

Pathology of the Ovaries and Reproductive Tract in Cystic Ovarian Degeneration in Murrah Buffalo

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ABSTRACT

Cystic ovaries in buffalo were classified into follicular cyst and luteal cyst. The follicular cyst was characterized by a thin or thick layer of connective tissue capsule around a degenerating layer of granulosa cells with excessive follicular fluid and absence of oocyte. The changes observed in reproductive tract revealed severe hyperemia and cystic glands in the uterus. Active mucus secreting cells were seen in cervix. The luteal cyst was characterized by a thick layer of connective tissue around a thin or thick layer of lutein cells. At the centre of the cyst, was found, varying amount of fluid. The oviduct revealed no significant lesions but the endometrium showed extensive edema with the resultant pressure atrophy of the uterine glands. Few of the glands were cystic. The cervix did not reveal any distinct lesion.

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INTRODUCTION

Cystic ovarian degeneration (COD), though not of a common occurrence in buffaloes, is a serious ovarian disease associated with hormonal imbalance. The need to study this condition is very vital, as the pathological state affects high milk yielding and valuable buffaloes, which in most cases become infertile due to COD.

The incidence of COD in Indian buffaloes have been reported mostly on the basis of clinical findings and slaughter house material by several workers. (Polding and Lal, 1954; Jalnapurkar, 1965; Gujarathi, 1966; Rao and Keshavamurthy, 1971; Dwivedi and Singh, 1971; Luktuke and Arora, 1972;

Kodagali, Bhavsar, Kavani and Deshpande, 1973; and Singh, 1976). The diagnosis of the condition in buffaloes is normally arrived at, by clinical symptoms characterized by anestrus for a long time, although in few cases anovulatory estrus is not uncommon. Rectal palpation reveals ovary much larger than the normal size. The exhaustive type of work on COD as is done in the case of cows (Garm, 1949) has not been reported in buffaloes. The present investigation is an attempt to fill up this gap in buffaloes.

MATERIALS AND METHODS

The present work was undertaken on Murrah buffaloes presented at the Deonar abattoir, Bombay, for ante-

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mortem examination. In all, 540 animals were examined per rectum to detect the enlarged ovaries. The appearance of external genitalia and the uterine feel were noted and the blood of these animals was collected for estimation of circulating gonadotropins. The genital organs were examined immediately after slaughter. The ovaries were cut open and the diameters of the cysts were measured. The quality and quantity of the cystic fluid were noted. The tissues from different parts of the genital tract were preserved in 10% formalin for histo-pathological investigation. The tissues were processed and embedded in paraffin blocks. They were cut to 5-6 μ thick and stained by H.E. Method.

RESULTS AND DISCUSSION

Of the 540 buffaloes examined, 12 revealed enlarged ovaries on rectal palpation. On post-slaughter examination, when the ovaries were cut open and examined, 8 were found to be of the follicular type and 4 were of the luteal type of cysts. One of the right-sided follicular cysts was found to have a corpus luteum. (Table 1)

TABLE 1

Types of ovarian cysts with their locations.

Type of cyst	Right	Left	Bilateral	Total
Follicular cyst	4*	2	2	8
Luteal cyst	2	2	—	4
Total	6	4	2	12

*One of them consisted of corpus luteum.

The fluid content was thin and straw coloured in follicular cysts whereas it was slightly thick and yellowish in the luteal cysts. Quantity of the fluid varied from 9 to 20 ml depending

on the size of the cysts which measured from 2.5 to 4.8 cm in diameter. The wall of the follicular cyst was 1 to 3 mm thick whereas that of the luteal cyst was 2 to 6 mm thick. In all the cases, single cyst was observed.

The oviducts did not show any marked changes grossly. The uterine cornua, however, revealed a varying degree of firmness in the cases which had revealed follicular cysts and softness in those with the luteal cysts. The endometrial surface revealed softness in both the types. The cervix showed no distinct changes.

On microscopic examination of the genitalia, two distinct changes could be observed in the two types of cysts, as under.

Follicular cystic type (Fig. 1):



Fig. 1: Follicular cyst showing connective tissue capsule around the (degenerating granulosa cells.)

This was characterized by a thick layer of connective tissue around the degenerating granulosa cells. The follicular fluid was deeply eosinophilic. There was neither an oocyte nor the corona radiata. Mild oedema was found in the theca interna. Smaller sized

secondary follicles could be seen in some. They were one or two in number. In one case, normal corpus luteum could be seen along with the follicular cyst. The oviducts revealed severe hyperaemia and oedema with sometimes prominent granular masses at the apical ends of the cells and eosinophilic debris in the lumen. The uterus showed severe hyperemia with oedema in the stroma containing few cells (Fig. 2). The glands were atrophic.

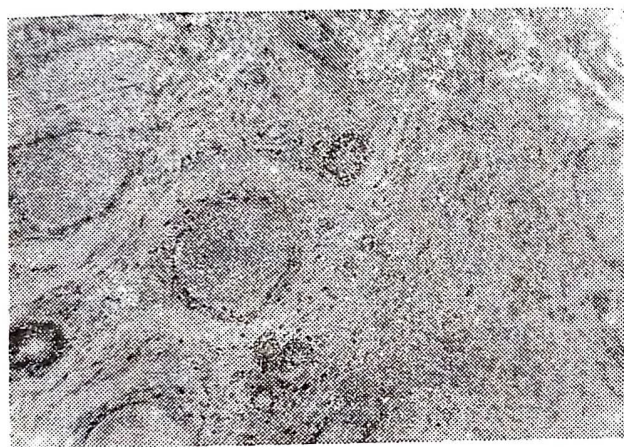


Fig. 2 : Uterus in follicular cystic condition showing extreme congestion of vessels and oedema.

Occasionally dilated glandular cysts could be observed. The cervix in general was hyperaemic and oedematous with active mucus secreting cells at the surface occasionally along with scanty mucus in the lumen.

Luteal cystic type (Fig. 3):

This was characterized by a thick band of connective tissue wall around a thin or thick layer of lutein cells. In the centre was found accumulation of light eosinophilic fluid. Few small atretic cysts could be seen in the ovarian stroma. The oviducts did not reveal any marked changes but the endometrium showed extensive oedema with



Fig. 3 : Luteal cyst showing fibrous capsule around a thick layer of lutein cells.

compressed uterine glands. Few of these glands occasionally were found cystic (Fig. 4). There were moderate num-

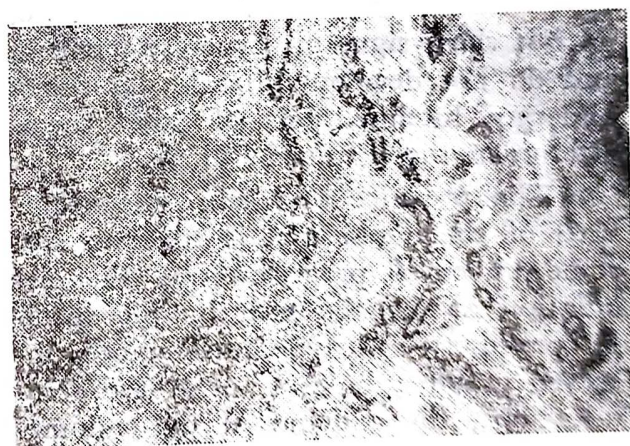


Fig. 4 Uterus in luteal cystic condition showing extension oedema and atrophic uterine glands.

ber of plasma or lymphocytic cells. The epithelial lining was thin and the cells were moderately atrophic. In one case, the endometrium and the cervix showed inflammatory changes.

The genital tract of the buffaloes with follicular ovarian cyst, showed increased vascularity and activity of the mucus secreting cells, indicative of

estrogenic influence. The serum estrogens could not be studied in the present investigations. But such a study appears to be very essential to confirm the above changes in the genital tract. However, the levels of gonadotropic hormones which have been estimated in the present work (Heranjal, Sheth, Desai and Rao, 1979) strongly suggest the condition being accompanied by the high levels of circulating estrogens, as the FSH levels were markedly increased in this condition.

The wall of the luteal cysts was thicker than the follicular cyst due to the layer of connective tissue and lutein cells. The formation of lutein cells in the luteal cyst in cows is considered to be due to luteinization of the theca without ovulation (McEntee, 1973). Cows which fail to ovulate, do not show signs of hyperestrogenism, and do not develop follicular cyst but undergo luteinization of the theca interna in the involved follicle.

The presence of lutein cells in the wall of the luteal cyst is suggestive of some traces of progesterone in the circulation as can be seen by the specific progestational type of changes observed in the tubular tract of the genitalia viz., the oedema in the endometrium and cervix as well as the softness of the myometrium recorded on rectal palpation and post-slaughter examination. However, the changes were not as marked as could be observed in the normal luteal phase of the estrous cycle. This is evidently due to the insufficient concentration of the steroid hormone secreted by few cells in the wall of the luteal cyst.

The single case of endometritis accompanied by cervicitis in the luteal cystic degeneration, observed in the

present study appears to be due to the known susceptibility of the genital tract under the influence of progesterone. It is well established that the genital tract under the influence of progesterone is more susceptible to infection when compared to the estrogen dominated one. In the absence of vascularity in progesterone dominated tract, this influence is bound to be deficient. The present study on COD in buffaloes based on rectal palpation and post-slaughter gross and microscopic examinations of the genital tract reveals that it is very essential to undertake the study of circulating steroid hormones also to know the exact etiology and the pathogenesis of this condition.

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