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Case Report

Mucometra Due to Follicular Cyst with Cystic Dilation of Endometrial Glands in A Holstein Friesian Crossbred Cow

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Abstract

A six-year-old Holstein Friesian crossbred cow was brought to the Large Animal Gynaecology ward, Madras Veterinary College Teaching Hospital for Artificial Insemination with the history of cloudy vaginal discharge. On rectal examination, the uterus was distended with fluid, On real-time ultrasonography, the ovaries were diagnosed with multiple large anechoic follicles in the right ovary and two large follicles in the left ovary. The uterine fluid was aspirated and found to be watery and cloudy. The cow was diagnosed with mucometra due to follicular cyst and treated with 20μg GnRH intramuscularly. Re-examination after 10 days showed the presence of corpus luteum (CL) on the left ovary and persistence of the cysts on the right ovary. GnRH treatment was repeated along with cloprostenol sodium (500μg I/M) for lysis of the corpus luteum. The condition persisted post treatment as the uterus was non responsive due to the severity and long-established condition. The treatment was unsuccessful mainly due to the thickening and unresponsiveness of the endometrium with longstanding persistence of follicular cyst and the prognosis was guarded.

Keywords: Endometrial Glands, Follicular Cyst, Hyperplasia, Mucometra

Introduction

Cystic ovaries are one of the most prevalent and economically destructive disorders in cattle, and are an important cause of subfertility and reduced reproductive performance (Smith, 2015). Cystic ovarian follicles are described as single or multiple follicles with a diameter of at least 20 mm present on one or both ovaries in the absence of active luteal tissue, which clearly interferes with normal ovarian cyclicity (Noakes *et al*., 2019). Although the main cause of follicular cysts is thought to be a dysfunction or imbalance in the hypothalamic – pituitary – gonadal axis, several predisposing factors also exist, including high milk yield, high ambient temperature (Smith, 2015), stress and negative energy balance (Enginler *et al*., 2012).

Ovarian cysts are divided into follicular and luteal cysts based on the degree of lutenization and progesterone levels in the blood or milk (Smith, 2015). Follicular cysts are thin walled and produce small amounts of progesterone, while luteal cysts have thicker wall and produce higher levels of progesterone. Diagnostic methods of ovarian cysts in cattle include rectal palpation, transrectal ultrasonography and the detection of progesterone concentrations in milk (Enginler *et al.*, 2012). The present report describes a case of Mucoometra with cystic dilation of endometrial glands due to follicular cyst in a Holstein Friesian crossbred cow.

Materials and Methods

A six year old Holstein Friesian crossbred cow was brought to the Large Animal Gynaecology ward, Madras Veterinary College Teaching Hospital for Artificial Insemination with the history of cloudy vaginal discharge for the past two days. The clinical parameters (temperature, pulse and heart rate) were within normal range. On rectal examination, the uterine horns were found to be distended with fluid, but no other signs indicative of pregnancy (foetal membrane slip, fremitus, foetal bump etc.) were observed.

Transrectal real-time ultrasonography of the uterus and ovaries was done with 7.5MHz linear transducer (Esaote, Italy). The uterine horns contained fluid of mixed echogenicity (Fig. 1). Three large anechoic follicles of diameter 17.7 mm, 9.5 mm and 11.9 mm in the right ovary (Fig. 2) and two large follicles in the left ovary of size 19.9 mm and 14.4 mm (Fig. 3) were observed.

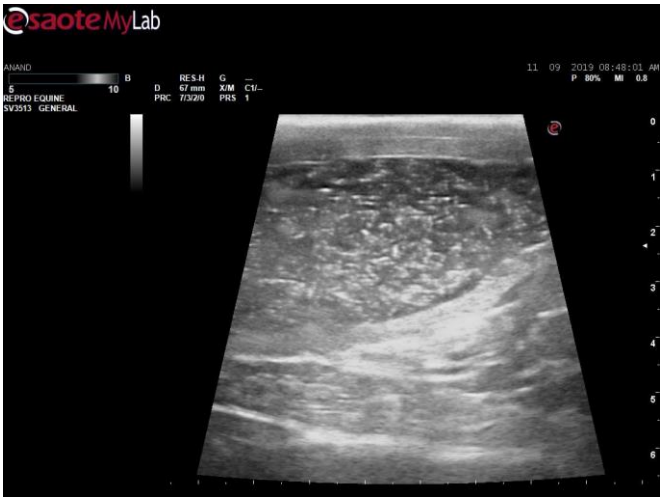

Figure 1: Ultrasound image of the uterus filled with fluid of mixed echogenicity

Figure 2: Ultrasound image of the right ovary showing 3 large follicles

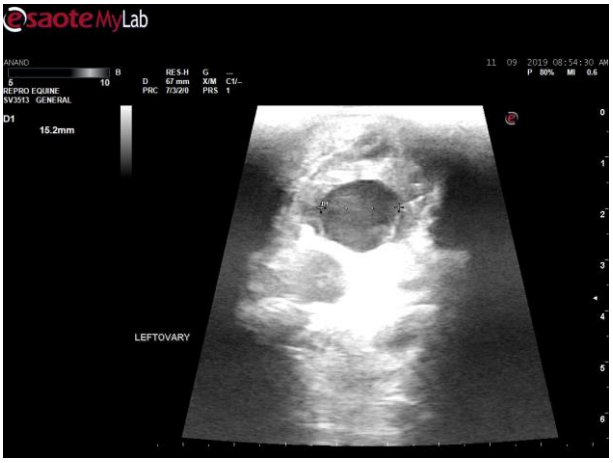

Figure 3: Ultrasound image of the left ovary showing 2 large follicles

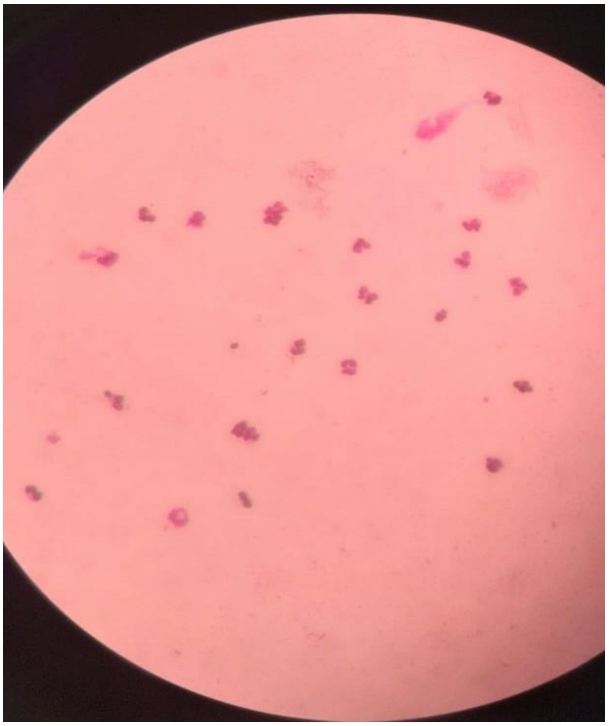

Figure 4: Cytological examination of the aspirated fluid showing numerous neutrophils and fibrin shreds

The uterine fluid was aspirated and found to be watery and cloudy, with numerous neutrophils and fibrin shred on cytological examination (Fig. 4). Results of an endometrial biopsy on histopathology revealed the multifocal glandular dilation with mild hyperplasia of the endometrium and oedema of the glandular lumen, with muco-proteinaceous fluid. Based on the above history and clinical findings, the case was diagnosed as mucometra due to the presence of long-standing follicular cysts.

Treatment and Discussion

The animal was given intramuscular injection of 20 µg GnRH (Gynarich®, 4µg/ml) on the first day and on transrectal ultrasonography after 10 days of treatment, a corpus luteum (CL) was observed on the left ovary, while the follicles in the right ovary remained unchanged. GnRH treatment was repeated, along with 500 µg cloprostenol sodium intramuscularly (Pregma®, 250µg/ml) to bring about lysis of the CL and to induce estrus. However, the CL persisted and the cysts on the right ovary were unchanged even after the treatment.

Increasing data and understanding of cystic follicles reveals that they are dynamic structures, which can go multiple directions. A cystic follicle can persist as a dominant structure (effectively preventing follicular growth), be replaced by another cystic follicle or regress, allowing the development of another follicular wave, and finally ovulation (Peter, 2004). Persistent follicular cysts cause hypertrophy of the endometrial glands, culminating in hydrometra/mucometra (Jeengar *et al*., 2014). However, in the present case, the consistency and mucoid content of the uterine fluid prompted a diagnosis of mucometra. The mucometra was accompanied by endometrial hyperplasia and dilation of the endometrial glands, which can be concluded to be caused by the persistent follicular cysts. A similar case was also reported by Dutt *et al.* (2019), in which mucometra was associated with follicular cysts.

Follicular cysts are most commonly treated with GnRH, which causes secretion of lutenizing hormone (LH) and lutenization of the cyst. This in turn makes the cyst sensitive to $PGF_{2\alpha}$, and regression of the cyst can then be brought about 8-9 days later with exogenous $PGF_{2\alpha}$ (Brito and Palmer, 2004). In the present case, an attempt was made to bring about ovulation of the follicle by intramuscular injection of GnRH. However, only the follicles on the left ovary responded, while those on the right ovary persisted. The CL formed on the left ovary was unresponsive to prostaglandin treatment, and the cysts on the right ovary did not undergo lutenization despite a second injection of GnRH.

Ablation of the cyst (either manually or ultrasound guided) can be considered for cysts which do not respond to

hormonal therapy. However, manual rupture of the cyst is frequently followed by adhesions, which adversely affect the future fertility of the cow (Peter, 1997). Ultrasound guided ablation is a safer method which avoids adhesion and bleeding in the ovary. The estrogens produced by the follicular cysts have a preventive effect on ovulation. Therefore, removal of the cyst will destroy the estrogen source, promoting new follicular development and ovulation (Amiridis, 2009). In the present case, this line of treatment was not attempted due to the thickening of the endometrium and oedema of the endometrial glands, which would be unable to respond to gonadotropin stimulation.

Conclusion

The present report describes a case of mucometra due to follicular cysts, its diagnosis and management. However, the treatment was unsuccessful due to the persistence of the cysts for a prolonged period of time and damage to the endometrial glands. The condition could not be resolved and the prognosis was guarded.

Conflict of Interests

The author expresses no conflict of interest with any other individual or organisation regarding the information discussed in the manuscript.

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