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## Histological structure of testis in soviet chinchilla rabbit

**S Jayachitra, C Lavanya, K Iniyah and K Balasundaram**

### Abstract

The testis consisted of convoluted seminiferous tubules which produces the spermatozoa. The testis of a rabbit was a compound tubular gland located in the scrotum and it was surrounded by a dense connective tissue capsule. The connective tissue capsule gives off numerous septa and divided the testicular parenchyma into numerous lobules. Each lobule contained the seminiferous tubules and the richly vascularized interstitial spaces contained the Leydig cells. The seminiferous tubules were composed of multilayered or stratified epithelium which consisted of various developing stages of spermatogenic cells. The sertoli cells were observed in the seminiferous epithelium. The Chinchilla rabbit have high commercial value and nowadays widely used in biomedical research for postnatal reproductive biology. Hence, the present study was undertaken to investigate post natal testicular histomorphology in Soviet Chinchilla rabbit.

**Keywords:** Testis, soviet chinchilla, rabbit, histology

### Introduction

The male fertility depends on gonadal differentiation, establishment of hypothalamo - hypophyseal - testicular axis, proliferation and differentiation of testicular cells and the beginning of puberty with proliferation and maturation of testicular cells <sup>[1]</sup>. The testis is a compound tubular gland which acts as both exocrine and endocrine organ by production of the spermatozoa and also involved in synthesis and release of testosterone. The testis is made up of seminiferous tubules containing seminiferous epithelium which is comprised of spermatogenic cells and supporting cells <sup>[2]</sup>. The rabbit is an excellent model used in various biomedical research such as embryonic development, oncology, cardiovascular studies and reproduction <sup>[3]</sup>. The rabbit is the smallest species and least expensive, that can be used for collection of semen in artificial vagina and evaluation of semen for identification of reproductive processes such as spermatogenic cycle <sup>[4]</sup>. The Chinchilla rabbit have high commercial value and nowadays used in biomedical research for postnatal reproductive biology <sup>[1]</sup>. The present study was undertaken to investigate the post natal testicular histomorphology in Soviet Chinchilla rabbit.

### 2. Materials and Methods

The present study was conducted at Department of Veterinary Anatomy, Veterinary College and Research Institute, Namakkal. A total of six male Soviet Chinchilla rabbits aged 24 weeks, slaughtered for meat purpose were utilized for the study. Testes samples were collected, washed in normal saline and fixed in 10 percent neutral buffered formalin. The fixed tissues were washed in running tap water overnight, dehydrated through ascending grades of alcohol (starting at 50 percent), cleared in xylene (three changes) and embedded in paraffin wax (melting point 58-60 °C) to prepare tissue blocks. The blocks were cut into serial histological sections of 5 µm thickness using Leica rotary microtome. The sections were stained by routine haematoxylin and eosin staining technique. The observations were obtained using Leica trinocular microscope with image analyzer at different magnifications. In low power magnification, the basic histological structure and tissue architecture of the testis was studied. In oil immersion, detail of individual cells were elaborated.

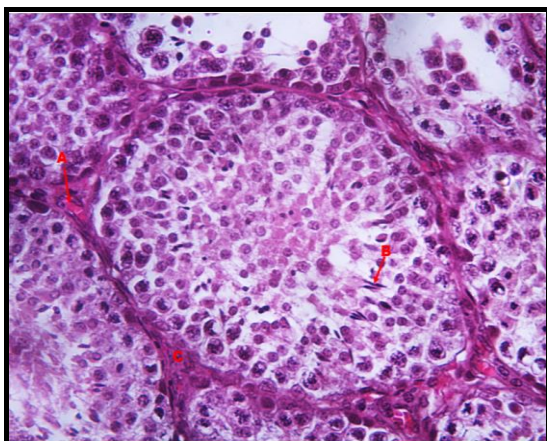
### 3. Results and Discussion

The testis of a rabbit was a compound tubular gland located in the scrotum as in domestic mammals. It was surrounded by a dense connective tissue capsule (tunica albuginea) and in

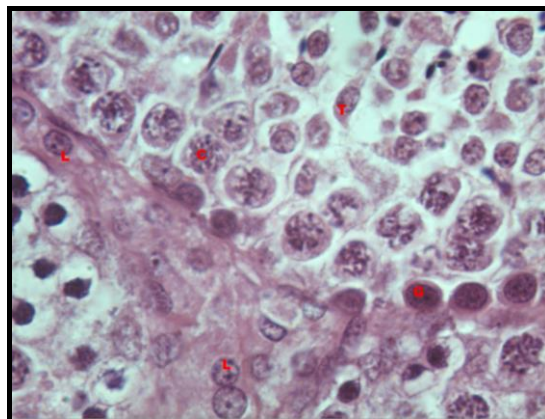
turn surrounded by a layer of peritoneum (tunica vaginalis) [2]. Similarly, the testes of quail was covered by a dense connective tissue capsule [5]. The connective tissue capsule gives off numerous septa which entered into the testicular parenchyma and divided it into numerous lobules. Each lobule contained the seminiferous tubules in rabbit [6] (Fig. 1). Richly vascularized interstitial spaces were noticed between the seminiferous tubules. These interstitial spaces contained clusters or dispersed population of Leydig cells (Fig. 2), small amount of connective tissue, blood vessels and lymphatics [7]. As recorded in most of the domestic animals, the Leydig cells were observed as small polygonal or pyramidal shaped cells with round nucleus and acidophilic cytoplasm [2].

At higher magnification, the seminiferous tubules were composed of multilayered or stratified epithelium. This seminiferous epithelium was surrounded by basal lamina and myoid cells (Fig. 3) in the testis of rabbit [8]. The seminiferous epithelium consisted of spermatogonia, various stages of spermatocytes and sertoli cells (Fig. 3) which coincided with the reports in sheep testis [9]. The spermatogonia were located near the basal lamina and contained round nucleus with condensed chromatin. These cells had undergone series of mitotic and meiotic divisions to produce various stages of spermatocytes and spermatids. The primary and secondary spermatocytes were round and smaller than the spermatogonia cells. The spermatids which were derived from spermatocytes appeared as small round cells with pale nuclei located towards the lumen of the seminiferous tubule [5]. The center of the seminiferous tubule lumen contained numerous spermatozoa which appeared as small oval to elongated cells with pointed tails directed towards the lumen [10] (Fig. 4).

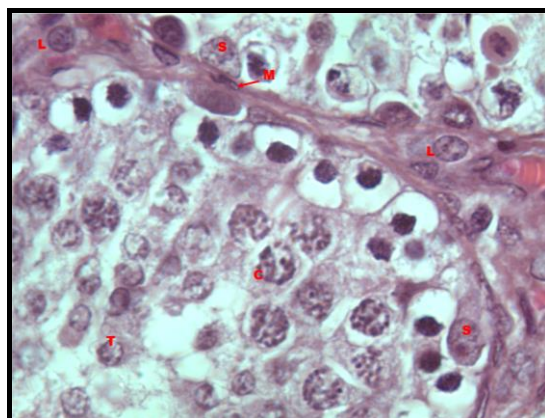
The sertoli cells were observed in the seminiferous epithelium and they were tall columnar cells extended from the basal lamina. These cells possessed irregular cytoplasm with prominent nucleoli. Similar observations were reported in testis of domestic fowl [11, 12]. The seminiferous tubules were surrounded by continuous sheet of single layered flattened polygonal myoid or peritubular cells with the characteristics of smooth muscle. Similar reports and the presence of thin concentric layer of myoepithelial cells, fibroblasts and connective tissue fibrils overlaid the basal lamina of seminiferous tubules in the testis of domestic fowl [13]. The pericellular myoid cells played an important role in spermiogenesis which promotes the progression of spermatozoa by secreting factors that induce proliferation and survival and also involved in the secretion of activating factors of sertoli cells [14].



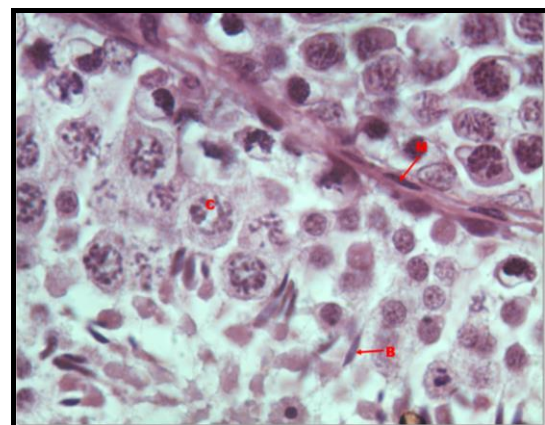
**Fig 1:** Seminiferous tubule of rabbit testis (H&E, 40X). A-Blood vessel, B-Spermatozoa, C-Intertubular connective tissue.



**Fig 2:** Seminiferous epithelium of rabbit testis (H&E, 100X). L-Leydig cell, G-Spermatogonia, C-Spermatocyte with mitotic division, T-Spermatid.



**Fig 3:** Seminiferous epithelium of rabbit testis (H&E, 100X). L-Leydig cell, S-Sertoli cell, G-Spermatogonia, C-Spermatocyte with mitotic division, T-Spermatid, M-Myoid cell.



**Fig 4:** Seminiferous epithelium of rabbit testis (H&E, 100X). B-Spermatozoa, C-Spermatocyte with mitotic division, M-Myoid cell.

#### 4. Conclusion

The testis of a rabbit was a compound tubular gland consisted of convoluted seminiferous tubules and surrounded by a dense connective tissue capsule. Numerous septa from the capsule divided the testicular parenchyma into numerous lobules. Each lobule contained the seminiferous tubules and Leydig cells. The seminiferous tubules were composed of various developing stages of spermatogenic cells and sertoli cells. The present study was undertaken to investigate post natal testicular histomorphology in Soviet Chinchilla rabbit as rabbits are widely used in biomedical research.

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