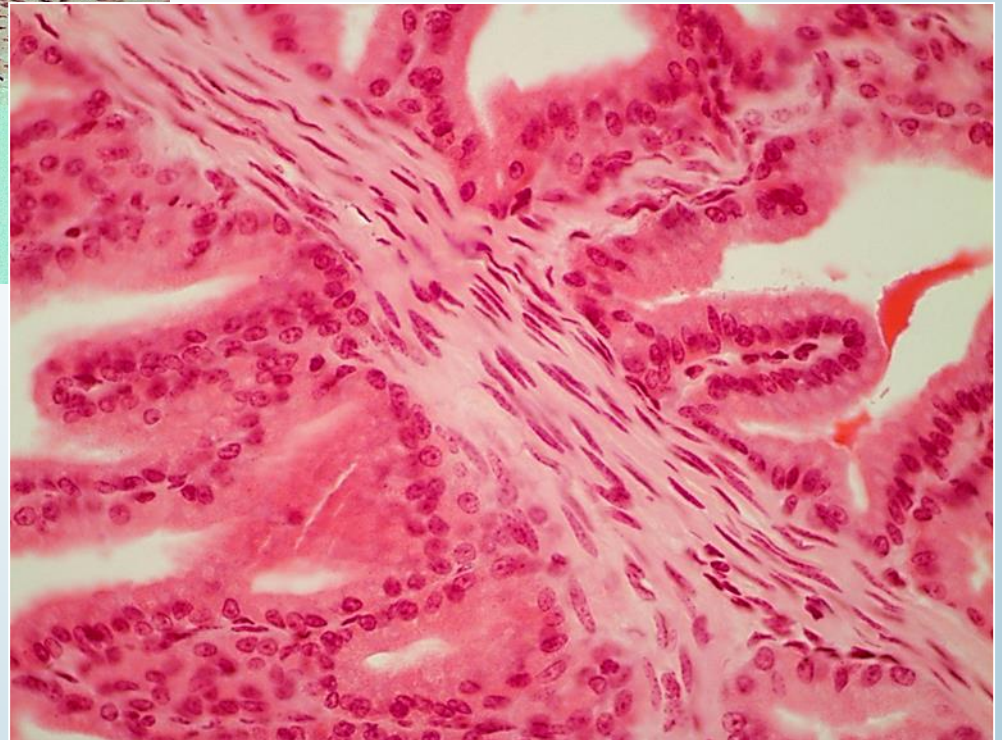
Tunica mucosa:

- Lamina epithelialis
1 or 2 rows
cuboidal or columnar
- Lamina propria
also in the secondary folds

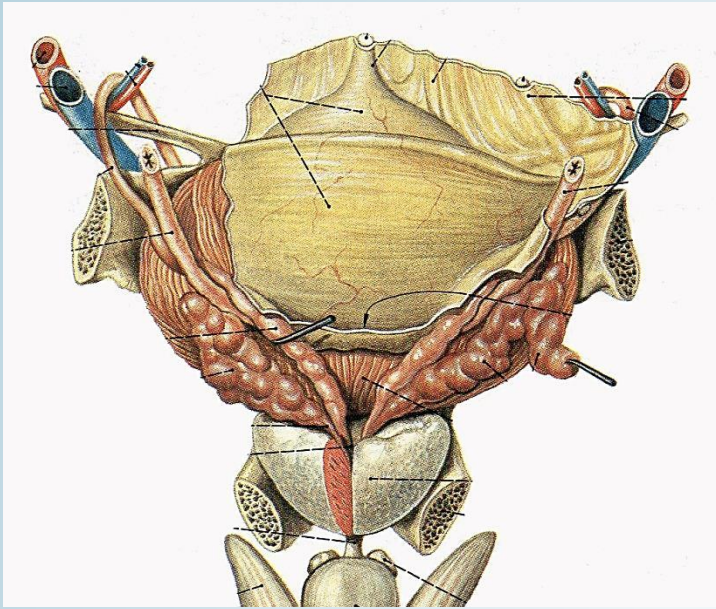
Tunica muscularis:

without layering
very strong (emission phase!)

Tunica adventitia



Prostate



ca. 3 x 4 x 5 cm

17 – 28 g (measurable with ultrasound!)

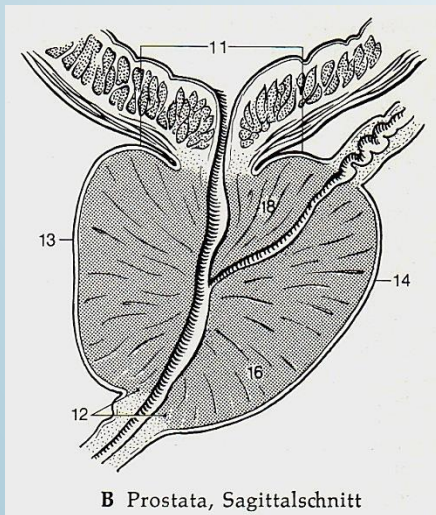
Basis prostate (to the urinary bladder)

Apex prostate (at the urogenital diaphragm)

Facies posterior (rectal palpable!)

Facies anterior (to the symphysis)

prostatic fluid: Succus prostaticus



Lobus dexter et sinister

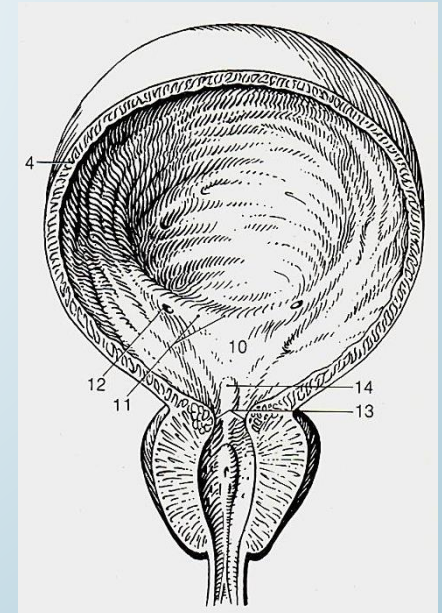
Lobus anterior (Isthmus prostatae):

Hypertrophy most common here!

Lobus posterior

Lobus medius

Prostatic part of the urethra



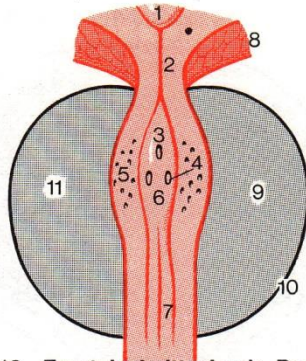


Abb. 2-218 **Frontalschnitt durch Prostata und Pars prostatica der Urethra** 1. Uvula vesicae 2. Crista urethralis 3. Mündung des Utriculus prostaticus 4. Mündung eines Ductus ejaculatorius 5. Sinus prostaticus mit Mündungen von Prostata-drüsen 6. Colliculus seminalis 7. Längsfalten der aufgeschnittenen Urethra 8. Muskulatur der Blasenwand 9. Lobus sinister der Prostata 10. Kapsel der Prostata 11. Lobus dexter der Prostata

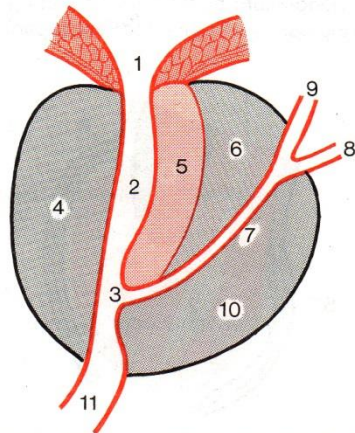
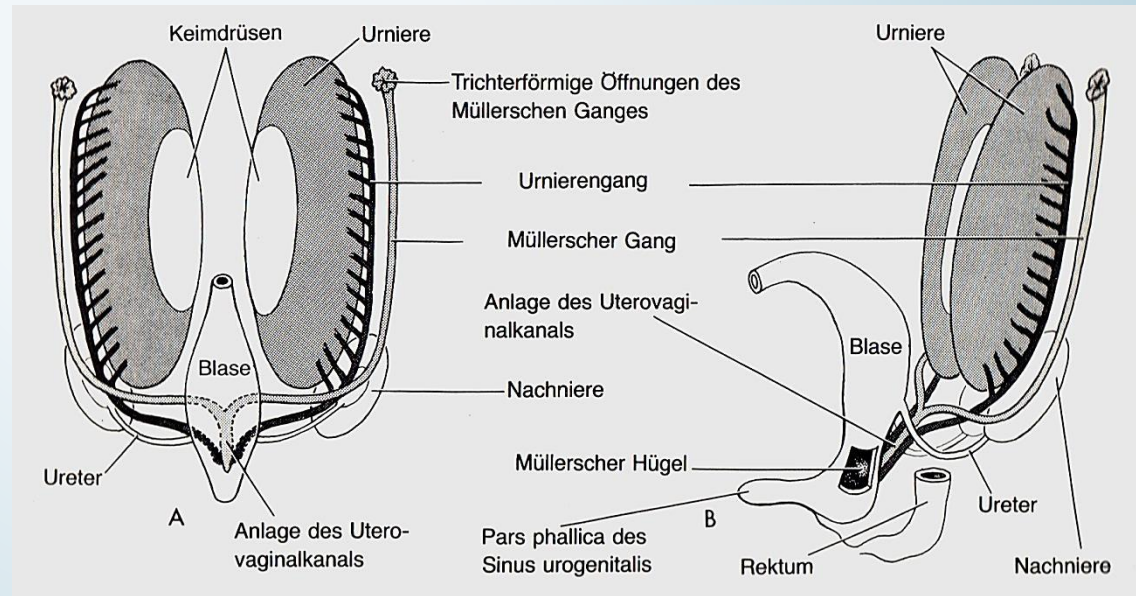
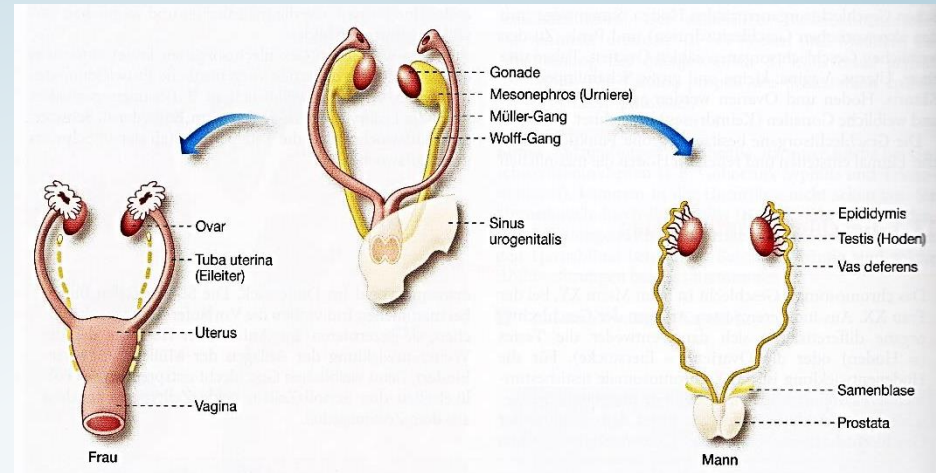
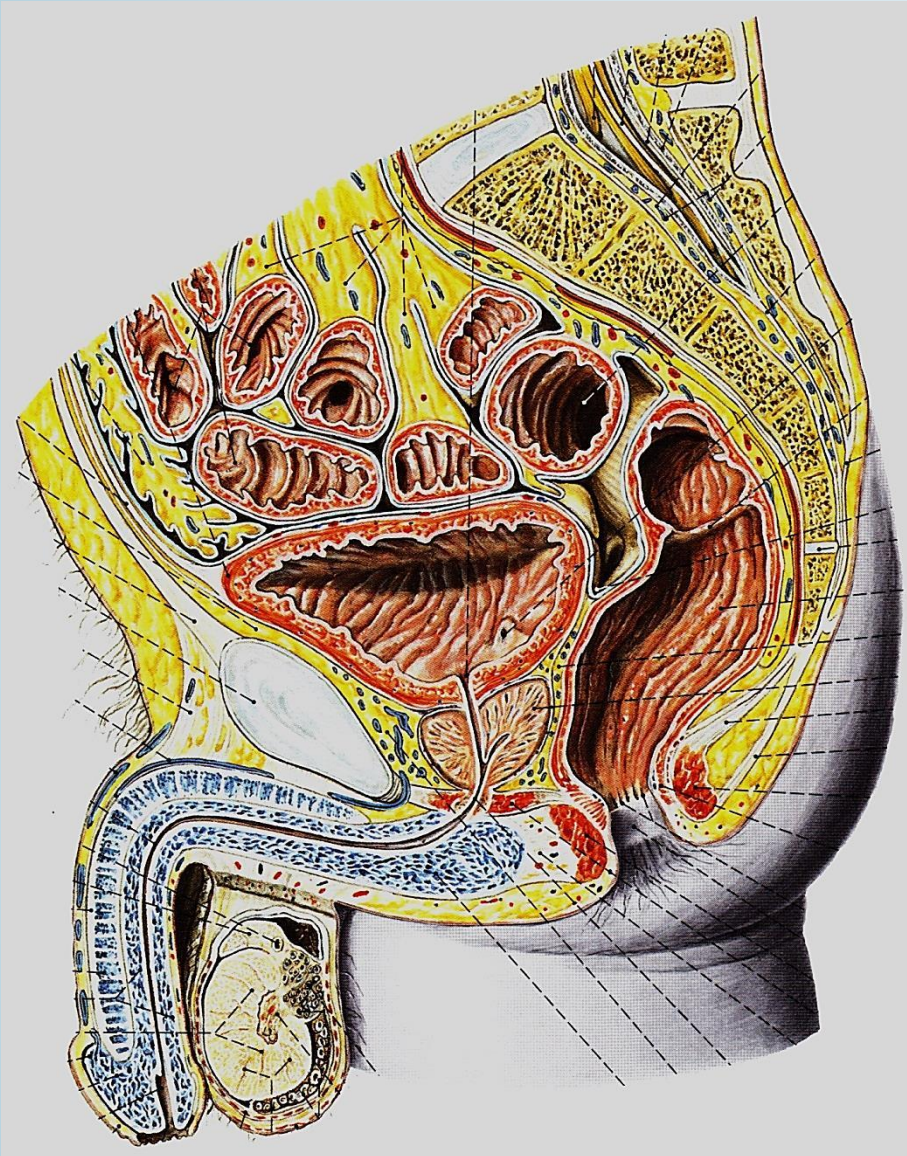


Abb. 2-219 **Parasagittalschnitt durch Prostata** 1. Cervix vesicae 2. Pars prostatica urethrae 3. Colliculus seminalis 4. Isthmus der Prostata 5. Periurethraldrüsen 6. Lobus medius der Prostata 7. Ductus ejaculatorius 8. Mündung der Glandula vesiculosa 9. Ductus deferens 10. Lobus posterior der Prostata 11. Pars membranacea urethrae



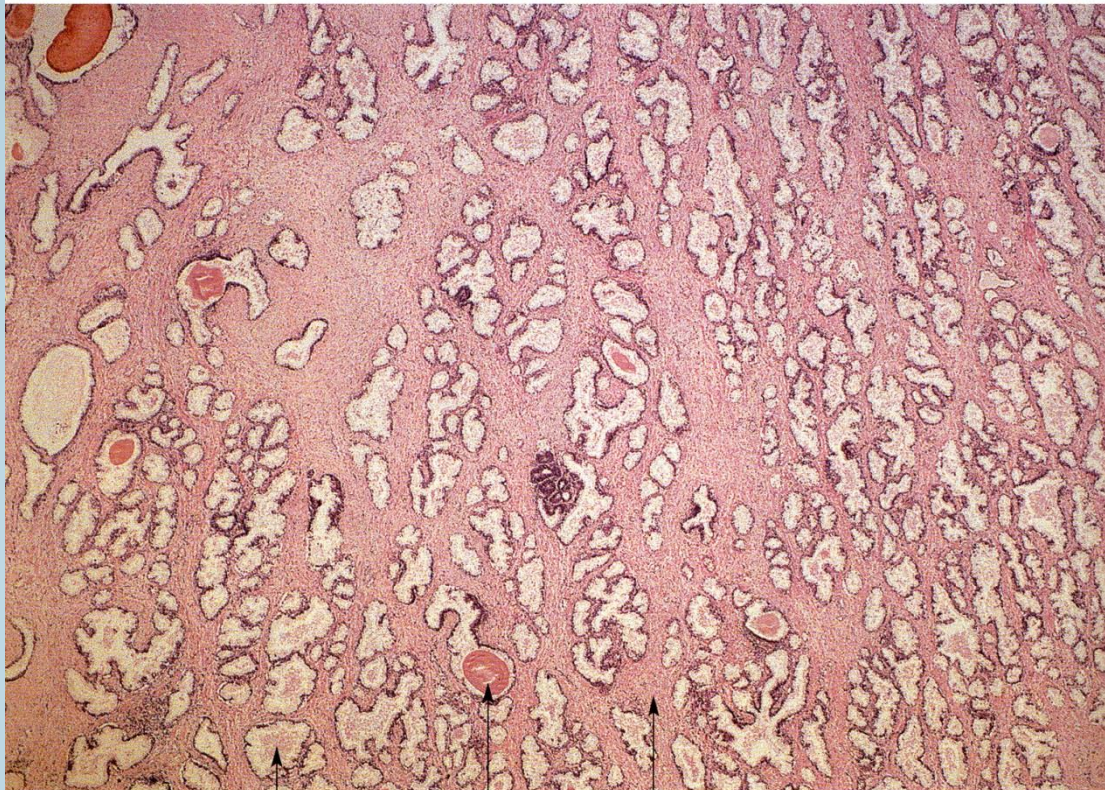


Prostatic plexus

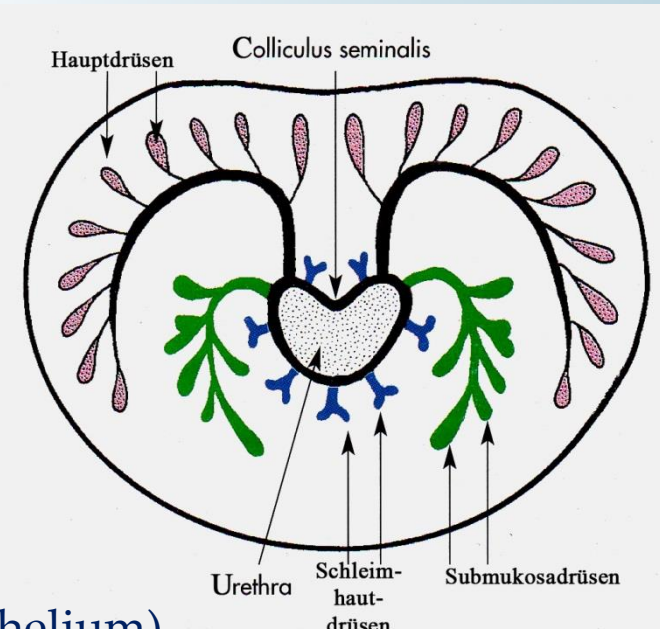
puboprostatic ligament

Urogenitale diaphragm

„Corpus glandulare“: 30 – 50 tubuloalveolar glands



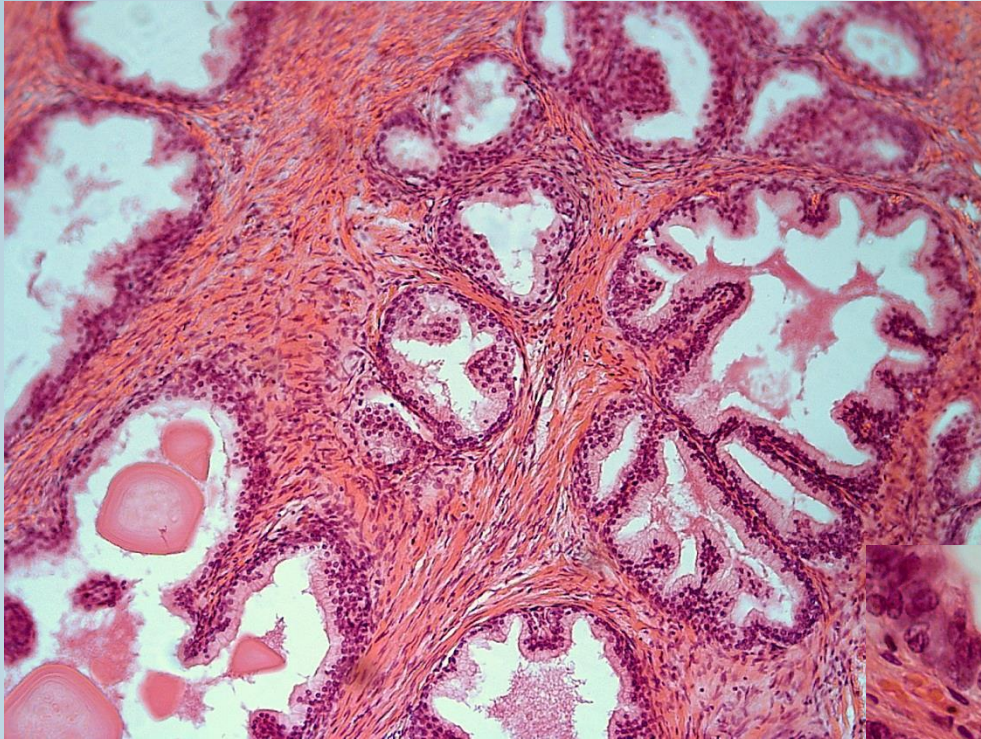
Drüsenlumen Corpus amylaceum Stroma



periurethral, mucous or mucosal glands
central or submucosal glands (inner zone)
peripheral or major glands (outer zone)

➔ Prostatic part of the urethra (transitional epithelium)

here entering the ejaculatory ducts and the prostatic duct



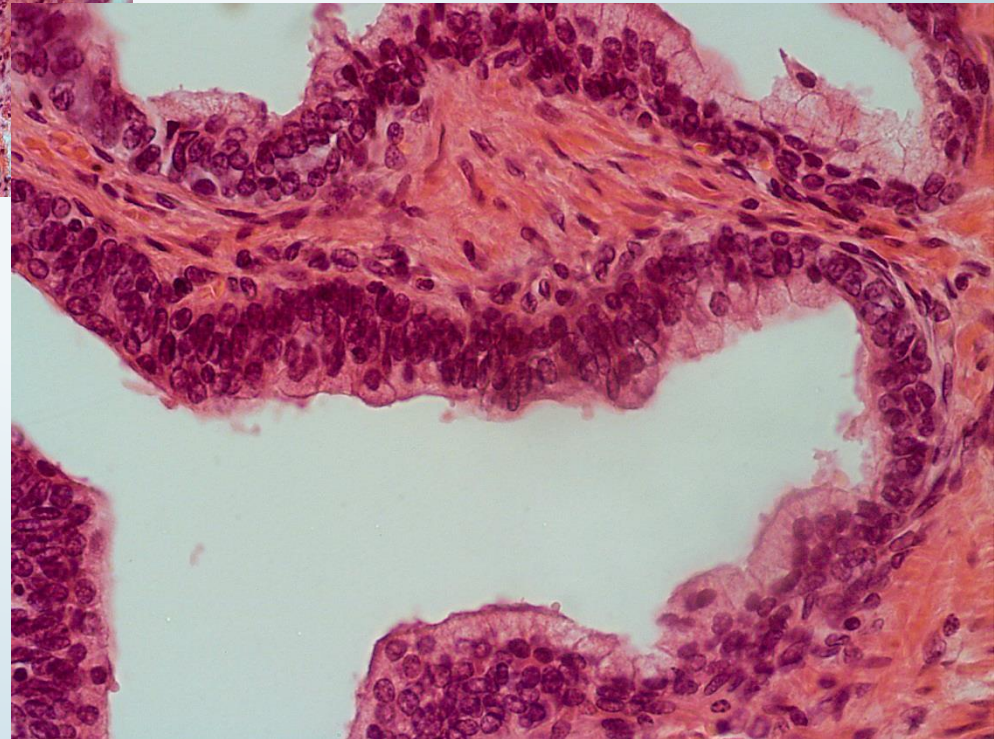
Epithelium:

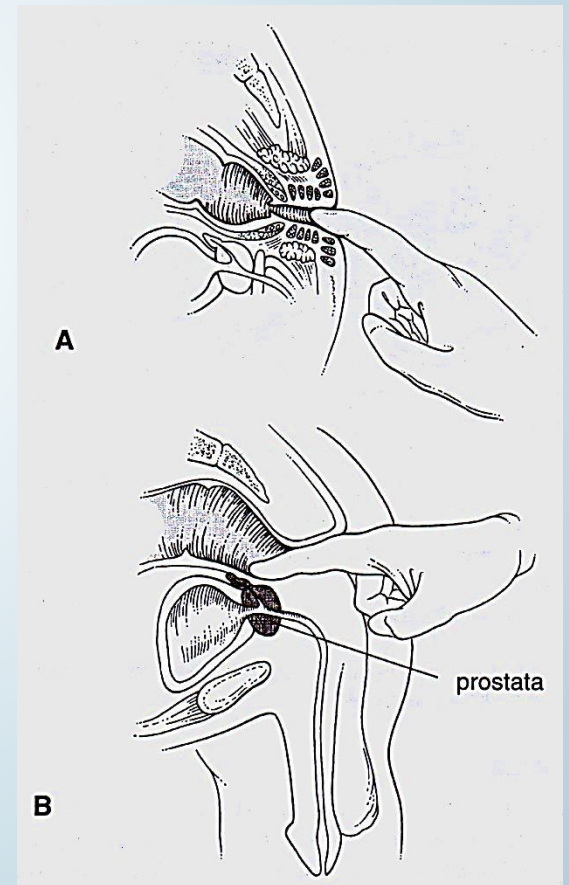
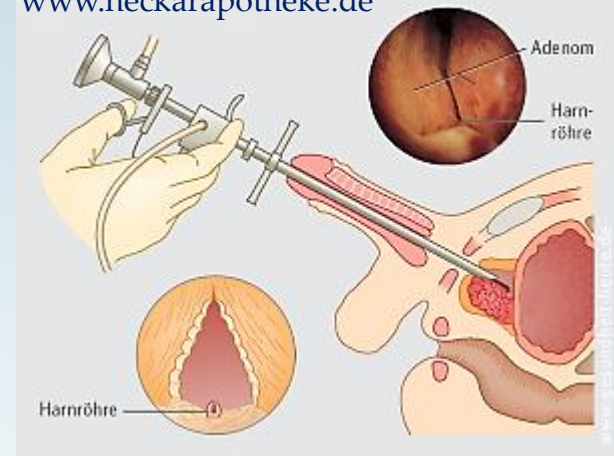
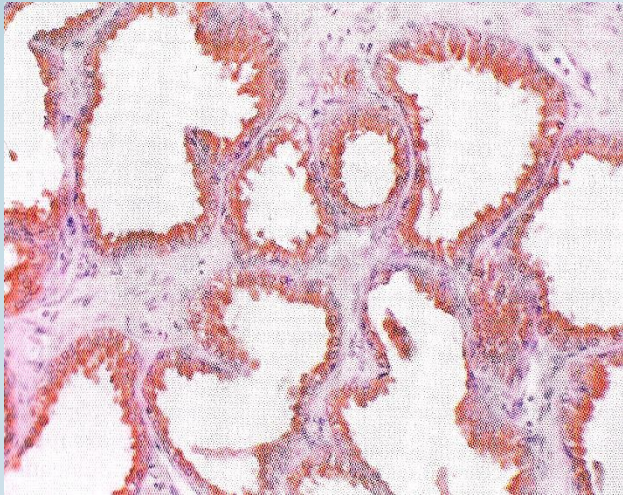
- pseudoapokrine secretion
- irregular epithel: between one-layered cuboidal and multi-row columnar

„Prostatic stones“ =
Corpora amylacea

Stroma:

Connective tissue and large amount
smooth muscle





GIBSON



Sorry I'm late...I slammed my finger in the car door.