HISTOMORPHOLOG OF LIBYAN GOAT EPIDIDYMIS AND ITS changes due to SEASONAL VARIATIONS

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Abstract

The epididymal duct was examined by the light microscope in twelve sexually mature male goats in three regions, head, body, and tail. The layers of smooth muscle fibers surrounding the epididymal duct were decreased in number toward the tail, with thin connective tissue between tubules, and thick in the outer side. The pseudostratified columnar epithelium was higher in the body region. The taller cells in both head and body regions were supported with sterocilia gradually changed to low columnar and low cilia in the tail .There were morphological changes in the epithelium of the head and body regions of the epididymis due to seasonal variations and no changes were seen in the tail region

Introduction

Goats play an important role in animal production. It represents (14.5%) of the whole ruminants and 25-28% of Asia and Africa ruminants (FAO, 1978). In Libya, great attention has been given toward

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raising goats (1.5million) and improving its production (Shriha and Gadery, 2001).

The male goat has a high reproductive ability and has played an important role in good genetic characters than female (Derwish, 1986).

The morphology of epididymis is considered an important structure in endocrinology and reproductive research (Breazile, et al 1971) and this makes it imperative that the normal structure and function of relevant organs must be thoroughly investigated and used as a basis for further research.

The breeding season varies according to the weather and countries, it is either short or long (Mishra and Biswas, 1966).

The present study is designed to determine the normal structure in different seasons of twelve normal sexually mature goats.

Materials and Methods

Twelve normal healthy, sexually mature male goats were slaughtered, three in every season. The testes and epididymis were profused quickly with normal saline, then the epididymis was dissected carefully into: head, body and tail regions and fixed with 10% formalin for at least twenty four hours.

Tissues were fixed in formalin fluid and were processed by the usual paraffin method, cut into(5-7) μm sections and stained with HE (Hematoxylen and eosin) and Van Gieson's stain (Luna, 1960) to distinguish between smooth muscle fibers from collagen fiber.

Thickness of the connective tissue, height of the epithelial cells, and diameter of the lumen of the epididymal duct were measured by using an ocular micrometer fitted in the 10^x eye-piece. In each section only

those ducts which were circular or near circular, in profile were measured ensuring that an accurate cross-section of the duct was assessed and the cells were close to their true maximum height.

All tissue parameters were assessed by viewing (4) randomly chosen areas of each epididymal region (head, body, tail) per section of tissue.

Results

The epididymis was adhered to the testis and curved over the cranial pole and continued by the body along the caudomedial surface to the caudal pole of the testis. The tail was large and projects distally from the caudal pole.

Histologically the epididymis consist of a series of ducts which were surrounded by a mount of loose connective tissue and layers of circular smooth muscle fibers which appeared yellow in color with Van Gieson's stain and the number of the smooth muscle fibers were decreased significantly toward the tail of the epididymis (Fig 4). The connective tissue linked the tubes with each other and to the testicular capsule or tunica albuginea. The connective tissue appeared red in color with Van Gieson's stain (Fig 1), the thickness was about $(\mp 318.5 \mu m)$ in the head, in the body and $(\mp 147\ \mu m)$ $(\mp 369.61 \mu m)$ in the tail.

The thickness of the connective tissue between the tubules in the head and body regions was $(\mp 13.5 \mu m)$ and in tail was between $(\mp 120 \mu m)$

The diameter of the lumen in the head, body, and tail, was $8 - 10 \mu m$, $(\mp 163\ \mu m)$ and $(\mp 390 \mu m)$ respectively.

The ductus epididymis lines by pseudostratified columnar epithelium. In the head region the height of the taller cells was $(\mp 27 \mu m)$ with ovoid nucleus with a diameter of $(\mp 6 \mu m)$.

The spherical or ovoid nuclei of the basal cells were $(\mp 3.75 \mu m)$.

The apical surface of the columnar cells bored sterocilia. They have positive reaction with both stains $(\mp 24 \mu m)$, $12 - 27 \mu m$ length (Fig 2).

In the body region the epithelium is higher than that of the head, the taller cells measured $(+42\mu m)$ with a nucleus $(\mp 9\mu m)$, the sterocilia were ranged between and the nucleus of the basal cell $(\mp 6\mu m)$.
The epithelium of the body of the epididymis contains vesicular intraepithelial glands. Occasionally the lumen of the glands were seen filled with secretary mass and surrounded with simple cuboidal or flat cells. (Fig 3)

Discussion:

The thickness of the connective tissue which links the ductus epididymis to the testicular capsule was increased toward the tail, and the layers of the circular smooth muscle fibers were decreased toward the tail region. These results are in accordance with the observations of Breazile (et al 1971) and Al-Latif et al (2000) in the epididymis of sheep, and disagreement with Dellman and Brown (1981) in the goat, the number of circular smooth muscle fibers increase significantly toward the tail. In other animals, the circular disposed layers of smooth muscle fibers increased in thickness toward the tail of the epididymis as reported by (Goyal and Dhingre 1975) in bufflo and (Singh and Bharadwdj 1980) in the camel.

The connective tissue between the tubules was decreased in thickness due to the increase in the diameter of the lumen in the tail region.

The height of the epithelia of the body region of the epididymis was higher than that of the head due to the presence of the intraepithelial glands while it was absent in the other ruminants (Trautmann and Fiebiger 1957). In camel intraepithelial glands are present in head and body regions (Singh and Bharaddwaj1980) and the spermatozoa are

concentrated within the epididymal duct because greater quantities of fluid are more absorbed than secreted (Breazile, et al 1971).

In rats the epithelium of middle segment of the duct is generally lower than that of the initial segment and the microvilli are also shorter than that of the initial segment as observed by (OKE, et al 1989).

The epithelia of the tail region of the goat are low, and they appear similar to that of the sheep (AL-Latiff et al 2002).

The morphological changes in the epithelium of the Libyan goat epididymis are due to seasonal variations as observed in camel (Singh and Bharadwaj 1980). The increasing in epithelial height is due to a high level secretion of androgen (Currie, 1988) as indicated a strong positive reaction of eosin (Mohammed, & AL-Latif, 1997).

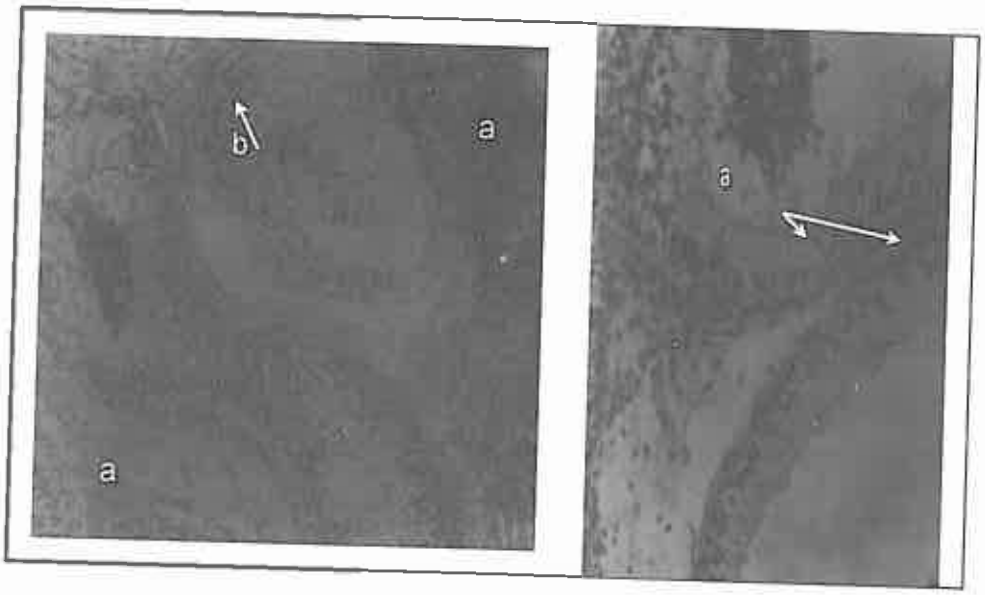

Fig. (1) Head of epididymis. Van Gasin stain 10×10

a. connective tissue **b. taller cells**

Fig. (2) Head of epididymis HE stain 25×10

a. sterocilia

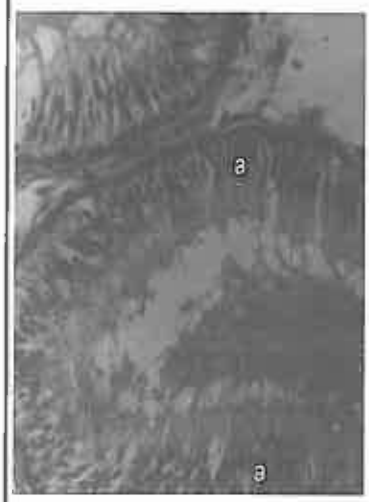

Fig. (5) Head of epididymis HE stain 10×10

Fig. (3) Body of epididymis HE stain 25×10

a. Vesicular intraepithelial gland

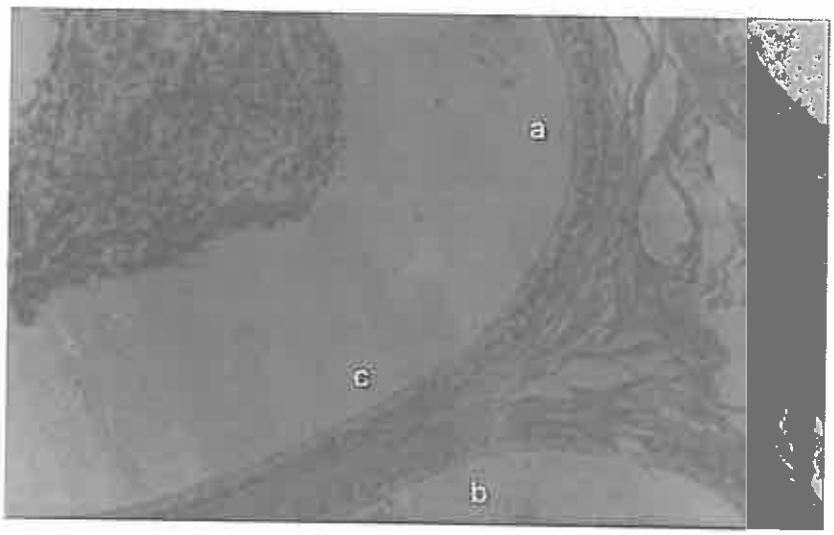

Fig. (4) Tail of epididymis. Van Gasin stain 10×25

a. Low columnar cells **b. Small amount of connective tissue**

c. Low number of circular smooth muscle fibers

الخلاصة:

تم فحص بربخ الماعز الليبي بالمجهر الضوئي في ثلاث مناطق هي الرأس و الجسم و الذيل و استخدمت اثنى عشر من الذكور البالغة جنسيا. فظهرت الطبقات العضلية الملساء اقل في منطقة ذيل البربخ مع ظهور كمية قليلة من النسيج الرابط بين القنوات و سميكة خارجه. و كانت الظهارة العمودية الكاذبة التطبق مرتفعة في منطقة الجسم و الخلايا الطويلة في منطقتي الرأس و الجسم تحمل اهدابا ثابتة تتحول تدريجيا الى خلايا مكعبة تحمل اهدابا واطنة في منطقة ذيل البربخ كما ظهرت تغيرات شكلية في ظهارة رأس البربخ و جسمه بسبب التغيرات الفصلية و لم تظهر تغيرات في ظهارة ذيل البربخ.

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