

# Morphological and Histological of Ovary in Domestic Iraqi Sheep *Ovis aries*

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**Abstract:** Present study were carried out on Twenty adult local sheep (ewes). The results were showed that the ovaries of adult sheep are small, oval to almond shaped. They are paired organs located on either side of the uterus within the broad ligament below the uterine (fallopian) tubes, the statistical analysis results revealed no significant differences at level  $P \leq 0.05$  between each of the length and width of the ovaries left and right while the thicknesses showed a significant difference between the ovaries. Histological structure consist of epithelium – surface layer, tunica albuginea, connective tissue covering the entire ovary cortex beneath tunica albuginea, the cortex contains follicles in various stages of development (primordial follicles – contain a single oocyte surrounded by a single layer of granulosa cells most immature follicle found in the ovarian cortex, Primary follicle surrounded by a single layer of granulosa cells, Secondary follicle, contain two or more layers of granulosa cells. Tertiary follicle (n) fluid filled follicle visible on surface of the ovary in most species. Typically have an antrum, which is a fluid filled cavity., growing follicles, vesicular follicles and atretic follicles. The medulla has loose connective tissue and blood vessels.

**Keywords:** Infection; Intestinal parasites; prevalence; Stool; Giardia Lamblia; Riyadh Saudi Arabia

## 1. Introduction

Domestic sheep *Ovis aries* is a quadrupedal, ruminant mammal typically kept as livestock. Like all ruminants, sheep are members of the order Artiodactyla, the even-toed ungulates. Although the name "sheep" applies to many species in the genus *Ovis*, in everyday usage it almost always refers to *Ovis aries*. Numbering a little over one billion, domestic sheep are also the most numerous species of sheep, an adult female sheep is referred to as a *ewe*, an intact male as a *ram* or occasionally a *tup*, a castrated male as a *wether*, and a younger sheep as a *lamb*. Sheep are widespread across the world, having adapted to many different climatic conditions and ecotones (Ryder, 1983). During the past 40 years, sheep have also been the subject of considerable research from the viewpoint of physiological function and animal production, are now regarded as one of the most studied non-human, non-rodent species, also have long been important to humans for their milk, meat, and wool (Scherf, 2000; Corbett, 1990).

The ovaries is a part of female reproductive system, which are homologous to the testes of the male, produce ova and the female sex hormones, estrogen and progesterone (Erickson, 1978). It's flattened spheroids or oval to round, located near the cranial pelvic opening (Dyce *et al.*, 2010; Shively, 1984).

The surface of an ovary is lined by a simple squamous serosal epithelium, it subtended by a layer of little vascularized, dense irregular connective tissue that forms the tunica albuginea, the ovary have two zones, cortex and medulla, the second zone is the medulla, which lies centrally within the ovary, surrounded by the cortex (Bloom and Fawcett, 1975).

The cortex consist of clusters of fibroblast cells, also known as stromal cells, and consist of interstitial gland cells and theca cells associated with follicular development. Most of the cortex consists of follicles, which are ova-bearing

structures, this follicles primordial, primary, secondary, growing and tertiary follicle, the tertiary follicles has complete development, it has become a mature follicle, ready to rupture and release the oocyte, a process called ovulation. The medulla consists of large blood vessels surrounded by loose connective tissue that contain sufficient amount of elastic and reticular fibers (Samuelson, 2007).

## 2. Materials and Methods

Twenty adult local sheep (ewes) were collected from slaughter house of Basra city used for this study after being examined the animal to detect any clinical diseases, ten specimens for anatomical study and ten for histological study. The laparotomy is done and the ovary was exposed from female reproductive system. A specimens of ovary were immediately measured the length, width and thicknesses of the two ovaries (left & right) by digital vernier calipers.

For histological study the specimens of ovary were immediately fixed for 24 hours in formalin solution then dehydrated with series of crescent concentration of ethyl alcohol and imbedded in paraffin wax then cutting by rotary microtome to 4-6 microns, later histological section were stained with hematoxylin and eosin (Luna, 1968).

## 3. Statistical Analysis

The results were analyzed statistically using Minitab program testing values using the significant difference  $P < 0.05$  test of SPSS.

## 4. Results and Discussion

The ovaries of adult sheep are small and oval to almond shaped. They are paired organs located on either side of the uterus within the broad ligament below the uterine (fallopian) tubes (Fig.1) agreement with (Katz *et al.*, 2007; Kyun, 2000; Henry, 1999 and Deutscher, 1980).

The present study of statistical analysis results revealed no significant differences at level  $P \leq 0.05$  between each of the length and width of the ovaries left and right while the thicknesses showed a significant difference  $P \leq 0.05$  between the ovaries according to (Table.1).

Comparatively a lower length for both right and left ovaries of goats was reported by (Islam *et al.*, 2007). However, a higher length was reported by (Mohammadpur, 2007) in Iranian native goat, (Adigwe and Fayemi, 2005) in Maradi goat of Nigeria (Sharma and Sharma, 2004) in Gaddy goats of India, respectively. A significant difference was found between the mean width of right and left ovaries Black Bengal Goat in (Gupta *et al.*, 2011). While the mean weight of the ovary recorded in the present study was lower than that of (Islam *et al.*, 2007).

May be the right ovary was wider and larger in length as compared to the left one which confirm the fact of right ovary being more active than the left one. These results have established the baseline dimensions of the different segments of the female reproductive tract of the Black Bengal goat and the information will help the diagnosis of various abnormalities (Dyce *et al.*, 2010). The differences between the results in this study and published results in goats might be due to breed differences, differences in size of reproductive tract may also be due to climatic effects as young goats in the tropics have to contend with the effects of the first dry season when growth may be seriously retarded, more work on other breeds, like the Jamnapari, cross breed, local and causes of differences between breeds and species seems important for better understanding of the reproduction in these animals according to table 1 (Kumar *et al.*, 2004).

Histologically, the ovary has two main sections: the outer cortex and inner medulla. Epithelium covering ovary, made of saquamous epithelial cells. Tunica albuginea Outer dense, collagenous connective tissue layer covering the entire ovary, which is continuous with the peritoneal lining. Consist of a single layer of cuboidal epithelial cells called the germinal epithelium, which serve to prevent adhesions and is broken at ovulation (Fig.2, 3) these result agreement with (William and Linda, 2000) in cattle.

The cortex is beneath tunica albuginea where the follicles and oocytes are found at various stages of development and

degeneration; it's made of tightly packed connective tissue. Occupies the greater part of the ovary. It's stroma is a primitive type of connective tissue (Fig. 2, 4 and 5).

The medulla is vasculature and primarily loose stromal tissue, contains blood vessels and connective tissue (Fig.3, 6) these result agreement with (Junqueira *et al.*, 1998) in sheep.

Numerous follicles in various stages of development are embedded in the stroma of the cortex, the most numerous are primordial follicles found in peripheral zone of the cortex just under the tunica albuginea, they are the smallest and simplest in structure surrounded by a single layer of granulosa cells (Fig.2, 7), primary follicles grow larger from resting individual primordial follicles, become cuboidal comprise a single surrounding layer (Fig.2, 5, 8 and 9). In various parts can be identified the theca surrounding the follicle into two portions an inner vascularized layer, the theca interna, and an outer fibrous connective tissue, the theca externa, the stratum granulosum or membrane granulosa, the large antrum filled with follicular fluid and the cumulus oophorus in which is embedded the ovum, smaller follicles with stratified follicular cells surrounding the ovum are growing follicles, the ovum is small in primary follicles then increases gradually in size in growing follicles (Fig.8). Secondary follicle they contain two or more layers of granulosa cells, oocyte continue to enlarge and forms zona pellucida (Fig.10). Tertiary follicle, fluid filled follicle visible on surface of the ovary typically have an antrum and forming cumulus oophorus (Fig.4), larger follicles with cavities of various sizes are termed vesicular follicles they are situated deeper in the cortex and are surrounded by connective tissue capsules (Fig.3), most of the follicles contain an ovum with its nucleus or germinal vesicle. An atretic follicle containing the remnants of a disintegrating ovum (Fig.10). These results are agreement with (Samuelson, 2007; Junqueira *et al.*, 1998).

**Table 1**

Parameters	Right ovary	Left ovary
Length	1.26±0.135 a	1.27±0.1418 a
Width	0.790±0.137a	0.84±0.0966 a
Thicknesses	0.460±0.0966 a	0.3±0.115b

$P \leq 0.05$  (The different litter represent the significant differences)

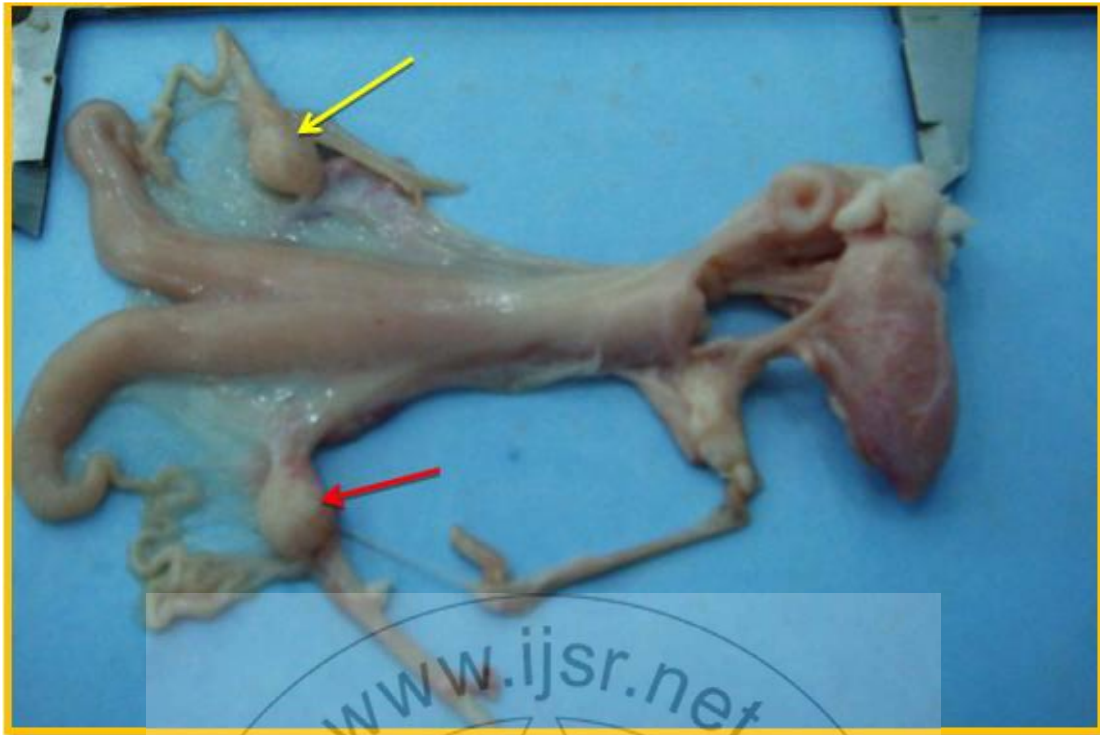


Figure 1: Show the ovary of female reproductive tract in the sheep.

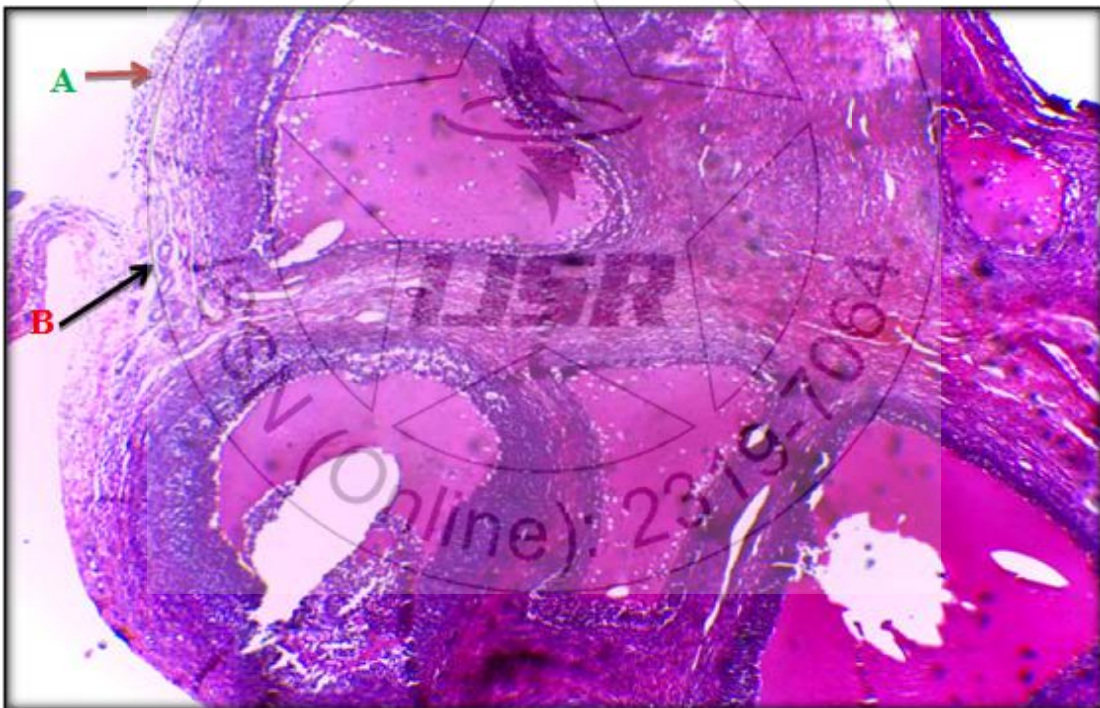
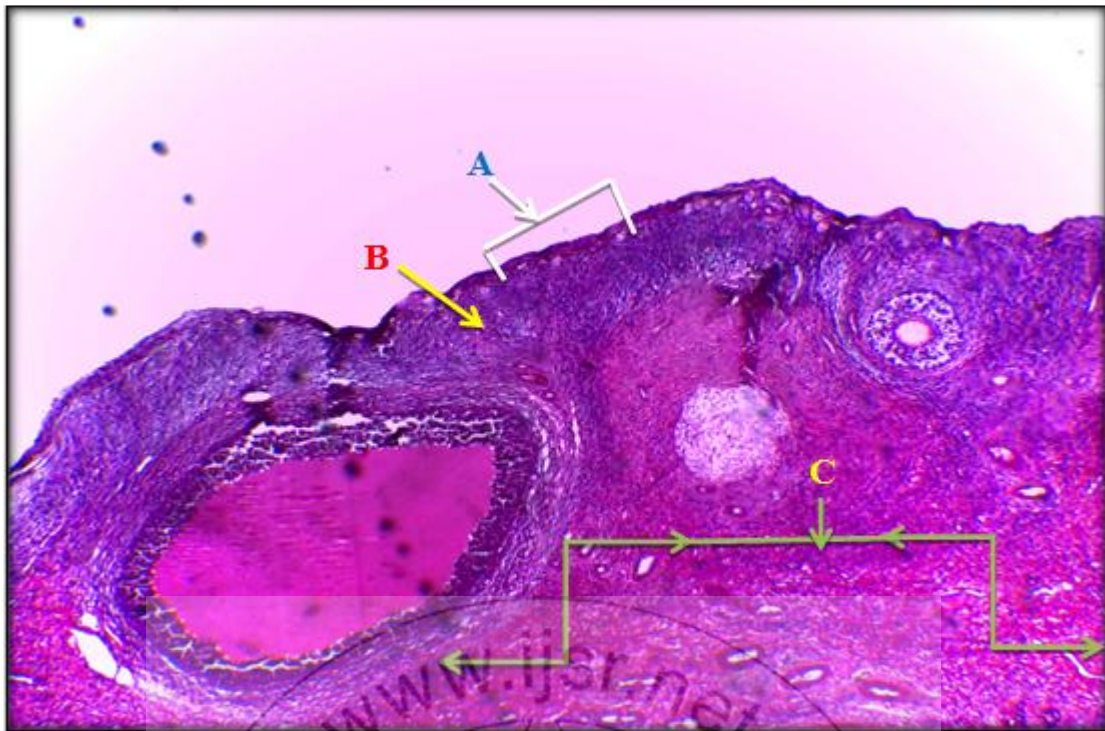
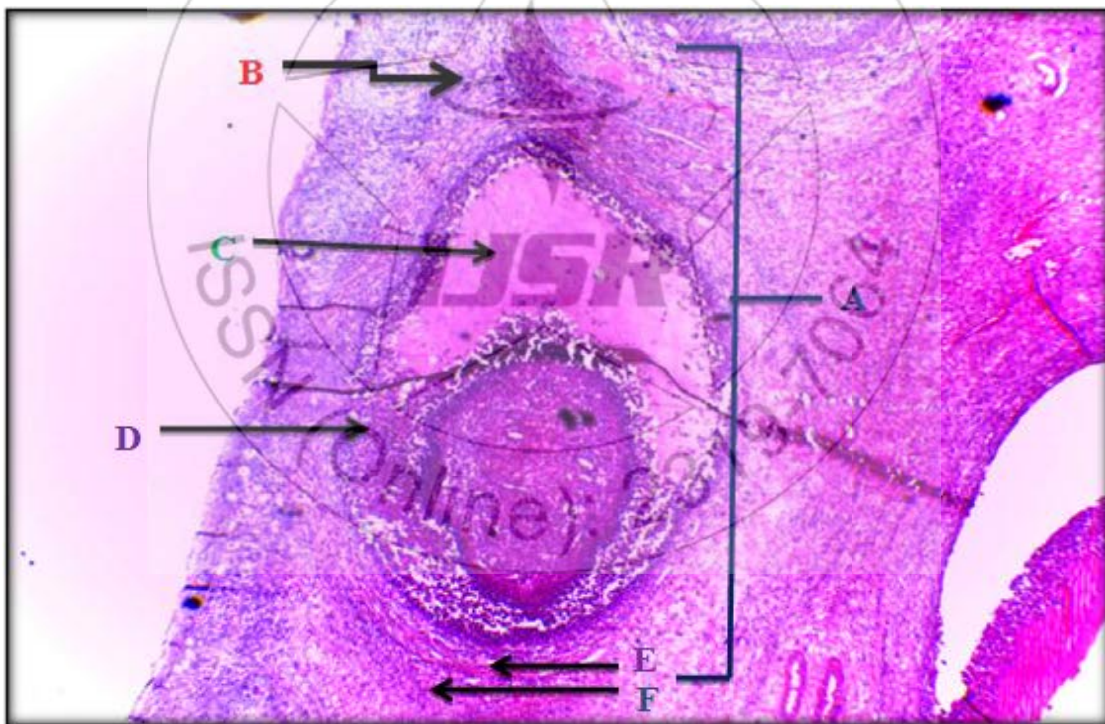


Figure 2: Photograph of ovary in the sheep show the: (A) Surface epithelium (B) cortical stroma with many primordial & primary follicles.



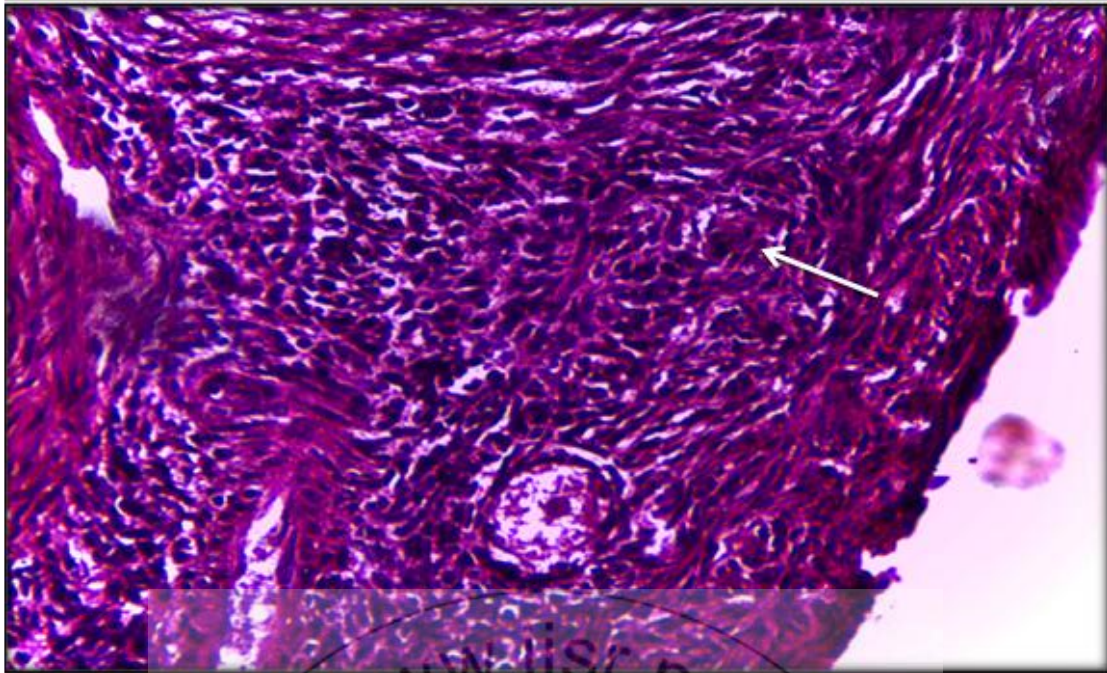


**Figure 3:** Photograph of ovary in the sheep show the: (A) Surface epithelium (B) tunica albugenia (C) ovarian medulla (zona vasculosa) (D) vesicular follicle.

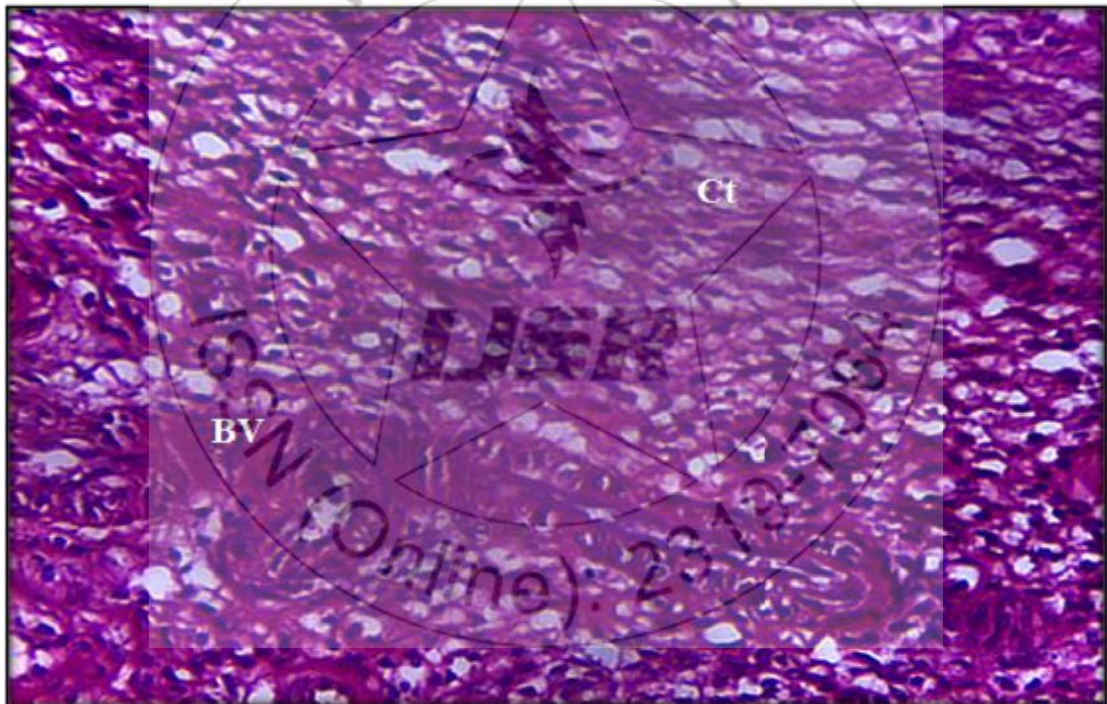


**Figure 4:** Photograph of ovary in the sheep show: the (A) Tertiary follicles (B) cortical stroma (C) beginning of follicular antrum (D) Granulosa oophorus with oocyte (E) theca folliculi interna (F) theca folliculi externa.



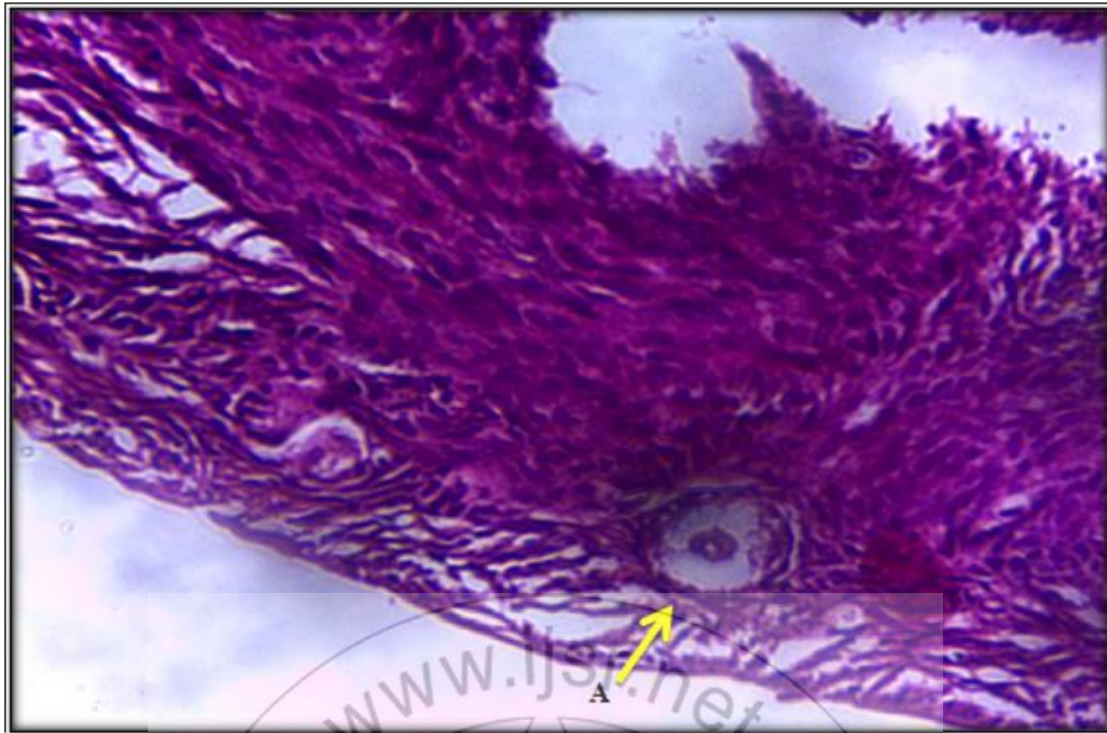


**Figure 5:** Photograph of ovary in the sheep show the cortical stroma.



**Figure 6:** Photograph of medulla in the ovary of sheep showed blood vessels & connective tissue



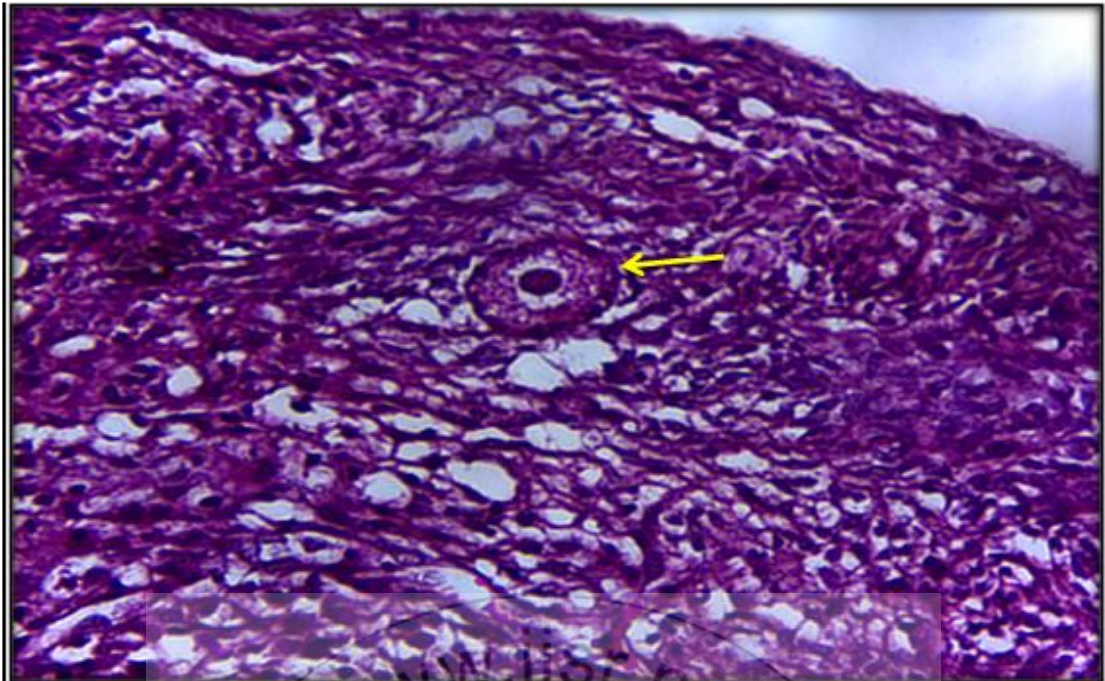


**Figure 7:** Photograph of ovary in the sheep show the: (A) Primordial follicles.

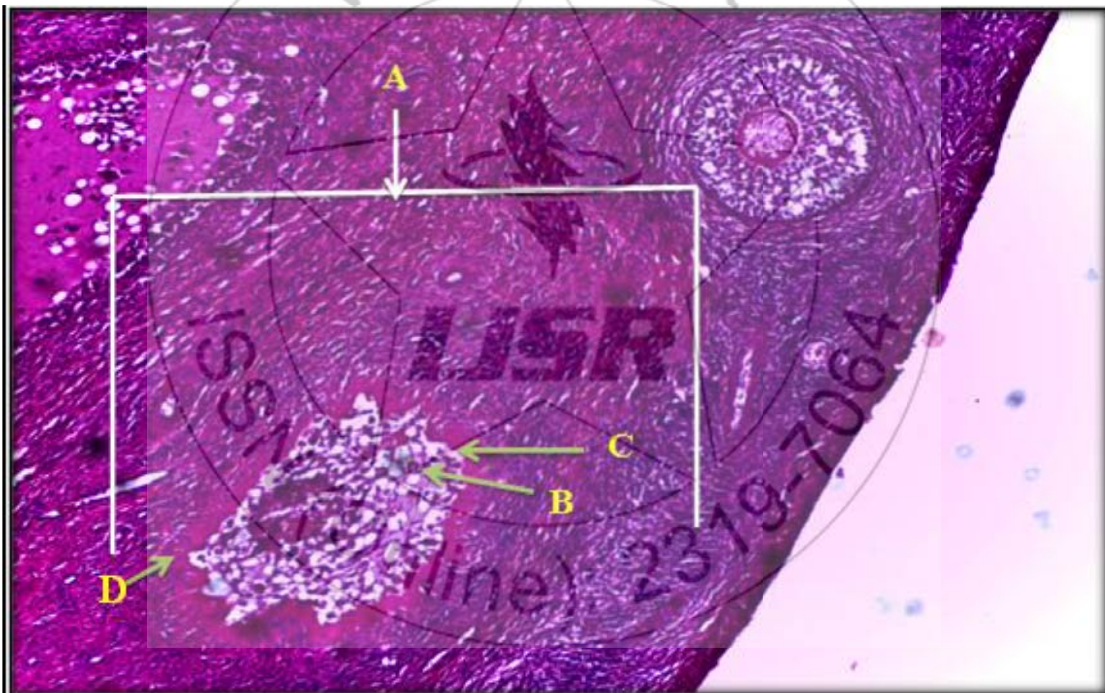


**Figure 8:** Photograph of ovary in the sheep show the: Primary follicles



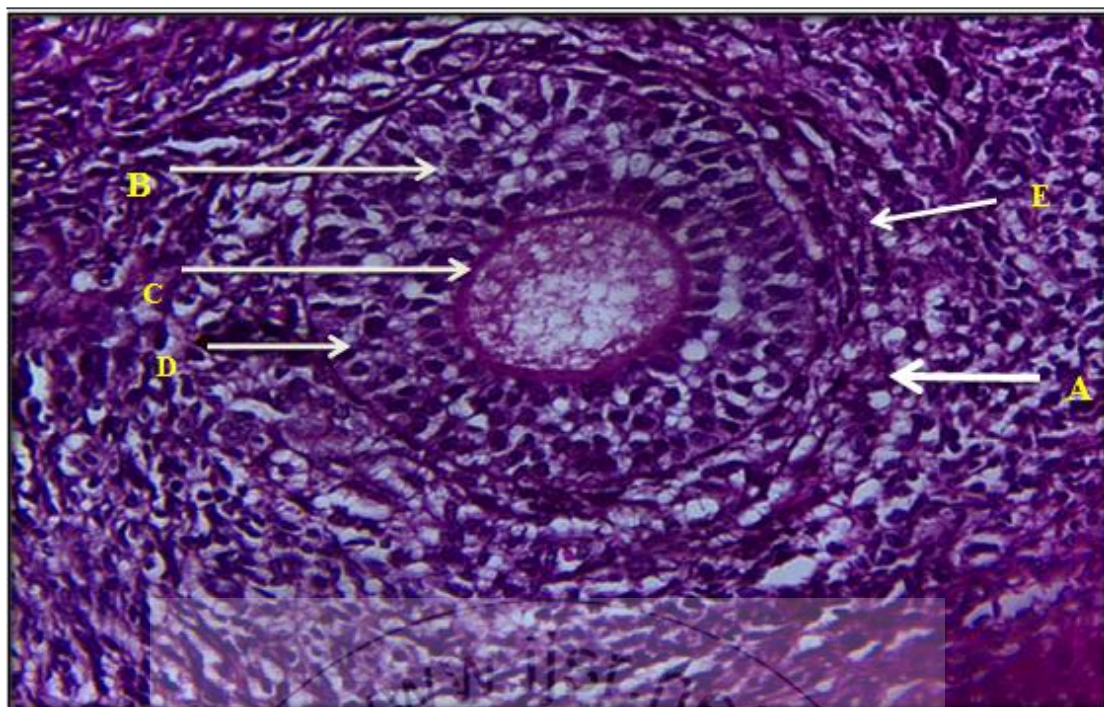


**Figure 9:** Photograph of ovary in the sheep show the: Primary follicles.



**Figure 10:** Photograph of ovary in the sheep show: the (A)Secondary follicles (B) follicular epithelium (C) zona pellucida (D)basal membrane (E) theca folliculi.





**Figure 11:** Photograph of ovary in the sheep show the: (A) Atretic follicles (B) external corpuscle (C) theca folliculi interna (D) theca folliculi externa

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