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Gross morphological study of Scottish cat testis at postnatal period: Kitten, adult, senior

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Abstract

In this study, fifteen male cats were used at postnatal stage (kitten, adult, senior) for gross morphological investigation. The results show that the testis of kittens was oval in shape and light pink in color that have attachment with the ventral abdominal wall, in adult the testis appeared oval in shape and yellowish-pink in color that suspended within scrotum at horizontal orientation. At the last age (senior) the testis appeared round to oval in shape with pale yellow in color that was completely suspended. The internal structure by using dissecting microscope show that the testis was composed of well-defined testicular lobe that occupied the seminiferous tubules, the seminiferous tubules were connected with the rete testis and with the mediastinum.

Keywords: Testis, cat, testicular lobe, color

Introduction

Behaviorally, Scottish Folds exhibit moderate sociability, engaging in playful activities such as fetch but without excessive restlessness. From a grooming perspective, the breed requires minimal maintenance. Short-haired varieties need weekly brushing to manage shedding, while long-haired types require more frequent grooming to prevent matting (Takeuchi and Mori, 2009; Mohammed, 2018) ^[1, 14]. The testis contains germ cells at various stages of development in the seminiferous tubules, which are supported both structurally and functionally by Sertoli cells and peritubular myoid cells, which help organize the tubular wall. Leydig cells are located in the interstitial tissue, where they play a critical role in androgen production, specifically testosterone, and its secretion (Sadler and Skinner, 2014; Crowley *et al.*, 2020) ^[2, 11]. A series of enclosures of the testis exists. Membranous capsules are as follows: The tunica vaginalis is a thin white membrane, the extension or evagination of the abdominal peritoneum. Passing through the inguinal canal to the end of the scrotum. A testis is made of two layers: the parietal layer, which borders the scrotum and thus is part of the scrotum, and the visceral layer, covering the spermatic cord, testis, and epididymis (Shakweer, 2015; Tsili *et al.*, 2018; Yang *et al.*, 2018) ^[3, 13].

Materials and Methods

For gross morphological disruption of scotch cat testis, we used fifty male cats (5 kitten, 5 Adult, 5 Senior). And then anesthetized these animals by intramuscular injection of ketamine and xylazine, after complete fixed the animal on anatomical board and make longitudinal incision on the scrotum to get the testis. The morphological parameters were recorded (Length, weight, thickness, width) by using the electron Vernia and sensitive balance (Liu *et al.*, 2010) ^[9]. The shape and color were recorded and take photographed (Schindala, 1999) ^[10].

Results and Discussion

General Structure of the Reproductive Tract in Male Cats

The reproductive tract of the tom cat consists of the penis, two testicles, the scrotum, the prostate gland, two bulbourethral glands (Cowper's glands), the epididymis, the ductus deferens (also called the vas deferens), the spermatic cords, and the urethra.

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The scrotum is a pouch divided by a thin wall into two cavities, each of which is occupied by a testicle, an epididymis, and the tail end of the spermatic cord. The skin of the scrotum is covered with dense hair. The dartos of the scrotum is a layer of tissue that lies just under the skin and is composed of muscle and other connective tissue. Under the dartos is connective tissue that lines the scrotum. Each testicle is round to oval in shape. The testicles contain seminiferous tubules that manufacture sperm. Johnson (2022) ^[4] reports that the testicles are located within a thin scrotum ventral to the anus. Each testicle is separated within the scrotum by a median septum comprised of fibrous connective tissue that divides the scrotum in half. The testicles are more round than oval in shape. That was similar to the finding in the result.

The epididymis consists of an elongated structure composed of a long, convoluted or twisted tube. It begins at the front end of the testicle and is positioned along the edge of the testicle. The deferent ducts are thin muscular tubes that are made up of three layers of muscle. The epididymis components (head, body and tail) were easily identified due to their well development. The head of the epididymis (Caput epididymis), was very coiled and covered with adipose tissue being continued through the epididymis body ventrally positioned by deferent ducts. (Stan, 2015) ^[5], our results were in agreement with that finding.

Morphological results (shape, color, location)

The morphological results show the testis of a kitten (2 months) appeared oval in shape with lightly pink in color. The scrotum was suspended, and it was attached to the ventral abdominal wall. At the same time, in the adult male cat (9 months), the testis appears oval in shape, like that in the kitten, with a yellowish-pink color. Still, it was suspended by the scrotum and located ventrally to the abdominal wall in a horizontal direction without attachment to the abdominal wall. In a senior male cat (4years), the testis was round to oval in shape with yellow-pale in color, and it was suspended by the scrotum freely (without any attachment) and horizontally in direction. In the wild feline species, the scrotal septum separates the paired testes. With an ovoid shape and rounded contours, they presented a concave border laterally and a straight border positioned medially. They were covered by a fibrous outer membrane of a whitish-pink color, known as the visceral vaginal tunic. (Machado *et al.*, 2020) ^[6]. this finding was in disagreement with the study results (fig. 1, 3, 5).

The testicles are located within a thin scrotum that extends from the ventral to the anus. Both testicles are located within the scrotum, separated by a median septum that divides the scrotum into two halves and is composed of fibrous connective tissue. The shape of the testicles is more round than oval. (Johnson, 2022) ^[4] this finding was in agreement with the study results. In dogs, the testes are lodged within the scrotum, which is located approximately two-thirds of the distance from the perpetual opening to the anus. It was situated between the thighs and had a spherical shape, indented in an oblique cranio-caudal direction by an indistinct raphe scroti. The left testis was usually farther caudad than the right, which allowed the surfaces of the testes to glide on each other more easily and with less pressure. The long axis of the testis ran dorso-caudal to the long axis of the body. (Kumar *et al.*, 2023) ^[7] this finding was in disagreement with the study results.

Internal structure of the testis

From the internal surface, the testis consisted of several seminiferous tubules supported by interstitial tissue with the rete testis and mediastinum. The epididymis is attached to the testis and consists of three parts: head, body, and tail. Heyn *et al.*, (1996) The internal structure of the cat testis features a dense fibroconnective tunica albuginea, septa dividing the parenchyma, and a rich interstitial with fine collagen bundles outlining seminiferous tubules, alongside a complex arrangement of collagen forming lacunar spaces for Leydig cells. This finding was in agreement with the study results. The internal structure of the cat's testis includes a tunica albuginea comprising 19% of the testis, seminiferous tubule volume density of approximately 90%, and Leydig cell volume density of about 6%, with a mean tubular diameter of 220 μ m. (França and Godinho, 2003). This finding was in disagreement with the study results (fig. 2, 4, 6).

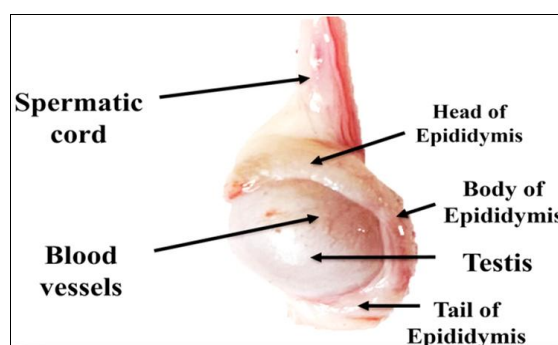


Fig 1: Cross photo macrograph of the testis in the Scottish cat at (2months) show: head of epididymis, Body of Epididymis, tail of epididymis, Testis, Spermatic cord, Blood vessels

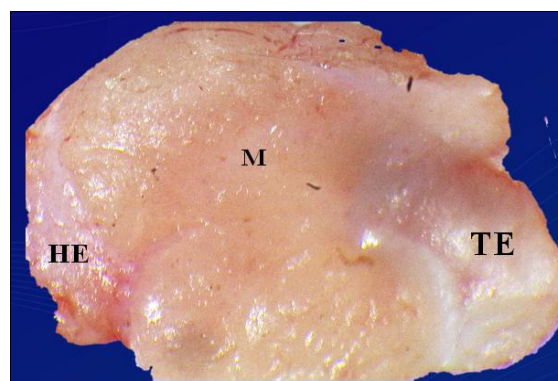


Fig 2: Cross photo macrograph of the testis in the Scottish cat at (2months) show: head of epididymis (HE), mediastinum (M), tail of epididymis. X8

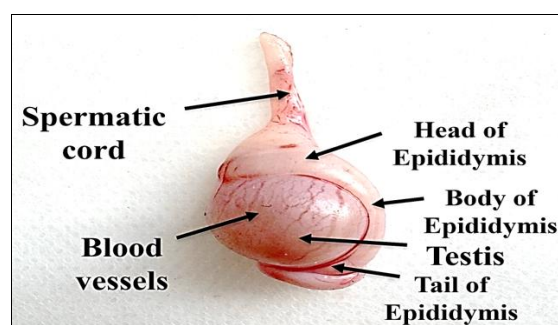


Fig 3: Cross photo macrograph of the testis in the Scottish cat at (9months) show: head of epididymis, Body of Epididymis, tail of epididymis, Testis, Spermatic cord, Blood vessels

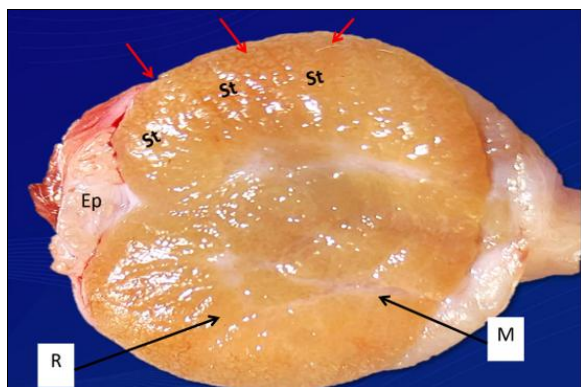


Fig 4: Cross photo macrograph of the testis in the Scottish cat at (9months) show: epididymis (ED), mediastinum (M), seminiferous tubule (St), rete testis(R). X8

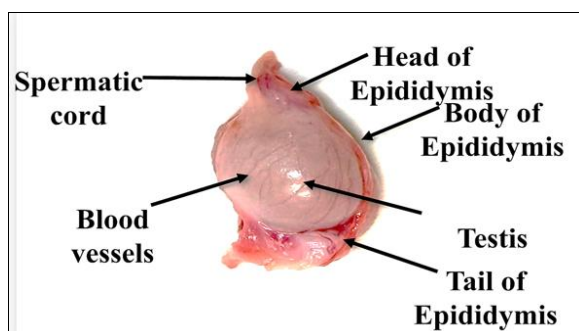


Fig 5: Cross photo macrograph of the testis in the Scottish cat at (4years) show: head of epididymis, Body of Epididymis, tail of epididymis, Testis, Spermatic cord, Blood vessels

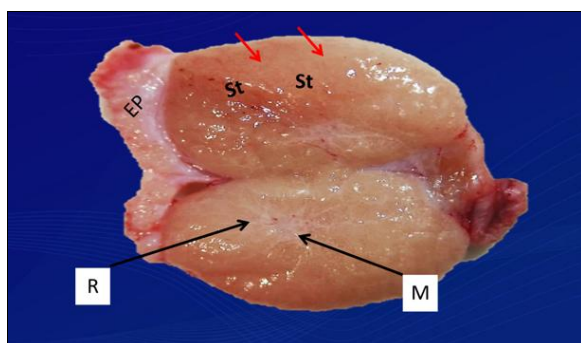


Fig 6: Cross photo macrograph of the testis in the Scottish cat at (4years) show: epididymis (ED), mediastinum (M), seminiferous tubule (St), rete testis(R)

Conflict of Interest

Not available

Financial Support

Not available

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