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AN OPERATED CASE OF BOVINE LUTEIN CYST ASSOCIATED WITH HYDROSALPINX

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INTRODUCTION

Of various diseases of the ovary in the cow, follicular cyst has been studied by many investigators, but little information has been obtained on lutein cyst. According to JOEST, only KRUPSKI and WILLIAMS had made independent investigations of lutein cyst in slaughterhouse materials. On the other hand, reports concerning disorders of the bovine fallopian tubes are comparatively numerous. WILLIAMS, LOMBARD, ROWSON and many others^{2, 7)} reported that pathological changes of the fallopian tubes were found in from several to more than 10 per cent of infertile cows. The present authors also, as reported previously,⁴⁾ have been studying disorders of the fallopian tubes by means of perturbation using a special apparatus. Recently they have encountered an interesting case of bovine infertility due to unilateral lutein cyst associated with hydrosalpinx. This report deals with the outlines of this case.

DESCRIPTION

1. Clinical history: The diseased cow was a purebred 10-year-old Holstein-Friesian. Delivery 2 times, the last parturition having taken place in May, 1953. Thereafter, she suffered from urovagina and endometritis. Moreover she has repeated 3 times persistent corpus luteum and cystic ovary unilaterally or bilaterally. Uterine irrigation, infusion of antibiotics, enucleation of persistent corpus luteum, hormonal therapy, etc. were prescribed as treatments. When her estrus and ovulation were cyclic and the condition of the uterus was healthy, several artificial inseminations were attempted, however, without success in conception.

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2. Clinical findings immediately before operation: No abnormalities in her general appearance. By rectal examination, the right ovary was as great as a pigeon's egg, with fluctuation and a large thick wall, and without causing nymphomania. The parenchyma existed only at the *extremitas tubalis*. The left ovary was small and atrophic. The right fallopian tube was found indurated in the form of a little finger for 5 cm from the *ostium abdominale tubae*. The opposite fallopian tube and the uterus showed nothing unusual. From these findings, she was suspected of having unilateral cystic ovary and occlusion of the fallopian tube. Operation was decided to remove the right ovary, in the hope of reactivating the left ovary.

3. Operation: The operation was undertaken in December, 1954. Tubo-ovariotomy was performed in the upper part of the right flank, vertical section of about 15 cm in length, in a standing position. The right ovary and the thickened portion of the fallopian tube were pulled out near to the section, and cut off after ligation of the surrounding blood vessels. The abdominal wound was sutured by the three series of sutures; the peritoneum, muscles and skin separately. On termination of the operation penicillin-G in oil (3,000,000 units) was administered intramuscularly.

4. Progress after operation: No untoward change was observed in the constitutional condition. From January to March, 1955, she suffered again from endometritis which was cured with several uterine irrigations. Thereafter, as she manifested estrus periodically, she copulated on May 7. After the copulation she showed anestrus. But the pregnant diagnosis by the rectal examination, on July 29, was found negative and urovagina and endometritis were noticed again.

5. Pathological examinations: Macroscopically the removed ovary was ovoid in shape, about $2.7 \times 2.6 \times 2.4$ cm in size, weighing 10 g. No change was noticed on its surface, but fluctuation was felt just as at the rectal examination before the operation. At section a cyst, about 1.7~2.2 cm in diameter, was found to occupy the most part of the ovary. The cyst cavity was filled with a transparent, yellowish and viscous fluid. In the interior part of the cyst wall, a brownish yellow luteal tissue, about 0.3 cm in width, was observed. The removed portion of the fallopian tube was very thick and hard. Its cross section was about 0.6~0.8 cm in diameter (3~4 times the normal size) and showed a network structure containing a transparent, hyaloid liquid. Its serosa surface was found partially adhered to the ovarian bursa and fibrins were noticed adherent to the whole surface of the serosa.

After being fixed with 10% formol solution, the removed ovary and fallopian tube were embedded in paraffin. Sections were made from these materials and stained with hematoxylin-eosin for microscopical examination. In the ovary, the

capillaries around the cyst wall were intensely dilated and filled with blood. At the internal layer of the cyst wall the connective tissue was observed rather thick. A layer of luteal tissue was found around the connective tissue. In the interstitial tissue of the luteal layer, slight capillary proliferation was observed. Cellular vacuolation was recognized at the peripheral part of the luteal tissue. On the other hand, the blood vessels around the fallopian tube showed intense hypermia and the cavity of the fallopian tube was remarkably dilated forming a network structure in some parts. In the epithelium of the cavity, the cells were observed flattened by the pressure of the fluid contained in the cavity.

From the above mentioned findings, the present case was diagnosed pathologically as lutein cyst associated with hydrosalpinx.

CONSIDERATIONS

1. JOEST classified lutein cyst into the following two types: one which develops from the corpus luteum arising after ovulation, and the other which develops from a follicle incapable of ovulation (a follicular cyst with the corpus luteum tissue according to JOEST). He stated also that the former did not disturb estrus and ovulation, while the latter restrained ovulation without causing nymphomania. Therefore, the present case is considered to be of the latter type on the basis of the clinical and pathological findings.

2. WILLIAMS reported that cystic degeneration of the corpus luteum was often associated with chronic salpingitis. AZIZUDDIN also described a case of lutein cyst associated with catarrh of the fallopian tube. In the present author's case, it was worthy of notice that hydrosalpinx coexisted.

3. WILLIAMS also reported that in the cases of hydrosalpinx, adhesion generally occurs between the ovary and the abdominal extremity portion of the fallopian tube or the mesosalpinx. ROWSON observed bilateral severe adhesion of the fallopian tubes in 13.3 per cent of 200 infertile cows. The adhesion noticed in the present case is coincident with that described in the above mentioned reports.

4. As for the technique of bovine ovariectomy, 2 methods, vaginal and abdominal (in the flank), have so far been described in the text books. In Japan, there exist only reports on the vaginal method by AKABORI and WAKIMOTO respectively, in the case of cystic ovary. In general, the flank method has not been practised. But in such a case as reported in this paper, the flank method would be more suitable than the vaginal one because the portion to be removed is comparatively large.

5. The prognosis of the present case will be decided shortly on practising perturbation and chromotubation through the fallopian tube in the left side.

SUMMARY

A purebred 10-year-old Holstein-Friesian cow which had been infertile approximately during 2 years was suspected after rectal examination of unilateral cystic ovary and occlusion of the fallopian tube. By investigating the pathological changes in the ovary and in the fallopian tube removed by ovariectomy, the present authors have considered the present case as being lutein cyst associated with hydrosalpinx. The animal recovered sufficiently to show cyclic estrus and ovulation, but she failed in conception after the first copulation.

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EXPLANATION OF PLATE

- Fig. 1. Macroscopic appearance of the cut surface of the removed ovary (Right), and of the removed portion of the fallopian tube (Left).
- Fig. 2. A part of the cyst wall of the removed ovary, showing layers of the connective tissue and of the luteal tissue. H.-E. stain. $\times 90$
- Fig. 3. Capillaries in the interstitial tissue of the luteal layer. H.-E. stain. $\times 90$
- Fig. 4. Cellular vacuolation at the peripheral part of the luteal tissue. H.-E. stain. $\times 270$
- Fig. 5. A part of the hydrosalpinx, showing a network structure. H.-E. stain. $\times 70$
- Fig. 6. Hyperemic capillaries around the fallopian tube. H.-E. stain. $\times 90$

