

TESTES HISTOLOGY AND EMBRYOLOGY

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Testes are coupled, bilateral male reproductive organs located within the scrotum. The location of these organs exterior to the abdominal cavity provides optimal heat for the environment in which germ cell production occurs [1-3]. Testes function as both an exocrine and endocrine gland so that they carry out the production of male germ cells, the spermatozoa, and the related sex hormones androgens, respectively [3-5]. These two functions are performed by two different parenchymal components of the testes. The first component is the seminiferous tubules, which harbor the gonadal cells at different developmental stages and the supportive Sertoli cells. The second component is the Leydig cells residing within the stroma surrounding the seminiferous tubules.

TESTIS HISTOLOGY

Like most organs in the human body, each testis is composed of a parenchyma and a supportive stroma. The stroma of the testis first surrounds this oval-shaped organ externally, forming a capsule around it. Two layers of capsule are distinguished histologically. The thick outer layer, which is dense, irregular fibroelastic connective tissue, is called *tunica albuginea*. The narrow inner layer, which consists of loose connective tissue rich in blood vessels, is the *tunica vasculosa* [4-6]. Because testes first develop on the posterior abdominal wall, just behind the peritoneum, they carry away a part of the peritoneum with them as they

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and it remains suspended to the wall by the *mesorchium*, which is a mesodermal tissue fold carrying the vessels and nerves of the gonad. The testis is also attached to the gubernaculum, which corresponds to the inguinal ligament of the mesonephros in the early developmental period [7, 10, 11].

The descent of the testis, which starts during the tenth week of pregnancy, occurs in two phases: the first is the *transabdominal phase*, and the second is the *inguinoscrotal phase (transinguinal descent)* [7, 10, 11]. The migration process is affected by many factors involving the growth of the embryonic body, increase in abdominal pressure, the effects of testosterone, the regression of the paramesonephric ducts, and the enlargement of the processus vaginalis [11]. In the transabdominal migration period, testis move till the level of the inguinal canal through the activation of INSL-3, whose effects result in the enlargement of the gubernaculum. During the inguinoscrotal phase, the descent occurs under the influence of testosterone and with the guidance of the gubernaculum, and the testis arrives at its final destination, the scrotum, generally by about 32 weeks [7, 10, 11].

Failure during the migration of the testis on its way toward the scrotum causes it to remain on any part of its route, but mostly within the inguinal canal. This condition is called *undescended testis (mal descent of the testis)* or *cryptorchidism (hidden testes)*. Because the testis stays in an environment with a higher temperature, cryptorchidism causes degeneration of the germ cells and also increases the risk of testicular tumour [2, 10].

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