



## CASE REPORT

### Diagnosis of Pseudopregnancy in a Beetal Goat Using Real-Time B-Mode Ultrasonography

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#### ARTICLE HISTORY (15-080)

Received: February 15, 2015

Revised: May 19, 2015

Accepted: May 27, 2015

#### Key words:

Beetal goat

Hydrometra

Ovary

Pseudopregnancy

Ultrasonography

Uterus

#### ABSTRACT

A four-year old Beetal goat was presented for early pregnancy diagnosis 30-days post-breeding. The goat was healthy and showed distended abdomen. Two ultrasound examinations of the reproductive tract were performed on 30<sup>th</sup> and 60<sup>th</sup>-day post-breeding, using 3.5 MHz convex and/or 7.5 MHz linear array transducers to diagnose pregnancy. On 30<sup>th</sup> and 60<sup>th</sup> day post-breeding, uterus appeared thin-walled, compartmentalized and filled with clear, anechoic fluid; without the presence of any fetus or placentome. On 60<sup>th</sup> day post-breeding, transrectal scanning (7.5 MHz) revealed two large (5-6 mm) and a small follicle (2-3 mm) along with a corpus luteum (8 mm) on the right ovary. Based on the characteristic ultrasound images of the uterus and ovary, pseudopregnancy was diagnosed in the Beetal goat.

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**To Cite This Article:** Khan MIR, AA Channa and A Sattar, 2015. Diagnosis of pseudopregnancy in a Beetal goat using real-time B-mode ultrasonography. *Pak Vet J*, 35(4): 537-539.

#### INTRODUCTION

Pseudopregnancy (hydrometra or cloudburst) is a condition in which aseptic fluid accumulates in the uterus, and corpus luteum persists on ovary without the presence of any fetus (Pieterse and Taverne, 1986). This condition has often been reported in the bitch (Harvey *et al.*, 1999) and the queen (Zschockelt *et al.*, 2014) but also prevails in sheep (Yotov *et al.*, 2009) and goats (Hesselink, 1993b). Older goats are more susceptible to pseudopregnancy than younger goats (Hesselink, 1993b).

Real-time ultrasonography is an efficient method to diagnose pseudopregnancy (Hesselink, 1993; Moraes, 2014). However, early pregnancy in does around 20-30-day post-breeding is difficult to differentiate from pseudopregnancy via ultrasonography (Taverne, 2010). Therefore, correct approach and analysis of ultrasound scans of the uterus and ovary are necessary for the diagnosis of pseudopregnancy. This report describes the diagnosis of pseudopregnancy in a Beetal goat based on ultrasound examinations of ovary and uterus performed on 30<sup>th</sup> and 60<sup>th</sup> day post-breeding.

**Case history:** A four-year-old, healthy Beetal goat was presented at the clinic of the Department of Theriogenology, University of Veterinary and Animal sciences, Lahore for the diagnosis of early pregnancy. According to the owner, the goat was bred around 30 days ago and she did not show heat signs afterwards. She was not bred afterwards, kept indoors without a breeding buck

and offered seasonal green fodder, water and concentrate. She showed a distended abdomen and a transient udder enlargement few days ago.

**Clinical examination:** In general, the goat had a good body condition with normal body temperature (103.3° F). Conformation of mammary glands and external genitalia was normal. There was no visible discharge from vulva; however, goat had a distended abdomen. Initial ultrasound examination was performed transcutaneously by placing the 3.5MHz convex transducer (Falco Vet 100; PieMedical, Holland) on the right inguinal area above and cranial to the udder. First, urinary bladder was located as anechoic fluid-filled sac. Then, uterus was scanned which contained anechoic fluid and appeared to be divided into compartments by thin layers of hyperechoic uterine wall (Fig. 1). However, there were no discernible embryos or placentomes at this time. Therefore, early pregnancy was not confirmed and a second ultrasound examination was recommended after about 20 days. .

Second ultrasound examination of the goat was performed at 60<sup>th</sup> day post-breeding using convex (3.5 MHz) and linear (7.5 MHz (Aloka SSD 900; Tokyo, Japan) transducers. Transcutaneous scan of the uterus via convex transducer revealed a similar picture as was observed 30-days ago (Fig. 1). Then a linear array transducer was passed transrectally for about 5-6 inches and rotated to either right or left side to access respective ovaries. Uterine lumen was found divided into adjacent compartments by the hyperechoic thin uterine wall and no

fetuses or placentomes were detected (Fig. 2A). Left ovary had no follicles and corpus luteum; however, right ovary had two large follicles of 5-6 mm and a growing follicle of 2-3 mm diameter with a corpus luteum of 8 mm diameter (Fig. 2B). Based on the two ultrasound examinations, a condition of pseudopregnancy was diagnosed in the goat. A treatment comprising of prostaglandins F2 alpha (PGF<sub>2α</sub>) was prescribed to resolve pseudopregnancy, but the owner did not agree to treat the goat.

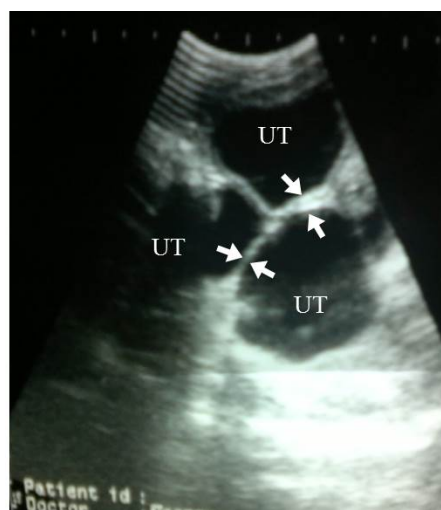
## DISCUSSION

This report documents the diagnosis of pseudopregnancy in a Beetal goat using real-time B-mode ultrasonography. Pseudopregnancy is a pathological condition of mated and non-mated goats in breeding and non-breeding season (Moraes, 2014). This condition is caused by disorder in luteolytic or luteotropic mechanisms and characterized by a persistent corpus luteum, accumulation of fluid in the uterus and high plasma progesterone concentrations  $\geq 2$  ng/ml (Taverne *et al.*, 1995). Pseudopregnancy can prevail until 120-150 days before it could resolve spontaneously (Taverne, 2010).

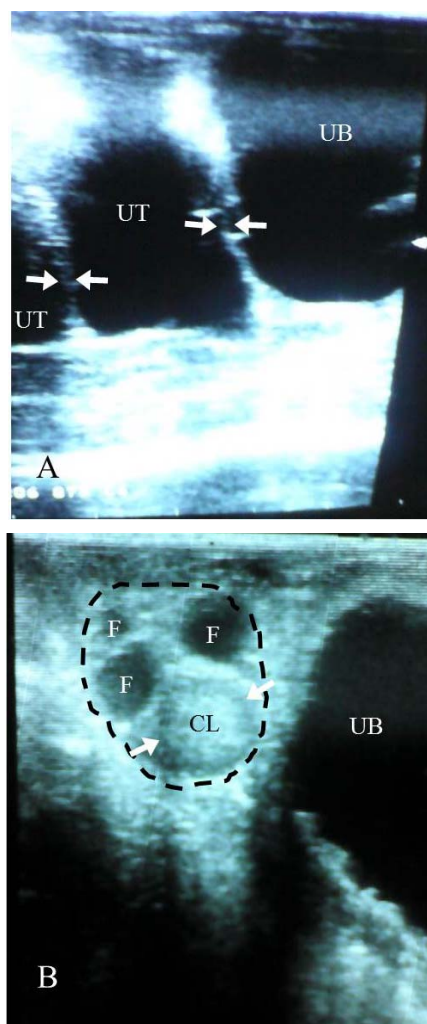
In this case study, two ultrasound examinations were performed on 30<sup>th</sup> and 60<sup>th</sup> day post-breeding. Both times, a non-echogenic, fluid-filled uterine lumen appeared divided into compartments by hyperechoic tissues, as described previously (Kähn, 2004), and represent the cross-sections through apposing uterine wall of the curved and dilated uterine horn (Hesselink and Taverne, 1994). In this report, non-echogenic fluid in uterus was considered aseptic due to the absence of echogenic cellular debris/snowflakes and thick uterine wall, which are typical in pyometra or putrefaction (Kähn, 2004). In addition, the presence of two large follicles (5-6 mm) on the right ovary was suggestive of their anovulatory nature; due to high plasma progesterone concentrations from prevailing corpus luteum (Adams *et al.*, 1992). In the current case, persistent nature of the corpus luteum was ascertained based on the absence of heat symptoms in goat between the two examinations. All of these findings led to the diagnosis of pseudopregnancy in Beetal goat.

It is difficult to differentiate pseudopregnancy from early pregnancy of about 30 days through ultrasonography (Hesselink and Taverne, 1994). This is because of barely discernible embryos at early stage of pregnancy. In addition, the presence of a large amount of uterine fluid in pseudopregnancy can be mistaken as allantoic fluid (Taverne, 2010). Therefore, two ultrasound examinations (transcutaneous or transrectal) of the reproductive tract, 20-40 days apart, are recommended in goats (Pieterse and Taverne, 1986).

Incidence of pseudopregnancy is unknown in Beetal goats. Earlier studies suggest an incidence of pseudopregnancy varying between 3 to 21% in different dairy breeds of goats (Hesselink, 1993; Souza *et al.*, 2013; Murugavel and Antoine, 2014). At Theriogenology clinic of University of Veterinary and Animal Sciences Lahore, out of 628 cases presented for the diagnosis of early pregnancy between September-November 2014; only two cases of pseudopregnancy were reported in Beetal goats with help of ultrasonography (Personal communication).



**Fig. 1:** Transcutaneous ultrasound image of a Beetal goat suspected for pseudopregnancy at 30<sup>th</sup> day post-breeding. Hyperechoic uterine wall (arrows) divide anechoic uterus (UT) into compartments.



**Fig. 2:** Transrectal ultrasound images of a Beetal goat on 60<sup>th</sup> day post-breeding. A) Hyperechoic uterine wall (arrows) divide anechoic uterus (UT) into compartments; B) Cranial to urinary bladder (UB), right ovary (dotted line) presents a persistent corpus luteum (CL) of 8 mm diameter (arrows), anovulatory follicles (F; n=2; 5-6 mm) and a small follicle (F; 2-3 mm).

Treatment of the pseudopregnancy involves luteal regression by administering a single or double dose of luteolytic drug (prostaglandins or its synthetic analogs) (Souza *et al.*, 2013; Murugavel and Antoine, 2014). Consequently, relaxation of cervix and uterine contractions occur to discharge the fluid within 1-2 days following the treatment (Taverne, 2010). Often pseudopregnancy resolves spontaneously by sudden discharge of uterine fluid due to aging corpus luteum without any treatment and this is referred to as “cloud burst” (Taverne *et al.*, 1995).

Pseudopregnancy is overlooked in goats at farms and clinics due to the absence of ultrasound and lack of skills to interpret the images. Consequently, the condition can prevail for long duration and affect the fertility of the goats. Therefore, it is recommended that ultrasonography between 30-60<sup>th</sup> days post-breeding is useful for early and accurate diagnosis of pseudopregnancy in Beetal goats.

**Author’s contribution:** MIRK performed ultrasonography, diagnosed the condition and wrote the manuscript. AAC and AS reviewed and edited the manuscript.

**Acknowledgement:** Authors are thankful to Dr. Nasim Ahmad, Professor, Department of Theriogenology, University of Veterinary and Animal Sciences, Lahore for providing access to ultrasound machine (ALOKA SSD 900, Japan) and transrectal transducer (7.5 MHz).

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