

Histology of the Male Reproductive System

Dr Muhammad Aaqib Riaz

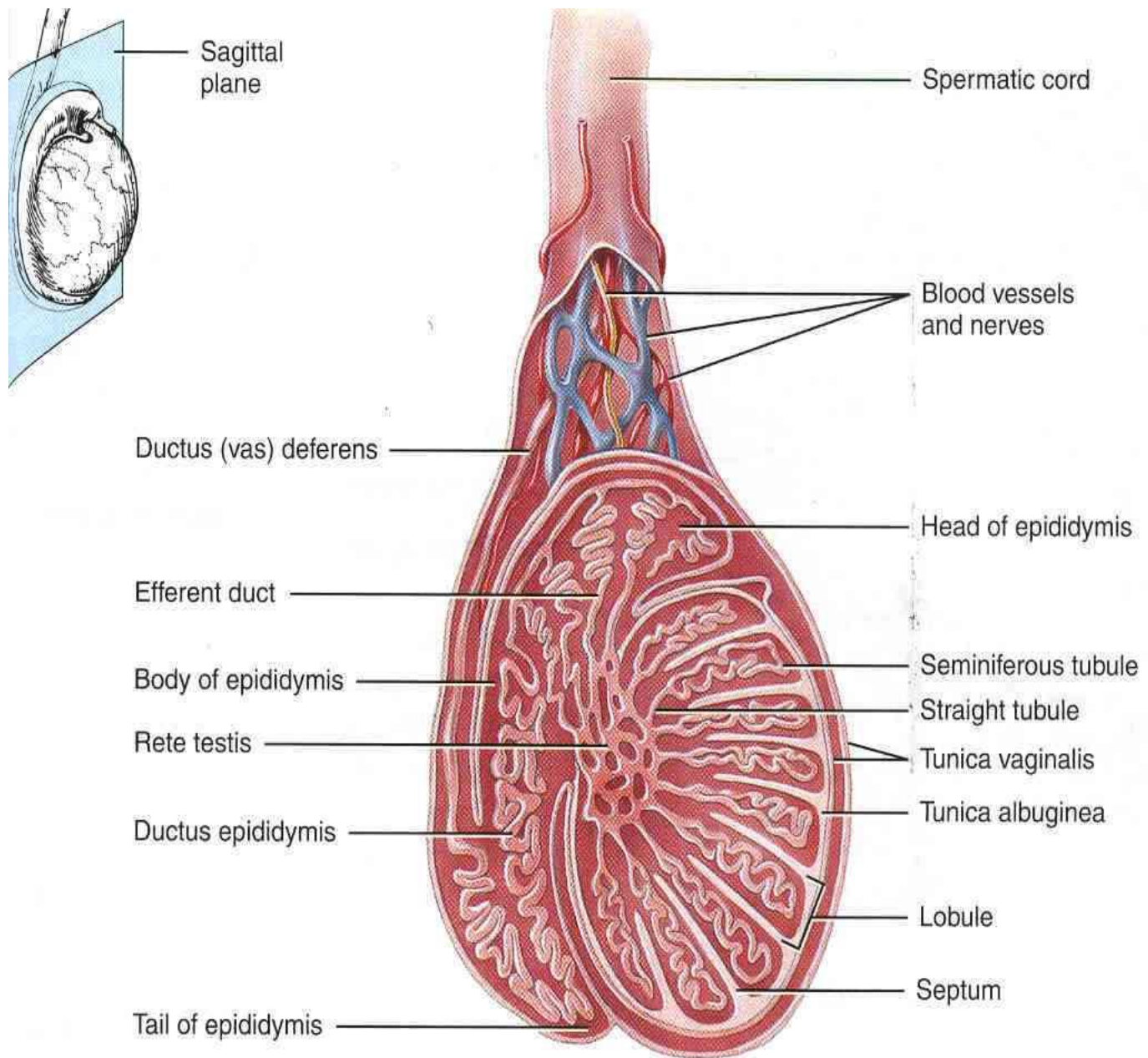
Anatomy Department

Sargodha Medical College

Male Reproductive System

The male reproductive system comprises the following four components

- A pair of primary sex glands – testes
- A system of genital ducts
- Accessory sex glands
- Penis



(a) Sagittal section of a testis showing seminiferous tubules

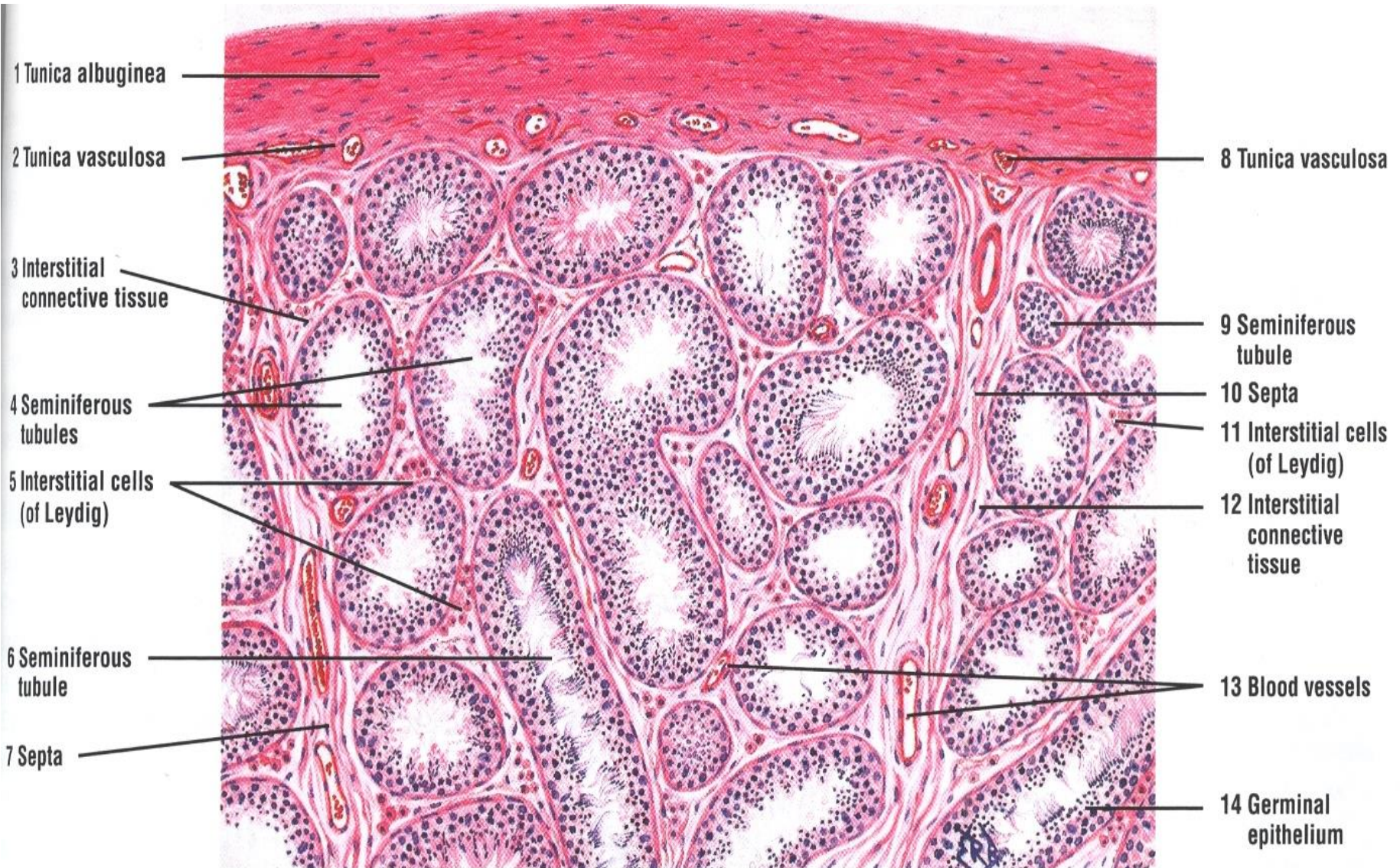
Testes

- The testes perform both exocrine and endocrine function and consider to be compound tubular gland.
- The exocrine function is to produce the male gametes (Sperm) .
- The endocrine function is the secretion of testosterone.

Testes

- Each testis is covered by a thick capsule of dense irregular connective tissue called *tunica albuginea*.
- Beneath the *tunica albuginea* there is a layer of loose connective tissue known as *tunica vasculosa*.
- Many septa arise from mediastinum called *septula testis* divide the organ into many compartments called *testicular lobules*.
- Each testicular lobule contain one to four highly convoluted tubules called *Seminiferous tubules* supported by connective tissue.

Histology of testes



Seminiferous Tubules

- The seminiferous tubule is lined by seminiferous epithelium which is a modified stratified cuboidal epithelium.
- The epithelium rest on basal lamina and is surrounded by a thin layer of connective tissue called tunica propria.
- Seminiferous epithelium consist of two types of cells
 - 1) Spermatogenic cells
 - 2) Sertoli cells.

Spermatogenic cells

- These cells lie between the sertoli cells and form a stratified epithelium which occupy the space between the basal lamina and lumen of seminiferous tubule.
- Before puberty only primitive germ cells called spermatogonia are present.
- After puberty process of spermatogenesis starts and spermatogenic cells are seen in various stages.
 - ✓ Spermatogonia
 - ✓ Primary spermatocytes
 - ✓ Secondary spermatocytes
 - ✓ Spermatids

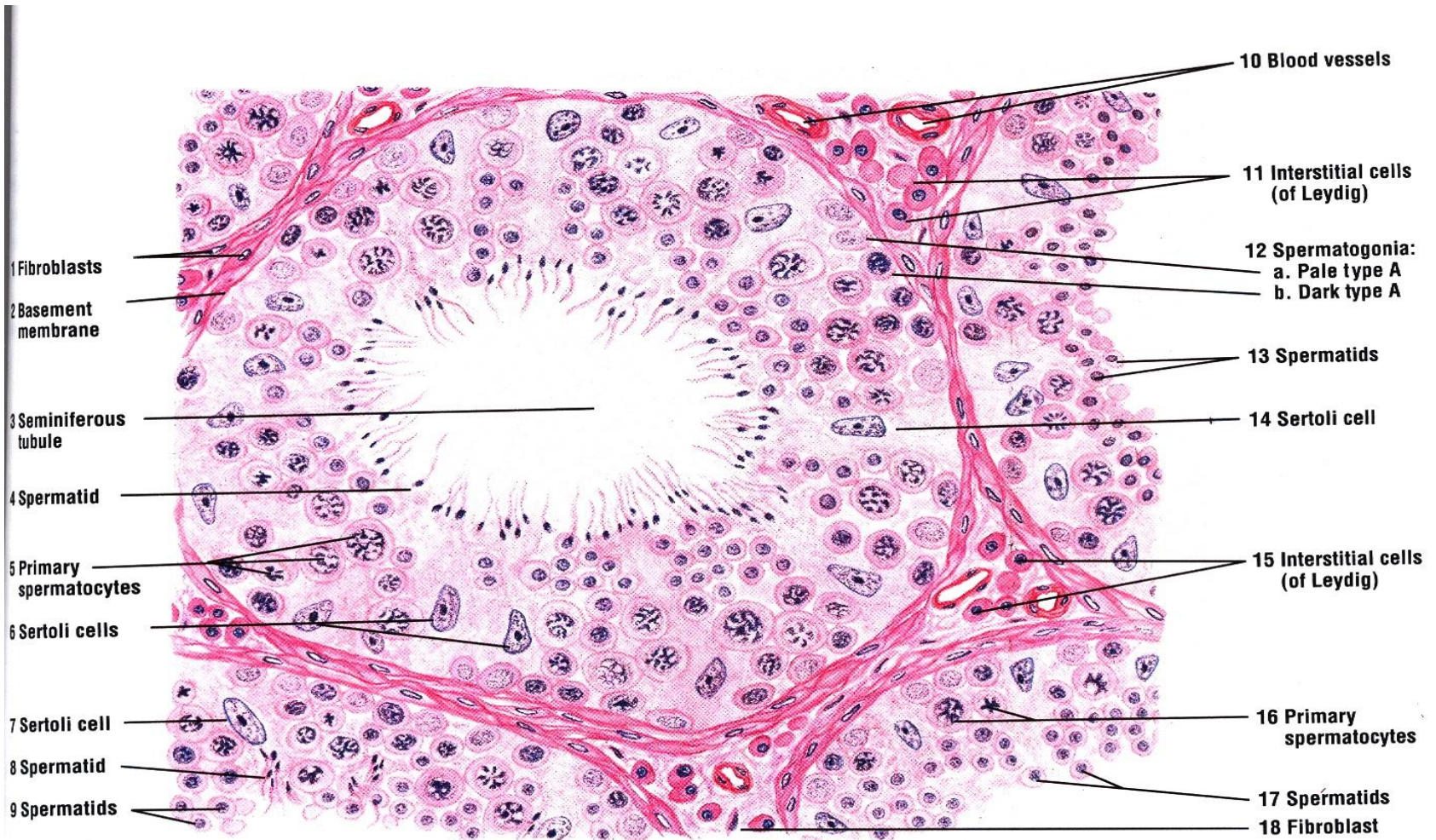
Spermatogenic cells

- The **spermatogonia** are present near the basal lamina are spherical cells containing centrally located rounded nucleus.
- **Primary spermatocyte** lie next to the spermatogonia are large cells having vesicular nuclei.
- The **secondary spermatocytes** are smaller cells and arise from primary spermatocyte.
- The **spermatids** are produced by secondary spermatocytes by second meiotic division. They lie adjacent to the lumen of the seminiferous tubule.

Seminiferous Tubules



Spermatogenesis in seminiferous tubules



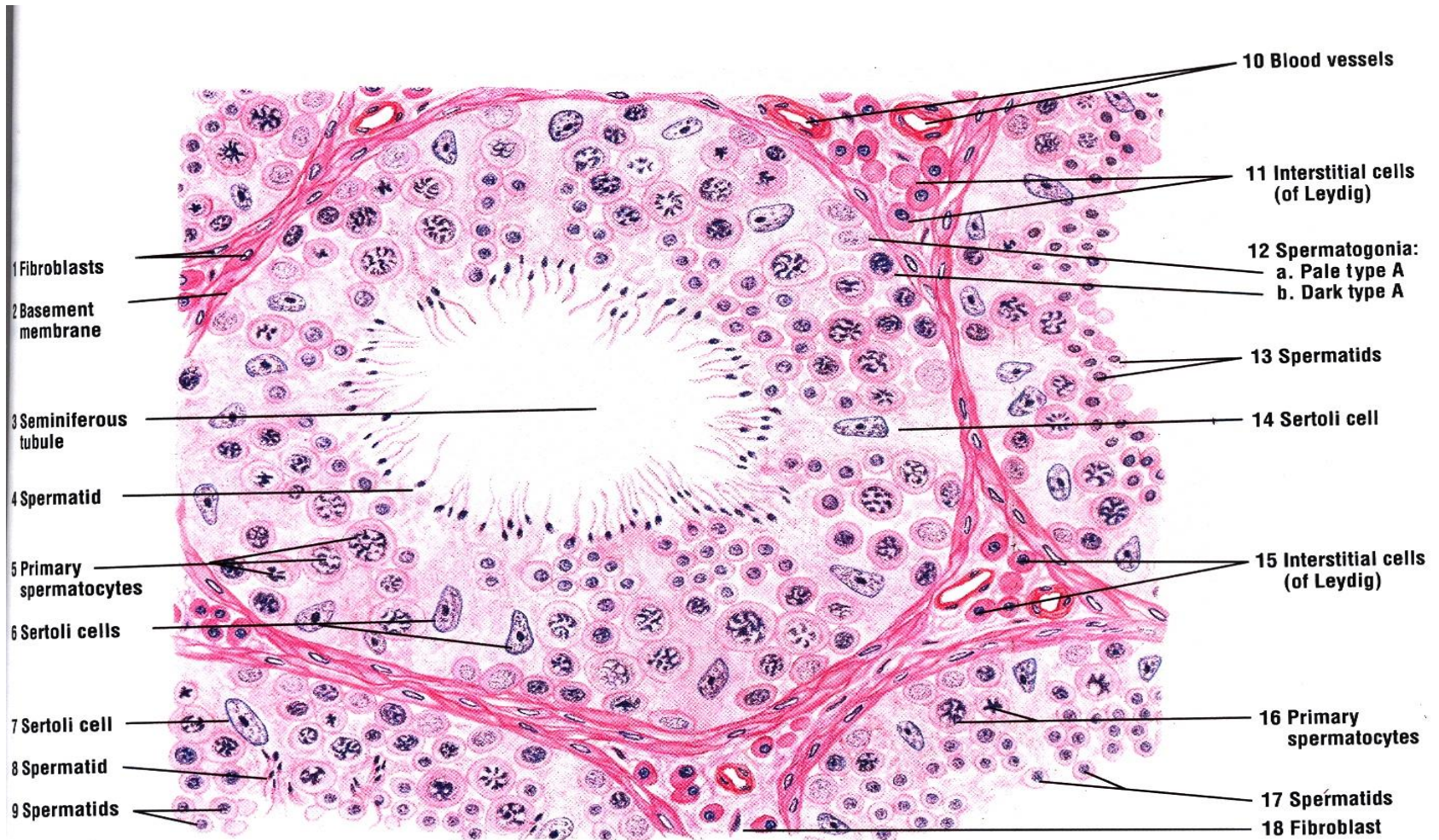
Sertoli Cells

- Sertoli cells also called sustentacular cells are tall columnar cells that extend from basal lamina to the lumen of seminiferous tubule.
- Sertoli cell has large pale staining nucleus located in the basal portion of the cell.
- Luminal surface has grooves in which head of sperms are embedded.

Functions:

- ✓ Physical support, protection and nutrition of the developing sperm (spermatids)
- ✓ Phagocytosis of cytoplasm developing sperm (spermatids)
- ✓ Produce and release androgen binding protein.

Sertoli cells in seminiferous tubules

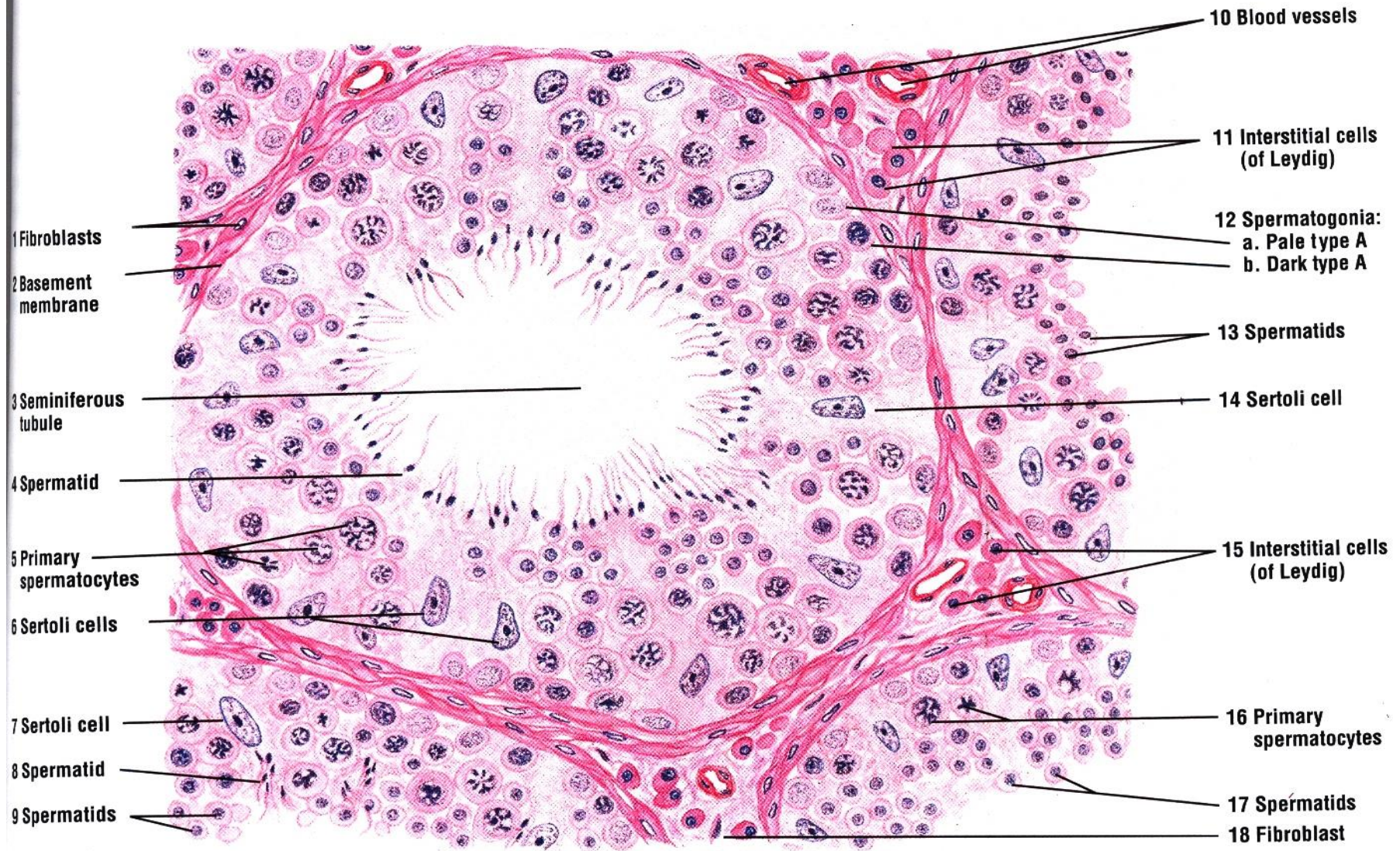


Intertitial cells of Leydig

- The spaces between the seminiferous tubule is filled by connective tissue.
- It contains collagen fibers, lymph vessels, blood vessels and nerves.
- Several types of cells are also present which include fibroblast, macrophages and mast cells.
- In addition endocrine cells Intertitial cells of lydig are also present.

Intertitial cells of Leydig

- They are ovoid cells having central darkly staining nucleus and eosinophilic cytoplasm.
- The cytoplasm contain mitochondria, well developed golgi apparatus and abundant SER.
- The leydig cells secrete male sex hormone testosterone.

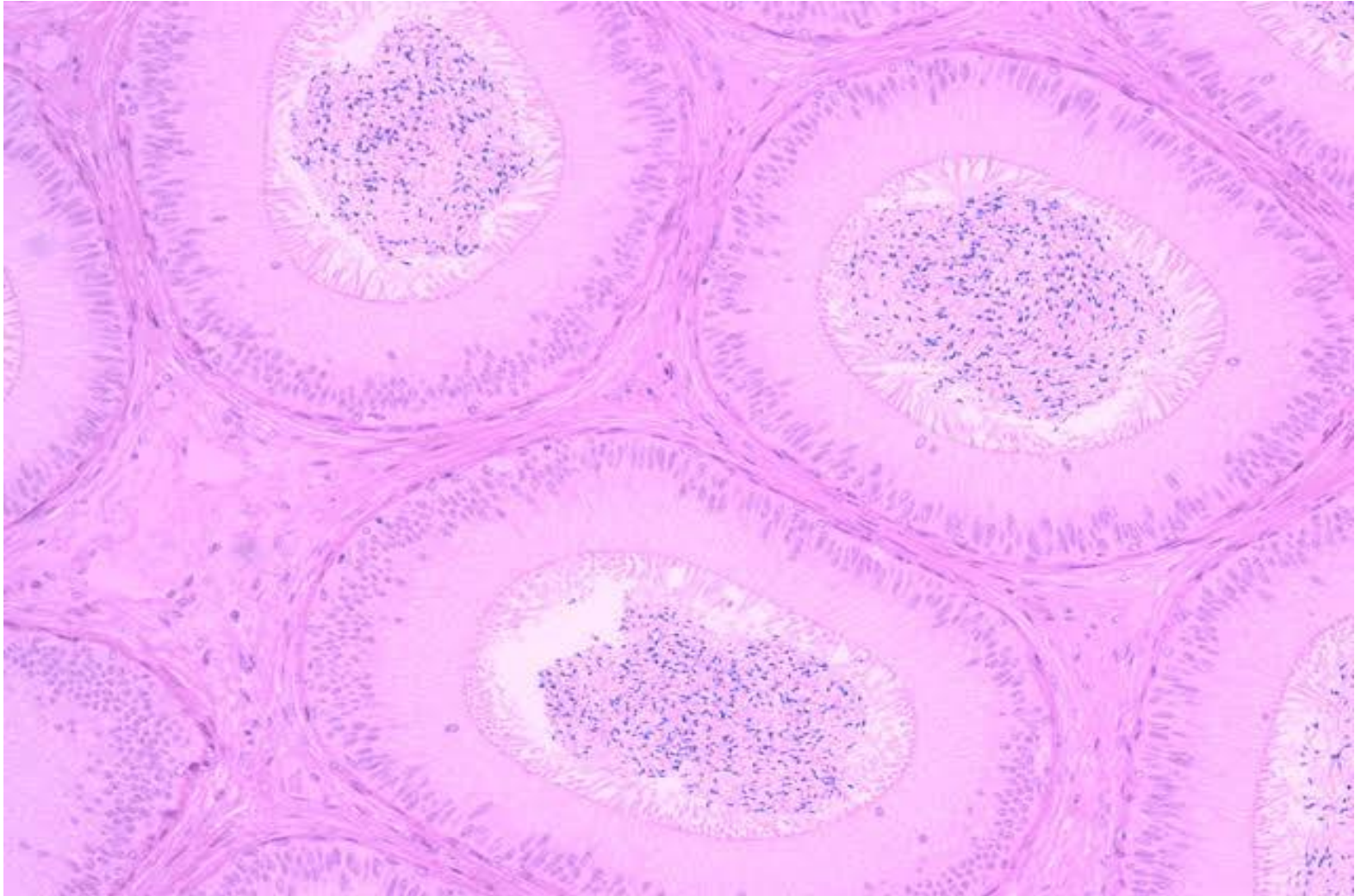


Interstitial connective tissue containing Cells of Leydig

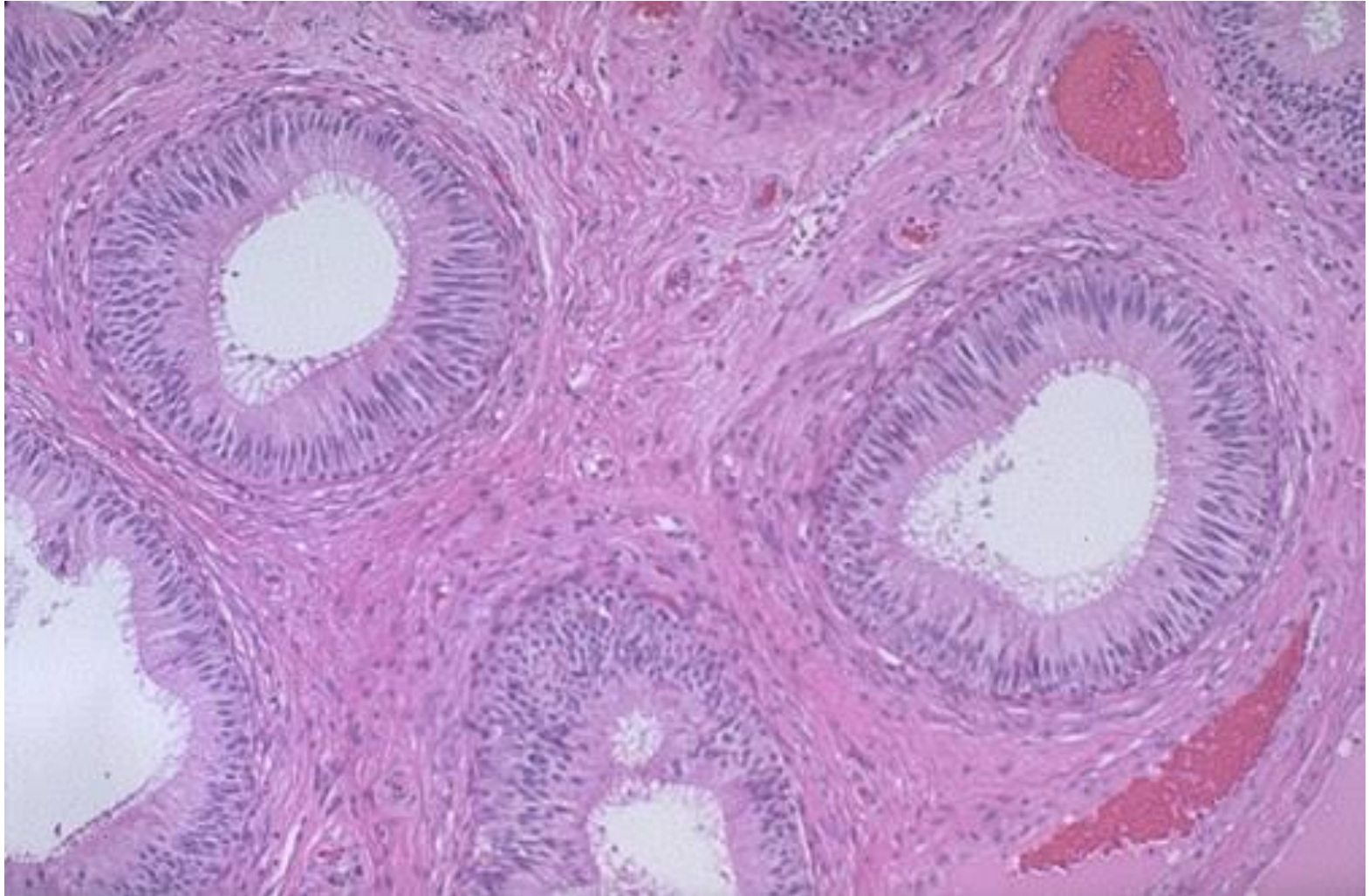
Epididymis

- A highly convoluted tube resting upon posterosuperior surface of testis called epididymis.
- It is divided into three parts:
 - 1) **Head**
 - 2) **Body**
 - 3) **Tail**
- The duct of epididymis is lined by pseudostratified columnar epithelium composed of tall columnar cells and basal cells.
- The columnar cells bear stereocilia on their luminal surface.
- The lining epithelium is surrounded by circularly arranged smooth muscle fibers.

Epididymis



Epididymis



Ductus deferens

- Is a thick muscular tube which conducts the spermatozoa from the epididymis to the seminal vesicle.
- It has three coats
 - Mucosa
 - Muscularis
 - Adventitia

Ductus deferens

Mucosa:

- Is thrown into longitudinal folds due to which appear as star shaped lumen.
- Is lined by pseudostratified columnar epithelium in which tall columnar cells bear stereocilia on luminal surface.
- The apithelial cells rest on basal lamina which consist of connective tissue.

Ductus deferens

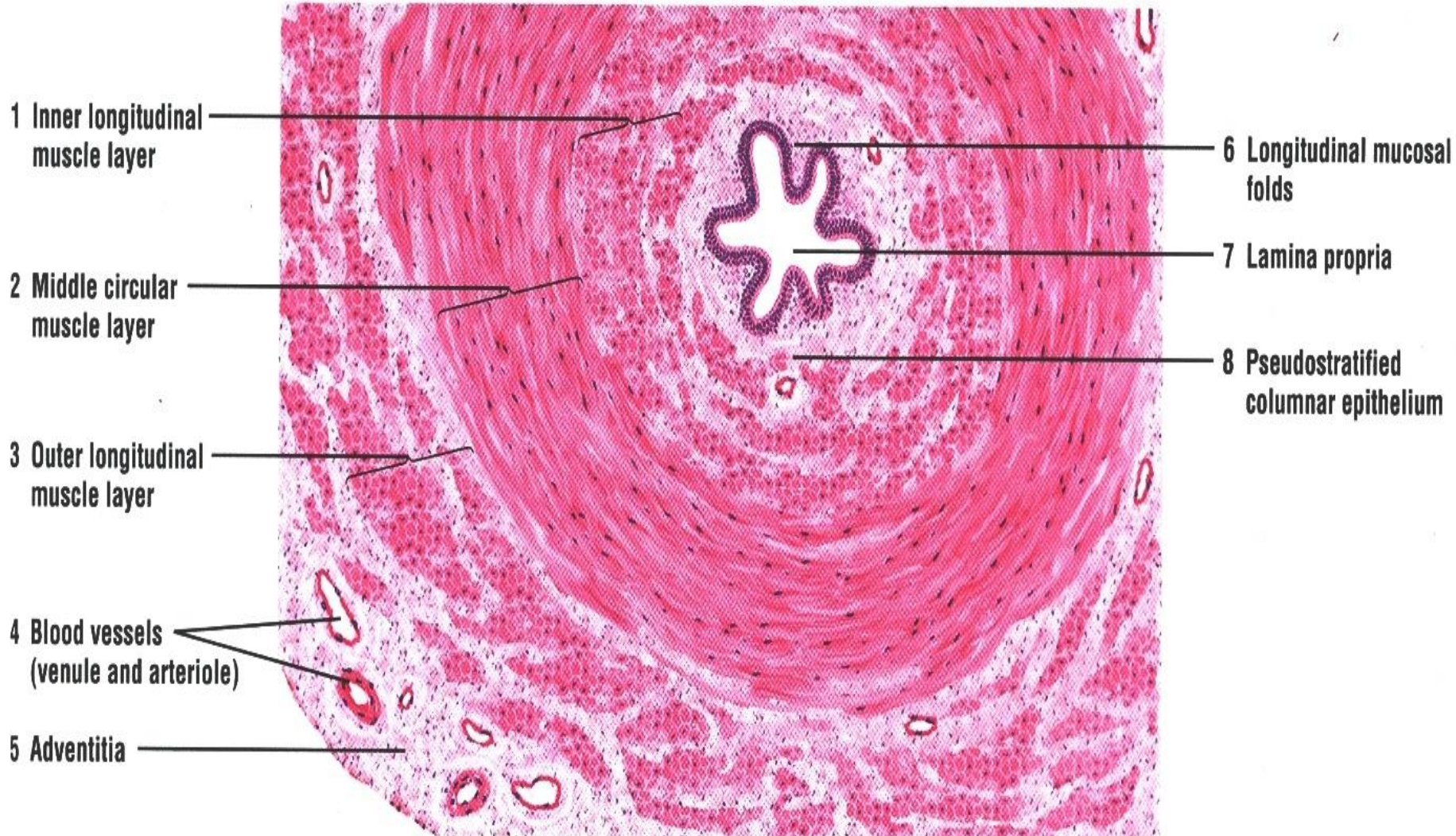
Muscularis:

- The smooth muscle coat is thick and three layered.
- The inner and outer layers consist of longitudinal muscle fibers.
- The intermediate layer is made of circular muscle fibers.

Adventitia:

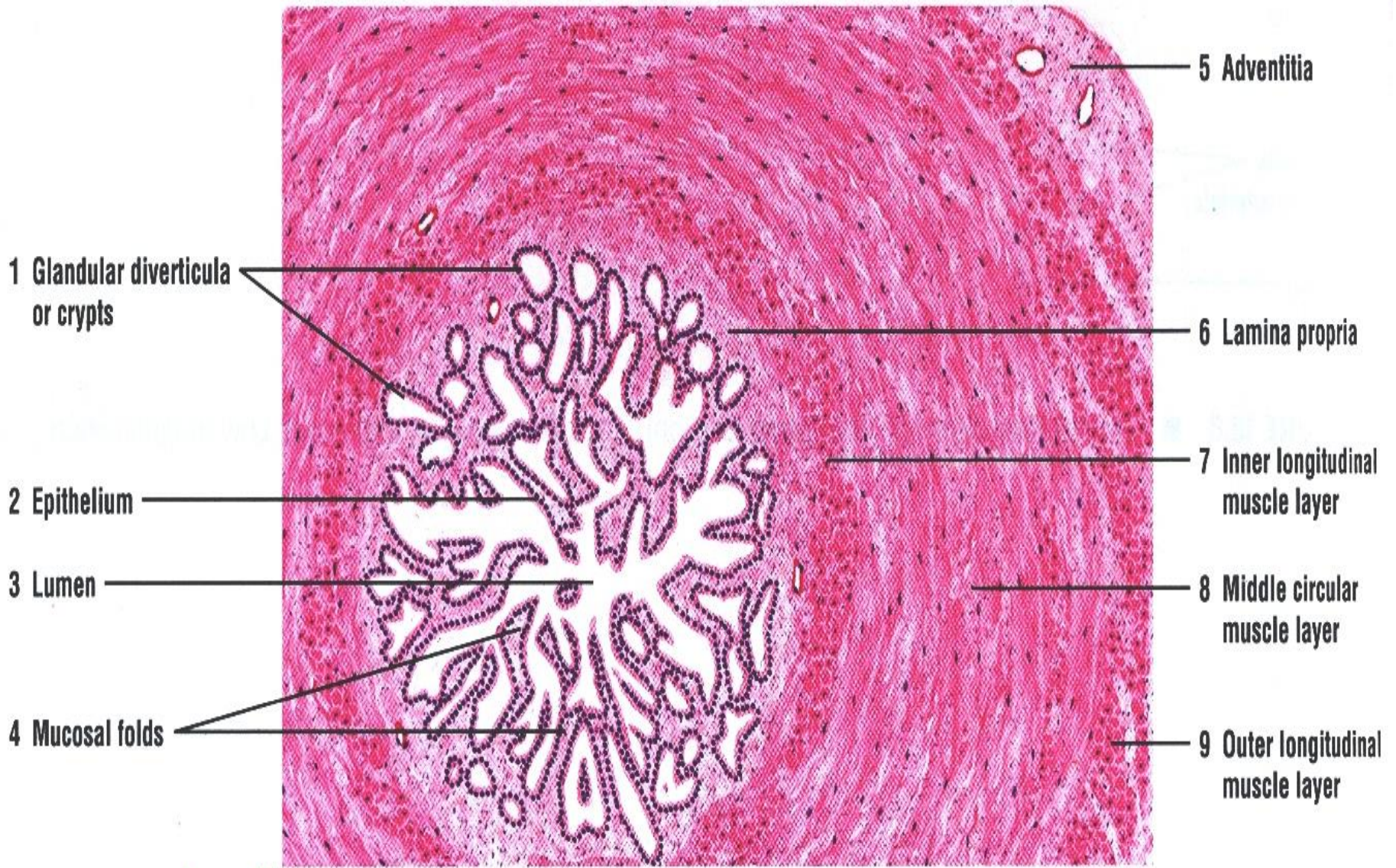
- Is a thin layer of connective tissue and contains abundant blood vessels and nerves.

Histology of vas deferens



Ampulla of the vas deferens

- Terminal portion of the vas deferens enlarges into an ampulla
- Lumen of ampulla larger than vas deferens.
 - Numerous irregular branching mucosal folds
 - Deep glandular diverticula or crypts
 - The mucosa is lined by simple columnar epithelium.
- Lamina propria
- 3 layers of Smooth Muscle
 - Thin inner longitudinal
 - Thick middle circular
 - Thin outer longitudinal



Ampulla of the vas deferens