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Clinical use of fetal gastrointestinal motility to predict parturition in the bitch

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INTRODUCTION: An accurate estimation of parturition time in the bitch is a very useful information to help clinicians manage normal and problematic parturitions as well as to plan an induced labor or a cesarean delivery. Intestinal peristalsis is an important finding that provides evidence of completion of canine fetal organogenesis (1). The first visualization of intestinal peristalsis occurs at approximately 48 to 54 days of gestations, although peristalsis is not constant and may differ between bowel segments (2). However, recent studies suggest that ultrasonographic assessment of intestinal peristalsis should not be used as a sole parameter when scheduling C-section (2).

OBJECTIVE: To investigate fetal gastrointestinal motility using B-Mode and color Doppler in the last week of pregnancy as a criteria to predict the day of parturition in bitches.

MATERIALS AND METHODS: 5 pregnant bitches (a 4-yr old Flat Coated Retriever, a 3-yr old Basset Hound, a 2-yr old Jack Russell, a 2-yr old Collie, a 5-yr old Australian Shepherd) were followed every other day from day 55 post ovulation (PO) in order to evaluate: (a) fetal intestinal peristalsis and fetal heartbeats by B-mode and doppler ultrasound (US); (b) vaginal and rectal temperature (3). At day 55, a complete blood count, biochemistry blood analysis and serum progesterone concentration were also evaluated. Gestational age was confirmed and corrected by counting backward from delivery (D63). All ultrasounds exams were performed with a 4-9 MHz transducer connected to a commercial ultrasound unit (Zonare, Zonare Medical Systems Inc, Mountain View, California, USA). In two fetuses on each pregnant bitch, gastrointestinal motility was recorded during 3 seconds. Fetal gastrointestinal movements occurring on each fetus on each given day were counted per unit of time, and values compared across time.

RESULTS: Overall, an increase in fetal gastrointestinal motility was observed as the day of parturition was approaching. Ultrasound examination on days 60 to 61 (final US) allowed an easy and immediate observation of intestinal peristalsis in all the fetuses examined. A decrease in fetal heartbeats was observed from D58-59 to D60-61. A decrease in vaginal (0.8±0.1°C) and rectal temperature (0.7±0.2°C) between day 55 and 63 was also detected.

CONCLUSIONS: An increased fetal gastrointestinal motility was observed on ultrasound, with a maximum activity on day 60-61 PO in all the fetuses evaluated, in parallel with the decrease in the fetal heartbeats and a decrease in the dam’s vaginal and rectal temperature. More data and a statistical analysis are necessary in order to better understand the dynamics of fetal peristalsis visualized on ultrasound and to correlate it to the day of parturition.