

## ULTRASONOGRAPHIC DIAGNOSIS OF REPRODUCTIVE DISORDERS IN MURRAH BUFFALOES

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### ABSTRACT

The present investigation was carried out in the year 2016 to 2017 at government livestock farm sector-1 and buffalo farm of LUVAS on Murrah buffaloes and a total of 70 post-partum animals were examined using real time B mode ultrasonography. A total of 13 animals were diagnosed with reproductive ailments including granulosa cell tumour, follicular cyst, mucometra, parovarian cyst, pyometra, hydrometra, cystitis and early embryonic mortality.

**Keywords:** *Bubalus bubalis*, buffaloes, early embryonic mortality, follicular cyst, granulosa cell tumour, hydrometra, mucometra, parovarian cyst, pyometra, ultrasonography

### INTRODUCTION

The advent of real time B-mode ultrasonography (USG) in bovine reproduction especially follicular dynamics and pregnancy diagnosis has grown rapidly in the last decade. It is a non-invasive technique; therefore, repeated

examinations of an animal's reproductive system can be performed without impairing its future breeding potential. Various reproductive disorders affect reproductive performance of buffaloes; generally leading to drop in milk production, fertility, and economy of farmers. Ovarian aberrations lead to failure of conception and increase in calving to conception interval. In modern era, ultrasonography has been widely acknowledged tool for bovine reproductive health management and research owing to its non-invasiveness and reliability. Several pathologies of ovary and uterus, not accurately assessed by trans-rectal palpation, can easily be diagnosed with USG.

### MATERIALS AND METHODS

The study was conducted on a total of 70 Murrah buffaloes at government livestock farm sector-2 and buffalo farm of LUVAS Hisar. The animals were screened in routine for diagnosis of various reproductive problems at these organized farms. For this study SonoScape ultrasound machine equipped with trans-rectal probe having 7.5 MHz frequency was utilized. After proper

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restraining of the animal without use of any tranquilizing agents, the rectum was emptied by back-racking and ovaries were palpated. Ultrasound jelly was applied over the surface of probe before its insertion into the rectum. The transducer was slid along the dorsal surface of the genital tract for orientation, and then it was directed laterally to scan the ovaries. During scanning, individual ovary and the probe were held in the same hand. Ovaries were scanned by turn, assessing the structures in each ovary by moving the probe from medial to the lateral aspect. Also, the echogenicity of the contents of uterus was observed and images were frozen.

## RESULTS AND DISCUSSIONS

### Granulosa cell tumor

Granulosa cell tumor was multilobular and fluid filled with a diameter of 4.1 inches (Figure 1). These are benign tumors (Noakes *et al.*, 2019) and occur singly or in combination of solid and cystic (Zinnebauer, 1961). Surgical removal of the affected ovary is the choice of treatment.

### Follicular cyst

Buffaloes were affected with bilateral follicular cyst (one on each ovary) and having diameter more than 17 mm and follicular wall thickness less than 3 mm (Figure 2) in accordance with the criteria suggested by Noakes *et al.* (2019). The most widely accepted etiology for the origin of follicular cyst is aberrations in preovulatory surge of luteinizing hormone. Ovarian cysts are uncommon in buffalo and most clinical studies record an incidence ranging from 0.5% to 1.48% whereas a few abattoir studies recorded a relatively higher incidence (Purohit, 2014). Treatment

includes administration of LH like hormone or GnRH agonists or progesterone.

### Pyometra

Pyometra was characterized by accumulation of pus in four buffaloes. History revealed intermittent discharge of purulent material from the vagina and anestrus. Ultrasonographically, the echotexture of uterine contents was 'speckled' (Figure 3) and persistence of corpora lutea on either of the ovaries. Postpartum pyometra is not a consistent event and is believed to be caused by the growth of bacteria in the uterus after the formation of the first corpora lutea (Noakes *et al.*, 2019). The drug of choice is prostaglandin F<sub>2α</sub> followed by a course of systemic broad-spectrum antibiotics for 5 to 6 days.

### Hydrometra

Hydrometra in bovines is characterised by accumulation of transparent watery fluid in the uterus leading to atrophy of the uterine wall. The uterus was filled with hypochoic fluid without placentomes or fetal membranes or fetus (Figure 4). But the animal was having history of mating 4 months ago. Usually, the hydrometra is associated with follicular cyst but in the present case ovaries were normal with persistent corpora lutea. An incidence of 1.78% has been reported by Mittal *et al.* (2009). The animals are generally culled as they are non-responsive to hormonal therapies.

### Mucometra

Mucometra refers to accumulation of mucin like substance in the uterine lumen. Ultrasonographically, the fluid was hyperechoic in nature (Figure 5) with persistent corpus luteum on the right ovary without placentomes or fetal membranes or fetus. The animal had history of

Table 1. Transrectal real time B-mode ultrasonography of the animals following reproductive ailments was diagnosed.

Sr. No.	Gynaecological problem	Number of animals affected	%
1	Granulosa cell tumour	1	1.43
2	Follicular cyst	2	2.85
3	Mucometra	1	1.43
4	Parovarian cyst	1	1.43
5	Pyometra	4	5.71
7	Hydrometra	2	2.85
8	Cystitis /vaginal prolapse	1	1.43
9	Late embryonic mortality	1	1.43

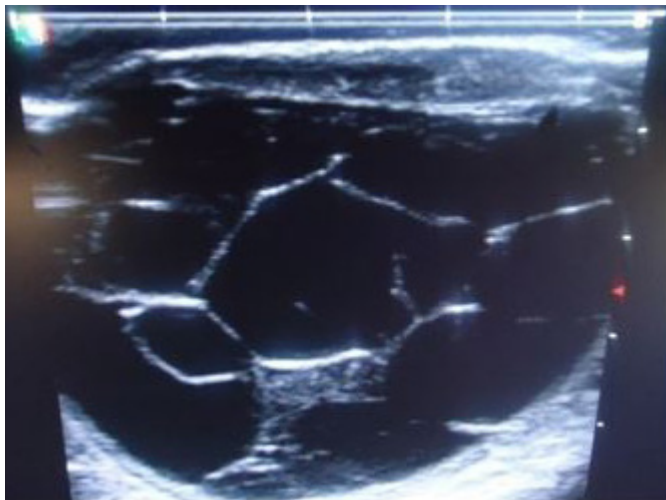


Figure 1. Ultrasonograph of Granulosa cell tumor in a buffalo.

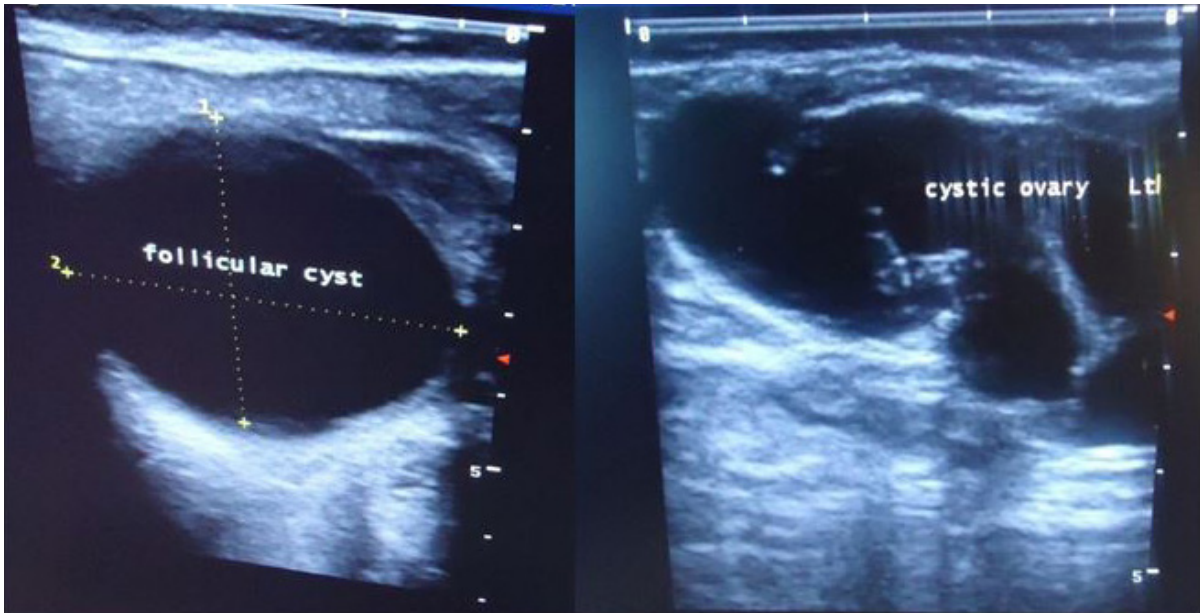


Figure 2. Ultrasonographic image of follicular cyst.

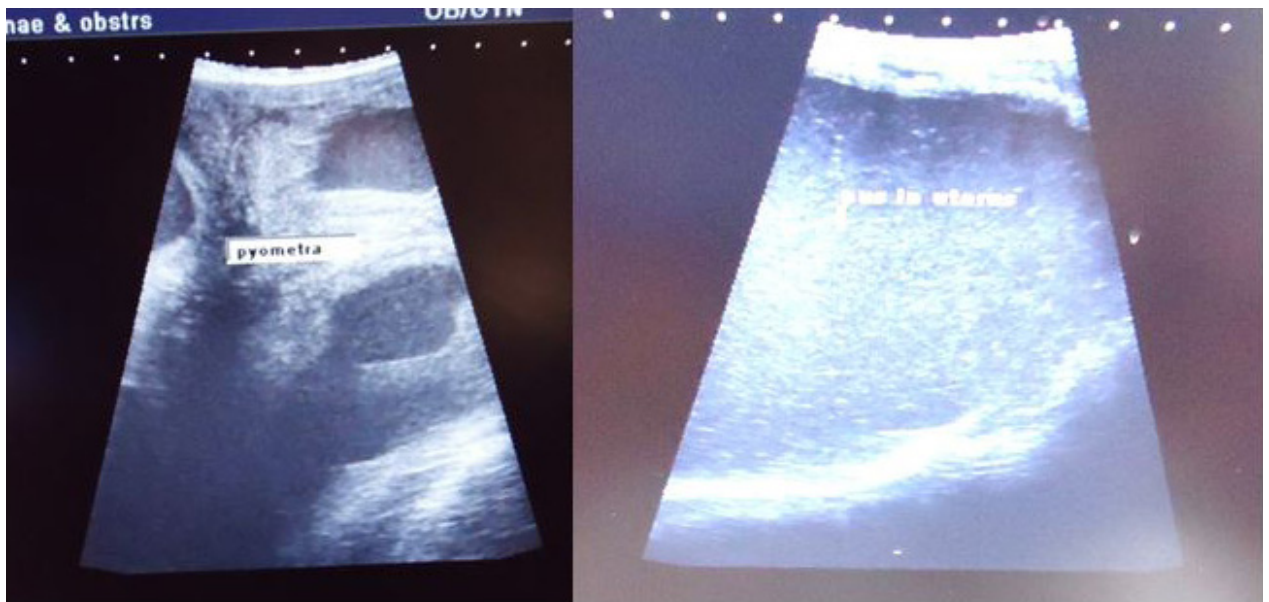


Figure 3. Ultrasound images of Pyometra in Murrah buffaloes.



Figure 4. Ultrasonograph of Hydrometra in buffalo.



Figure 5. Ultrasonograph of Mucometra.



Figure 6. Embryonic mortality (absence of heartbeat).



Figure 7. Ultrasonographic diagnosis of Cystitis.



Figure 8. Ultrasonograph of Parovarian cyst in buffalo.

artificial insemination three months ago. Various workers (Roberts and Fox 1968; Al-Dahashand David, 1972; Vahida and Jayakumar 2000; Dutt *et al.*, 2019) had reported mucometra or hydrometra linked with multiple reproductive ailments in bovines and generally culling of the affected animals is recommended.

### Embryonic mortality (EM)

Trans-rectal real time-B mode USG at 45 days of pregnancy revealed embryonic mortality as evidenced by presence of fetal membranes and hyperechoic fluid in the uterus and absence of embryonic heartbeat. Upon Color Doppler ultrasonography, the blood supply was found to be lacking in the uterine lumen. In comparison to cows, a higher occurrence of late EM is seen in buffalo (Campanile *et al.*, 2005). The most extensively studied approach to reduce EM in

buffalo that show seasonality in ovarian function has been treated with progesterone implants, hCG, and GnRH analogues. These therapies elevate concentrations of progesterone in blood circulation (Campanile *et al.*, 2016) and progesterone is responsible for pregnancy maintenance.

### Cystitis

The animal diagnosed with cystitis had thickened wall of urinary bladder (Figure 7). The animal had history of frequent attempts to urinate, restlessness, tail switching, polyuria, vaginal prolapse and intermittent straining. Inflammation of bladder occurs mainly due to ascending or descending infection. Antibiotic sensitivity testing (AST) of urine sample was carried out and enrofloxacin was found to be sensitive. Long acting enrofloxacin was advised for 5 days. In cystitis, the urine becomes opaque turbid due to presence of

desquamated epithelial cells of the urinary bladder in urine (Sudhakara *et al.*, 2017). Ultrasonography is a useful diagnostic and prognostic tool for various urinary tract affections in bovines (Khan *et al.*, 2013).

### Parovarian cyst

The Parovarian cyst observed was around the right ovary (Figure 8) and had no interference with cyclicity of the animal. Parovarian cysts are vestige of the mesonephric ducts that are sporadically found around the ovary and oviducts, attached to the broad ligaments of bovines (Azawi *et al.*, 2010). Tiny Parovarian cysts of a few millimetre diameters are random findings in abattoir buffalo genitalia (Mittal *et al.*, 2010). These are of little significance as far as infertility is concerned.

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