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Histological studies on the ovary and uterus of Black Bengal Goat

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Abstract

The present study was conducted in the department of anatomy, histology and embryology, faculty of veterinary and animal sciences, west Bengal University of animal fishery science, Kolkata. Total 15 specimens of adult black Bengal goat were collected from different slaughter house of Kolkata. After slaughter of animals the samples were collected and brought to the departmental laboratory for histological study. Female genitalia comprised of ovaries, fallopian tube, horn of the uterus, vagina and vestibules. There were two ovaries and each of them was found to be oval shaped and pale in colour situated in the corresponding abdominal cavity behind the kidneys and supported by the broad ligament named utero- ovarian ligament. Broad ligament was attached to the lesser curvature of the horn. All the above mentioned findings may be utilized by the physiologist, embryo-transfer technologist, animal breeder and other related workers for the development of the goatery husbandry.

Keywords: Histology, Black Bengal goat, Ovary and Uterus

Introduction

Goat is the first domesticated animal for food purpose. Domestication of goat took place about 10,000 years ago in the mountains of west Asia. Goat is small, sturdy and easily adaptable animal and is the species of food animal having widest distribution over the globe. The animal husbandry practice is mainly dependent upon the reproductive performances of the species consumed because highly variable structural differences are encountered particularly in the female reproductive systems among the domestic animals. It is therefore become matters of prime importance to study the structural organization of the female genitalia of a particular species.

Goat meat has no religious bar in all sections of society, also goat meat has less fat which is desirable feather liked by man. Goat meat has ready market due to heavy demand. So the reproduction is outcome of a coordinated series of physiological phenomenon in male and the female goat. For reproduction of animal the detailed knowledge of gross anatomical disposition on varies components of female genitalia of Black Bengal goat is required. The female reproductive system includes two ovaries, two uterine tubes (fallopian tubes or oviduct), uterus, vagina and vulva. The oviduct has three parts as isthmus, ampulla and infundibulum. The uterus consists of two horns, a body and cervix. The vagina extends from uterus to vulva. Vulva consists of two labia, vestibules, clitoris. The ovum is expelled from the ovary and received by the infundibulum and carried to the uterine tube where fertilization normally occurs. The result of this investigation will certainly be a useful tool to the animal physiologist and breeders for better understanding and functional aspects of all these organs in this animal under normal as well as altered physiological condition.

Materials and method

The present study was conducted in the department of Anatomy, Histology and Embryology, Faculty of Veterinary and Animal Sciences, West Bengal University of Animal Fishery Science Kolkata.

(A) Collection of specimen

Total 15 specimens of adult Black Bengal goat were collected from different slaughter house of Kolkata. After slaughter of animal, the samples were collected and brought to the departmental laboratory for detailed study.

(B) Processing of tissue for Histological study

For histological slide preparation different parts of female genitalia of black Bengal goat were collected in small pieces (4-6 mm thick). The small pieces were kept in 10% neutral buffered Formalin. Small tissues of ovary, fallopian tube, uterus and vagina were taken from the sample of specimen. The specimens after fixation for 24 hours were washed under water for 12 hours. Then tissues were passed in ascending grades of alcohol (1 hour each) for dehydration. Afterward the tissues were kept in half an hour of absolute alcohol and cedar wood oil for 7 days. Tissues were taken out and kept in small cubicle in xylene for 10 minutes for removing of cedar wood oil. The tissues were kept in melting paraffin at the temperature 58^o to 60^oC. The tissues were changed into three melting paraffin in a paraffin bath for two hour each for three changes. Afterwards blocks were prepared in paraffin by standard procedure. Thin sections (5 μ) were cut with the help of Rotary microtome. The sections were deparaffinised in Xylene and stained with Haematoxylin and Eosin as per routine method. Harris Haematoxylin (1900) was used in the staining procedure. Photomicrographs were made under light microscope and in various magnifications of the luminal surface of horn, stereoscopic microscope was used.

Results and Discussion

Histological organization of various tissues of ovary and uterus of Black Bengal goat has been studied in this investigation. The results have been presented under the following headings:

Ovary

The ovaries represented the two distinct zone, outer cortex and inner medulla. The ovary was covered by the germinal epithelium. Ovarian follicles in various stages of development were found in the cortical zone, could be seen some large follicles with or without ovum.

Mature graffian follicle clearly identified in the histological slide (Fig. 1). The blood vessels, nerves and lymphatics were found. These findings are in agreement with the Bacha *et al.*, (2000) [1], Banks *et al.*, (1981) [3], Dellmann *et al.*, (1998) [4], Banerjee (1998) [2], Frandson *et al.*, (1992) [5] who have stated that ovary had outer cortex and inner medulla. In the cortical portion ovary contained more number of ovarian follicles. In the medullary portion there was loose connective tissue, nerve fibres and lymphatics.

Uterus

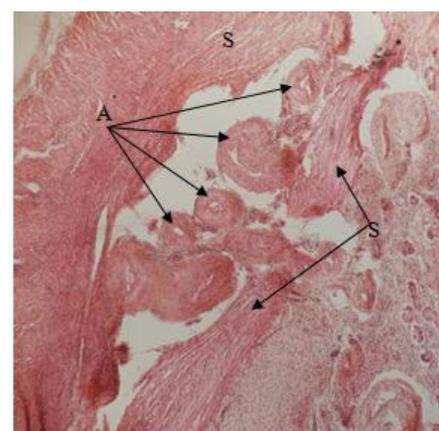
The uterus was composed by the three layer- inner mucosa; endometrium, middle muscular; myometrium and outer serosa; perimetrium. The Endometrium was highly infolded and closed to the centre of lumen. The lamina mucosa was simple columnar epithelium. The Endometrial glands were seen in the slide (Fig. 2). The Myometrium was thick and consisted of smooth muscle fibers (Fig. 2, 3). The muscular fibres were arranged in inner circular and outer longitudinal layer. The Perimetrium was closely attached to the myometrium (Fig. 3). This attachment was made by a thin layer of elastic fibres. Perimetrium contained muscle cells, blood vessels and lymph. The uterine duct was clearly identified in the histological slide of top of the horn, middle and base of uterus. The findings are in agreement with those of Nickel *et al.*, (1973) [6], Frandson *et al.*, (1992) [5] and Bacha *et al.*, (2000) [1] who have also described that numerous branched uterine glands were situated below the epithelium

and the glands were very vascular and cellular containing reticular like connective tissues. Bacha *et al.*, (2000) [1] described that endometrium of uterus was stratified or pseudostratified. Frandson *et al.*, (1992) [5] stated that uterine glands were simple, branched, lobular glands. The myometrium was thick and consisted of bundles of smooth muscle fibres. The muscular fibres are arranged in inner circular and outer longitudinal. These present findings are similar to the findings of Nickel *et al.*, (1973) [6]. Frandson *et al.*, (1992) [5] stated that myometrium consisted of a thick inner circular layer and thinner outer longitudinal layer of smooth muscle. The longitudinal layer was continuous with the smooth muscles in the mesometrium. Frandson *et al.*, (1992) [5] described that myometrium consisted of thick inner circular of smooth muscles, separated from each other by a vascular layer. Peritoneum was closely attached to the myometrium. This attachment was made by a thin layer of elastic fibers. Peritoneum contained muscle cells, vessels and nerves. This is in agreement with Nickel *et al.*, (1973) [6]. Frandson *et al.*, (1992) [5] mentioned that peritoneum was continuous with broad ligament.



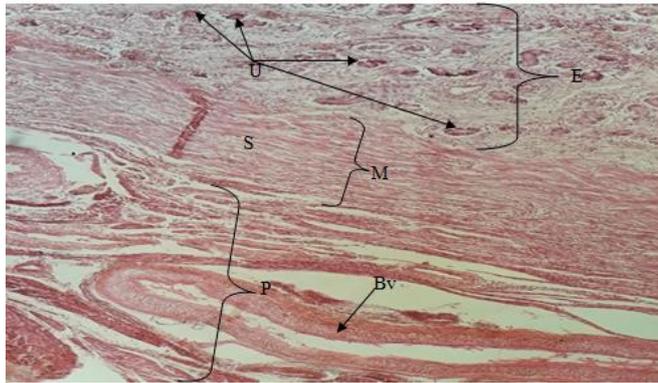
H & E X10

Photomicrograph 1: Histology of ovary showing Primary oocyte (Po) and mature Graffian follicle (Gf) in the cortex (outer).



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Photomicrograph 2: Histology of uterus showing arteries (A) and Smooth muscle fibers in myometrium (S).



H & E X10

Photomicrograph 3: Histology of uterus showing uterine glands (U) in endometrium (E), Smooth muscle fibers in myometrium (M) and perimetrium (P) containing large blood vessel (Bv).

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