Functional Anatomy of the Reproductive Tracts, and Male Reproductive Anatomy

Pre-Lab Guide

NOTE: A very useful “Study Guide”!

This Pre-lab Guide acts as an outline to the information on male reproductive anatomy presented to you by Armando Hasudungan:

https://www.youtube.com/watch?v=k1aFBOy6dDI

This material is on your wordlist!
III. Male Reproductive Anatomy

– We will be using a video prepared by Armando Hasudungan:
  https://www.youtube.com/watch?v=k1aFBOy6dDI

In this video, he draws the male tract while explaining its functional anatomy. I have included screen shots of the finished images you should concentrate on. However, he does not quite cover everything we will see in lab.

At the end of these notes, I have a few addendums ("add on") that are not mentioned in his videos, but that we will be seeing in lab. In lab, stick to your wordlist!

A) Overview

- The male reproductive system can be thought of as a series of tubes.
  * These tubes deliver the male gametes (sperm) from their site of production in the testes to their destination outside the body.

- The male tract shares the urethra with the urinary tract. The male perineum only has 2 exits: the anus for the digestive tract, and the urethra.

- The system itself is divided into two distinct units:
  1. The testes located outside the major body cavity and housed in the scrotum.
     * Sperm is stored in the epididymis until ejaculation occurs
  2. The excretory duct system which takes sperm to outside world, and accessory glands, which produce and modify the contents of semen.
    * Ductus deferens (vas deferens), which transports the sperm from the testes to the seminal gland, which adds the majority of semen.
    * Ejaculatory duct (NOT MENTIONED IN VIDEO UNTIL LATER) – Seminal vesicle to prostate gland.
    * Urethra – from prostate gland to outside through penis.

INTERESTING NOTE: during ejaculation, the urinary urethra is closed, so urine cannot mix with semen!
B) Testes

- Functional Anatomy:

1. The testes are a source of gametes and steroid sex hormones. Protected by the scrotum.

2. The testes are made up of seminiferous tubules, which are the site of sperm production.

The testes are divided into lobules by thin septa. Each of these lobules contains between one and four seminiferous tubules.

3. The seminiferous tubules lead to the epididymis, which is a thickened area on the back of the testes. It then connects to the ductus deferens, or vas deferens.

Blood vessels come and go through the scrotum.

4. The seminiferous tubule contains several important cell types. The first two of these are found in the germinal epithelium, the layer of the seminiferous tubule in which gamete production and development occurs:

   • Interstitial (Leydig) cells are located within the loose connective tissue surrounding the seminiferous tubules. They produce testosterone.

   • Sertoli (Nurse) cells keep the germ cells healthy and nourished, among other things.

   • Spermatogenic cells in the wall of the tubule itself. This category includes the stem cells, and each of the stages between the immature spermatogonium and the mature spermatozoa in the lumen.

These cells appear in layers that represent advancing stages in their maturation towards the lumen. They develop via special process called meiosis.

Final maturation in the epididymis.

More detail in lecture!

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THE NEXT SECTION HE COVERS - ON SPERM SYNTHESIS - WE WILL NOT DO IN LAB
C) Detail on the excretory duct system (outside the testes), and the Accessory gland which make semen.

1. The seminiferous tubules, which are continuous with the Excretory Duct System.

The excretory duct system brings the spermatozoa from the testes to the outside of the body. This system is composed of several distinct tubes:

- The epididymis is a muscular, convoluted tubule that stores spermatozoa and is the site at which they acquire their motility.
- The ductus (vas) deferens is the tubule that carries sperm from the epididymis towards the penis.
  * Muscular tube passing up from scrotum, leading to posterior surface of bladder into urethra.
- SIDENOTE: The urethra is shared by the urinary tract in males. Coming in from the bladder is the urinary urethra. But soon it will hook up to the reproductive tubes.
- The ductus deferens takes sperm to the seminal vesicle, a gland which makes the majority of semen. The ejaculatory duct is formed by the union of the vas deferens with the duct of the seminal vesicle.

  We will discuss semen in more detail in lecture.

- The ejaculatory duct takes sperm + fluids to the prostate gland.