

## Short Communication

# Pathological Studies on Testes of the Ram

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## ABSTRACT

Pathological/biometric studies were carried out on the testes of 100 rams collected from local abattoir, Faisalabad, Pakistan. Testes from eleven (11%) rams showed various pathological conditions including orchitis (5.25% in immature and 6.45% in mature rams), unilateral hypoplasia (2.65% in immature rams), degeneration (3.2% in mature rams), cyst (1.61% in mature rams) and hypertrophy (1.61% in mature rams). The histological pictures confirmed the recorded gross pathological lesions.

**Key Words:** Rams; Testes; Pathology; Pakistan

## INTRODUCTION

Normal structure and functions of the male genital organs give better reproductive performance. The testis is the site of production of spermatozoa and male sex hormones. Therefore, any abnormality in testes leads to reproductive failure. The knowledge about pathology of genital organs is essential in diagnosis of infertility as well as in the treatment of other genital diseases. The common disease conditions affecting the testes are either congenital anomalies, including aplasia, hypoplasia and cryptorchidism or acquired such as tunica adhesions, calcinosis, orchitis, fibrosis, varicocele and other degenerative conditions. Such conditions may lead to reduced fertility, low productivity, longer service period and sterility (Samad *et al*, 1980).

The information on this vital aspect of ram has not so far attracted the attention of research workers in Pakistan, although a large number of studies have been carried out in other countries. The present study, therefore, has been designed as a pilot project to determine the pathological conditions of the ram's testes. It is hoped that information thus gained will provide an insight into the understanding of existing problems of male reproductive tract of our local ram population.

## MATERIALS AND METHODS

The research samples were taken from the Faisalabad abattoir and brought to the Department of Veterinary Pathology, the University of Agriculture Faisalabad, Pakistan for further studies. Testes were obtained of 100 Kajli rams of various age groups the Faisalabad abattoir.

Each testicle, left and right, after procurement was numbered, put in separate polythene bag brought to the laboratory as soon as possible and the testes were placed in

their natural position on the table top. The extraneous material including the fat and fascia were removed from each testicle before doing further examination. The apparently abnormal testes were separated and examined for disease conditions.

The prevalence of various pathological disease conditions of the testes were studied by gross and histological examinations. All the apparently present lesions were recorded and for histological study techniques described by Humason (1972) were followed. The data regarding the biometry of each left and right testis was tabulated and subjected to ANOVA using Mstat-c.

## RESULTS

Of the total 100 testes, 11 showed different abnormalities affecting either single or both testes. The prevalence of various pathological conditions is presented in Tables I and II.

**Orchitis.** The testes had congestion with prominence of blood vessels. There was accumulation of exudate in the tunica vaginalis which was haemorrhagic in acute cases and fibro-purulent in chronic cases, testicular size was increased in all rams. Microscopically, in acute case, neutrophils infiltration was seen in the tubulars lumen and in interstitial tissues. The capillary appeared to be more dilated; whereas, in chronic case, the testicular parenchyma showed focal of diffuse necrotic tissues surrounded by mononuclear cells comprising of lymphocytes, plasma cells and few macrophages.

**Hypoplasia/Atrophy.** One unilaterally hypoplastic testes was noted in immature rams. The testis was smaller in size, soft and 1/3<sup>rd</sup> of the normal testis. Microscopically, reduced seminiferous tubules in diameter, thickened basement membrane, with hyaline changes were seen. There was

**Table I. Age-wise distribution of normal and morbid testes (n=100)**

Age group	Normal	Abnormal	Total
Below one year	35 (92.1)	3 (7.9)	38 (38)
Above one year	54 (87.1)	8 (12.9)	62 (6)
Total	89 (89.0)	11 (11)	100 (100)

Figures in parenthesis indicate percentage

**Table II. Incidence and pathology of various disease conditions under different age groups**

Observed Pathology	Relative Incidence	< 1 Year (%)	> 1 Year (%)	Overall total incidence (%)
Orchitis	6 (54.5)	5.25	6.45	6
Degeneration	2(18.2)	–	3.22	2
Cyst	1(9.1)	–	1.61	1
Atrophy/Hypoplasia	1 (9.1)	2.65	–	1
Hypertrophy	1 (9.1)	–	1.61	1
Total	11 (100)	3 (7.9)	8 (12.9)	11

Figures in parenthesis indicate percentage

increase in peritubular connective tissue and interstitial cells appeared to be increased in number. The spermatocytes were vacuolated and fusion of spermatids produced intratubular giant cells.

**Testicular degeneration.** Two cases of testicular degeneration were recorded in mature rams. Grossly, the degenerative testes were hard and fibrous. The cut surface of such testis had granular appearance. Microscopically, cytoplasmic vacuolation, nuclear pyknosis, decreased thickness of germinal epithelium, intratubular giant cells formation were the salient features. Other changes included diminished tubular size and thickening of the basement membrane.

**Spermatocele.** A swollen, round cyst at the top of the head of the testes near epididymus was recorded in one mature animal. The cut surface showed cyst, filled with whitish caseative material. Histologically, many cysts were observed. The epididymal lumen showed extra vasation of sperms into the interstitial of the epididymus. The adjoining testicular tissues showed hypoplastic changes.

**Hypertrophy.** One case of hypertrophy of the testis was seen in mature rams. Grossly, the testis was enlarge and bigger than the counter part. Histologically, the cell's size was increased.

## DISCUSSION

The precise knowledge about normal structure and function of the testes helps to know their health status. Miller and Moule (1954) reported that 10.7% of all rams examined carried some genital defects, which includes epididymitis (6.3%), hypoplasia (1.3%), and varicocele (0.9%), which coincides with our observations. Khalimbekov *et al.* (1961) reported high prevalence of

orchitis and epididymitis compared with the results of current study. This difference could be due to the environmental, management practices, and/or breed differences. In the present study, grossly the testes were slightly enlarged showing congestion and prominence of blood vessels. Necrotic and degenerative changes along with mono-nuclear infiltration were present on histological examinations. These findings are congruent with those of Ladds *et al.* (1973) and Ladds (1985), who reported that in cattle, necrotizing orchitis caused by trauma presents a picture of coagulative necrosis along with fibrosis and mono-nuclear cells infiltration. Vrzulova (1981) reported that a pronounced redulication of the lamellar layer of the tubule was recorded in the rams with orchitis.

Testicular hypoplasia were reported lower (1.3%) by Miller and Moule (1954) than that in the present study. Grossly, the hypoplastic testes were smaller in size and were slightly firm. Histologically, examination revealed seminiferous tubules of reduced diameter, thickened basement membranes and increased peritubular connective tissues as has been stated by Ladds (1985). Similarly, Nascimento *et al.* (1981) reported that degenerative lesions were found in 76 (50.66%) in bulls. Grossly, the degenerative testes were hard and fibrous. Histologically, cytoplasmic vacuolation, nuclear pyknosis, decreased thickness of germinal epithelium, intratubular giant cells formation were seen. Ott *et al.* (1982) reported that testes of the rams showed congestion and varying degrees of degeneration of seminiferous tubules. Cross sectionally, tubules were showing frank degeneration. In the dorsal sample of the left testis, 5% of the tubules were degenerated, in the middle 4% and in ventral sample 2%. In the right testis, the comparable percentages were higher 23, 26 and 11%, respectively. Vrzulova (1981) stated that degenerative testes of the ram showed severe changes in the general and sertoli cells particularly, characterized by generalized vacuolization of cell cytoplasm accompanied by cell karyolysis. The sertoli cells showed lipid and glycogen deposition.

Spermatocele was observed in only one (1.60%) mature ram. These findings almost coincide with Chaudhuri *et al.* (1983) who recorded 1.52% cases of spermatocele in buffaloes bulls. In cow bulls, Blom and Christensen (1960) recorded 1.5% of spermatocele, which also coincide with our observations. However, Ladds *et al.* (1973) and Kumi-Diaka (1979) reported higher incidences than all the findings. This difference could be due to species, nutritional and environmental factors which contribute for this disease. Grossly, the affected part of the testes was swollen, accompanied with slight testicular atrophy. Histologically, many cysts of microscopic size were present, while adjoining testicular tissues showed atrophic changes.

Hypertrophy of one testis (1.6%) of mature ram was seen. Grossly, the testis was large in size than the other. Histologically, cells were larger in size and parenchyma was thickened. This increase in the size of the testis may be due

to breeding seasons or a abnormal disturbance. Thomas *et al.* (1983) reported that hypertrophy most often was physiological phenomenon, but in some instances might be pathologic. His findings are almost in agreement with our findings; while Wijanans (1953) reported that hypertrophy in rams partly dependent on a reflex increase of pituitary follicle stimulating hormone.

## CONCLUSION

It is concluded that age is major factor in genital diseases of the ram. The prevalence and severity of Orchitis was more in the mature rams as compared to the immature ones. Similarly, degeneration was only found in the former group. Hypoplasia was, however, only seen in the immature rams. Further studies on larger scale are recommended.

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