OVARIAN CYST IN MILKING SWAMP BUFFALO: A CASE STUDY

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ABSTRACT

A postpartum swamp buffalo with a high body condition score (4.5/5) that did not show any signs of heat after calving (days open= 122 days) was submitted for reproductive examination. The buffalo was milked every morning and suckled after that the whole day. On examination, an ovarian cyst of about 3 cm diameter was palpated rectally in the left ovary, which was confirmed by transrectal ultrasonography and by measuring the plasma progesterone level 7 days later. The case was treated with a common treatment regimen of gonadotropin releasing hormone followed by prostaglandin F2 alpha 7 days later. The buffalo returned to estrus and was mated with a bull 16 days after the onset of treatment. This case study suggests that a regular postpartum reproductive examination should be performed for a timely diagnosis of problems, and that treatment with a standard hormonal protocol can resolve cases of ovarian cyst in swamp buffaloes.

Keywords: *Bubalus bubalis*, buffalo, ovarian cyst, swamp buffalo, gonadotropin releasing hormone, prostaglandin F2 alpha

INTRODUCTION

Cystic ovarian follicle (COF) is a major reproductive problem, causing infertility and economic loss in buffaloes (Vanholder *et al*., 2006). The percent of slaughtered buffalo in India found to have COF was 9.5% (Saxena *et al*., 2006). The main categories of ovarian cysts are follicular cyst and luteal cyst (Vanholder *et al*., 2006). Follicular cysts are primarily observed in the early postpartum period (Vanholder *et al*., 2006). Follicular cysts resemble enlarged follicles, generally defined as varying in size greater than 2.5 cm in diameter, that persist for at least 10 days in the absence of a corpus luteum (Garverick, 1997). The most noticeable signs of follicular cysts are irregular estrus intervals, reduced milk production, persistent bulling behavior or nymphomania and anestrus (Vanholder *et al*., 2006). The cyst's surface during rectal palpation is smooth, slightly elevated, and fluctuating (Farin *et al*., 1990). Follicular cysts are usually thin-wall and secrete little progesterone (Brito *et al*., 2004; Noseir and Sosa, 2015). In the later stages of follicular cysts lutinization will occur and they will turn into luteal cyst (Brito *et al*., 2004). Luteal cysts have thicker walls (more than follicular cysts) produce more progesterone (level ≥1 ng/ml)

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and are associated with anestrus behavior (Brito *et al*., 2004). Rectal palpation reveals a flaccid uterus, firm, protruding on the surface of the ovary (Farin *et al*., 1993). The development of ovarian cysts in buffalo has been associated in the early postpartum period with hormonal, metabolic, nutritional and environmental imbalances (Garverick, 1997).

Intensive farming system methods have recently begun to be used in swamp buffalo farms in Thailand. The animals are fed prepared concentrates both for nourishment and to prepare the animals for buffalo contests or milking – rather than the free grazing system used in the past. Artificial insemination has also been used in the last 10 years. Many infertility issues have been detected, one of which is ovarian cysts which cause a long calving interval and reduce the lifetime productivity of the animal. There are no publications on ovarian cysts, however, in swamp buffalo. This case report could provide useful information and basic guidelines on how to approach the ovarian cyst problem in swamp buffalo.

CASE DESCRIPTION

The present study was carried out by a veterinarian team in a swamp buffalo farm in Prachinburi in the Eastern part of Thailand during a 4 month period from June 23rd, 2018 to August 19th, 2018. A postpartum routine checking of the case study's swamp buffalo was done. The buffalo was 5 years old, second parity with the last calving on 1 March 2018 (days open= 122 days) and the animal had shown no estrous signs since calving. This buffalo's milk output was less than other buffalo in the farm. The average milk yield from March 30, 2018 – to June 29, 2018 was 1.3 kg/day. The buffalo was fed 16% protein concentrate 6 kg/day once a day, roughage 2 times a day with fresh grass and rice straw, cleaned tab water was presented ad libitum. Both roughage and concentrate were stored in a clean and dry house. The buffalo and her calf were kept in an individual 25 m^2 pen with an insect protective net, rubber reclining pads and 15 minutes of sprinkle water every hour - throughout the day.

PHYSICAL AND REPRODUCTIVE EXAMINATIONS

Evaluation of vital signs: all were normal (temperature 101.8 ^{o}F, heart rate 52 bpm, pulse rate 60 bpm, respiration rate 72 bpm, CRT <2 seconds, pink mucous membrane). General physical examination showed a body condition score of 4.5/5, good hair coat, normal hydration status, feces score 2/5. External reproductive organs examination presented normal vulva conformation, pink-red vulva, clear mucous vaginal discharge, vaginoscopy score 0/3 (no pus) and shiny with normal moisture.

Internal reproductive organs were examined by rectal palpation which presented a closed cervix, 3 cm in diameter and 7 cm in length. Uterine tone was graded 1/3 (slightly flaccid) and exhibited a symmetry of uterine horns. A large size follicle of about 3 cm in diameter with smooth, fluctuating and elastic surface was found in the left ovary.

DIFFERENTIAL DIAGNOSIS

Ovarian cysts have some similar symptoms to, and are often misdiagnosed as: hydronephrosis, hydrosalphinx, paraovarian cyst,

ectopic pregnancy, ovarian torsion, tubo-ovarian abcesses, ovarian cancer and other conditions such as appendicitis or diverticulitis (Farin *et al*., 1993).

FURTHER DIAGNOSIS

The reproductive tract of the swamp buffalo was examined by transrectal ultrasonography. The ovaries were scanned with an ultrasound scanner equipped with a 6.5 to -7.5 MHz linear probe (SonoScape®, Italy). The cervix was 2.8 cm in diameter and absent uterine discharge (discharge score=0/3). The right uterine horn wall was 0.7 cm in thickness, the right ovary 3x2 cm in diameter with small spots of anechoic areas that appeared as small follicles. The left uterine horn wall was 0.9 cm in thickness, and the left ovary 3.4x4 cm in diameter with a thin-wall (1 mm), and a 3cm diameter anechoic and hypoechoic area. Blood analysis found macrocytic normochromic with neutrophilia, lymphopenia, monocytosis and stress leukogram. A plasma progesterone concentration of 0.2 ng/ml was measured using a standard assay kit (Chemiluminescent Microparticle Immunoassay, Abbotte Laboratory Limited, USA).

DIAGNOSIS

Tentatively, the case was diagnosed as an ovarian cyst (3 cm in diameter) in the left ovary, which was confirmed by transrectal ultrasonography and a plasma progesterone level of less than 1 ng/ml.

TREATMENT

The standard treatment protocol utilizes GnRH, followed 7 days later with prostaglandin F2 alpha ($PGF_{2\alpha}$). This protocol appears to induce ovulation in a high percentage of anovulation cases (Noseir and Sosa, 2015).

This protocol was selected for treating this case. As shown in Figure 1, on day -12 (June 23, 2018) the initial diagnosis was done (palpation and ultrasound). On day – 5, (June 30, 2018) blood collection for a complete blood count (CBC) and blood chemistry analysis was performed. On day -2 (July 3, 2018), blood collection to check the progesterone level was done. On day 0 (July 5, 2018), the buffalo was injected with 5 ml GnRH (0.02 mg buserelin acetate, Receptal®, Intervet International GmbH, Germany). Seven days later (July 12, 2018) blood collection to check the progesterone level and an ultrasound for corpus luteum detection were done, followed by an injection of 5 ml $PGF_{2\alpha}$ (25 mg dinoprost tromethamine, Lutalyse®, Pfizer Inc, USA). Finally on day 23 (July 18, 2018) the buffalo was successfully mated (Figure 1).

PROGNOSIS

After treatment with this protocol, the ovarian cyst in the swamp buffalo was resolved in 10 days (Figure 2). A normal, fertile estrus can be expected in 15–30 days. Likewise, successful treatment will increase the rate of pregnancy.

DISCUSSION

Ovarian cysts are one of the most important ovarian disorders in buffalo. This buffalo showed

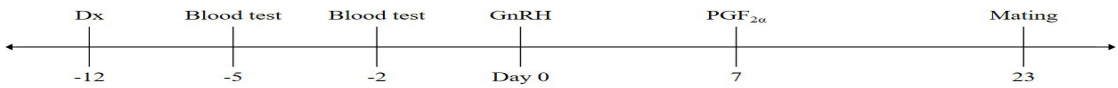

Figure 1. Follicular cyst treatment protocol.

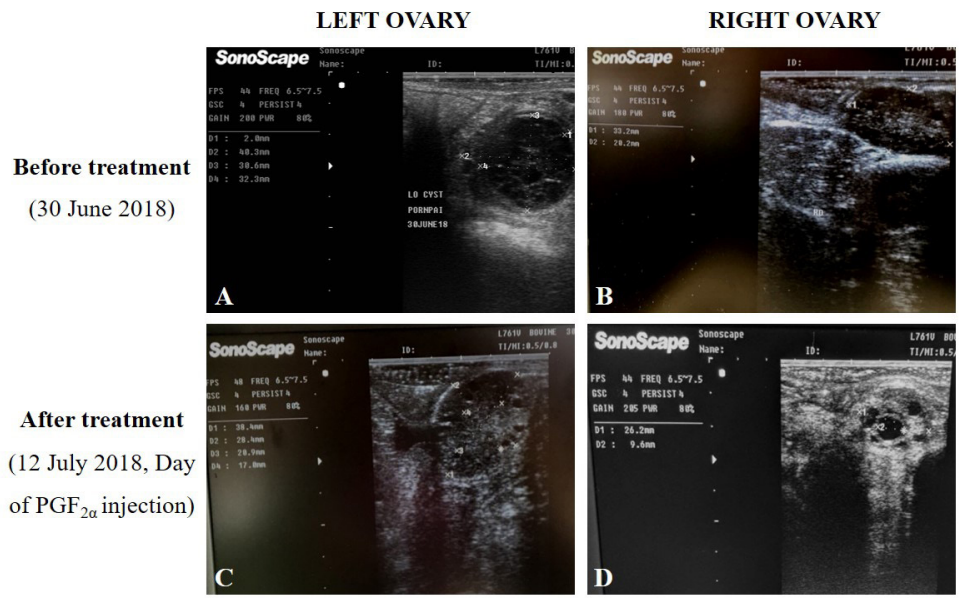

Figure 2. The ovarian structures before and after treatment were monitored by ultrasonography;

(A) The diameter of the left ovary is 4x2 cm the diameter of the ovarian cyst is 3.2x3 cm with a thin- wall (1 mm).

(B) The diameter of the right ovary 3.3x2 cm with small and medium follicles.

(C) The diameter of the left ovary is 3.8x2.8 cm, the diameter of a corpus luteum is 2x1.7 cm.

(D) The diameter of the right ovary is 2.2x1.4 cm with small, medium follicle.

a slightly fat (4.5/5) body condition score which could suggest that nutritional imbalances and metabolic disorder factors induced the ovarian cyst issue, which is consistent with the blood test results that showed a stress leukogram (Garverick, 1997). Our study presented a case of an ovarian cyst in a swamp buffalo as confirmed by transrectal ultrasonography and plasma progesterone level detection as its differential diagnostic methods (Medan et al., 2004). This ovarian cyst could have been a follicular cyst based on the evidence. The cow presented a milk production rate which was lower than normal in swamp buffalo (2.0±0.9 kg/cow/day) (Chaikhun et al., 2012). Transrectal ultrasound of these structures was compatible with a large follicle with a thin wall and a fluid and content-filled cavity. These findings were in agreement with Brito et al. (2004) as was the concentration of plasma progesterone 0.2-0.4 ng/ml (Lin *et al*., 1993). The ovarian cyst may have been in the process of transforming from a follicular cyst to a luteal cyst which may be why the cow presented anestrus. The results of the present study demonstrate that an ovarian cyst can be treated effectively using a single injection of GnRH followed by $PGF_{2\alpha}$ (Garverick, 1997). The efficacy of this treatment of follicular cysts was confirmed by the luteinization of the follicular cyst and an increase in the concentration of progesterone (Medan *et al*., 2004). In this case study on day 7 after treatment examination showed the corpus luteum in the left ovary similar to a previous report (Nanda *et al.,* 1988). The hormonal protocol in this case has been used successfully for the treatment of follicular cysts in buffalo with a success rate of 60 to 70%, similar to the rate reported in cows treated with GnRH (Ribadu, 1991; Garverick, 1997). A report has suggested that a successful mating program may reduce recurrences by establishing pregnancy as soon as possible (Brito *et al*., 2004). Therefore, regular estrous detection and mating either by bull or artificial insemination were suggested to the farmer and the buffalo was mated by bull 16 days after treatment. Postpartum reproductive function should be monitored at least 45 days after calving for an ovarian resumption evaluation (Peter *et al*., 2009). This could help detect any reproductive issues and assist in the creation of an efficient mating plan in buffalo farms.

In conclusion, the predisposing factors in the present study were nutritional imbalances and metabolic disorders. The follicular cyst in this case was confirmed by transrectal ultrasonography and the concentration of plasma progesterone. The standard treatment with GnRH and $PGF_{2\alpha}$ injections was found to be effective in treating the follicular cyst in this swamp buffalo. However, stress management and proper dietary management should be monitored in this case to prevent reoccurrence.

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