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Normal Parturition In Dogs- A Review

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Introduction

Understanding the neuroendocrine cascade of parturition assists the clinician in managing the dam and understanding the etiology of dystocia. The accepted neuroendocrine model of canine parturition is initiated by the fetus. The fetal hypothalamic-pituitary-adrenal axis is activated by fetal stress and leads to the secretion of fetal glucocorticoids. This increased glucocorticoid concentration stimulates maternal estrogen production, contributes to the synthesis and release of prostaglandins, and increases oxytocin receptors on the myometrium. Prostaglandins are luteolytic, contribute to the decline in circulating progesterone, remove the inhibition of myometrial contractility, and mediate the effects of oxytocin on the uterus. Maternal oxytocin is initially released from the hypothalamus in response to afferent stimulation of pressure receptors within the cervix and vagina. Relaxin hormone, produced by the ovary and placenta, assists fetal passage by allowing the interpubic ligament to elongate and the pubic bones to separate. The prolactin (lactation hormone) level, which increases gradually during gestation starting 21 to 28 days after ovulation, rises suddenly with the decline in the progesterone level.

Labor in dogs is described as occurring in three stages. The first stage is cervical dilation, the second is expulsion of the fetuses, and the third is expulsion of the placentas. First-stage labor occurs as a distinct period and concludes with the onset of the hard contractions signaling second-stage labor. Second- and third-stage labor alternate as the bitch passes one or two pups and then one or two placentas alternately until done.

Stage 1: The onset of stage 1 labor may be difficult to define precisely. Restless behavior, anorexia, and nesting may all be seen several days before parturition as well as during stage 1 of labor. Mammary gland turgidity, milk secretion, and relaxation of pelvic and abdominal musculature are described. A decline in rectal temperature below 99.7°F (37.6°C) has been cited as the most consistent change indicating that parturition will take place within the next 12 to 24 hours. This drop coincides with the decrease in the plasma progesterone level below 2 ng/ml. The bitch's cervix is dilating, but

she is not having strong, coordinated abdominal contractions. She may be restless and panting. She usually refuses to eat and may vomit. This stage may last for up to 12 hours in normal bitches. Intervention is recommended if the bitch does not enter stage 2 labor, with obvious contractions, within 12 hours. Prolonged stage 1 labor (i.e., >18 hours) has been associated with increased incidence of stillbirths and neonatal death.

During stage 1 labor, the hormones relaxin and oxytocin contribute to relaxation and dilation of the cervix. Because of the extreme length of the canine vagina, the cervix is not palpable. If a circumferential constriction is felt when a gloved finger is passed into the vagina, it probably is a ring of vaginal tissue, not the cervix.

Stage 2: In this, the labor is considered to have started when the bitch starts having obvious, coordinated contractions. Movement of a pup, especially a pup's hard, round head, into the cervix stimulates release of oxytocin and uterine contractions. If pups are not presenting a firm surface against the internal os of the cervix, this reflex release of oxytocin may not occur and labor may not progress. Rising prolactin concentrations contribute to mothering behavior by the bitch and promote lactation. Stage 2 labor should be complete within 12 to 24 hours, with a fetus produced every 0.5 to 4 hours. Bitches may pass a fair volume of clear fluid from the vulva before a puppy is passed. Green vulvar discharge also may be seen. The green coloration arises from the edge of the placenta and indicates that placental separation has occurred. Pups may be born within a clear sac, or the sac may rupture as the pup moves through the birth canal or be ruptured by the bitch as the puppy passes through the vulva. The bitch should vigorously lick the newborn pup to stimulate respiration. She also should shear the umbilical cord with her teeth.

If the bitch does not tear the sac away from the pup and stimulate respiration, we must do it. Tear the sac away with your fingers, use a bulb syringe to suck fluid out of the pup's nose and mouth, and vigorously rub the pup with a towel. Blowing air into the nose may help to provide oxygen to the pup. Insertion of a needle into the tissue between the nostrils and twisting the needle as it hits bone may stimulate respiration. The umbilical cord can be tied off with sewing thread or dental floss. Tie off the cord about 1 inch away from the pup's body and again 1 inch from there. Cut between the two ties, and clean the exposed tissue with a disinfectant such as iodine.

Bitches that appear to be slowing down in labor may be becoming fatigued. Walking the bitch may stimulate uterine contractions. Some bitches will eat during labor, and this boost in calories might be beneficial. It may take up to 4 hours for the first pup to be born, and puppies should be born within 2 hours of each other. Intervention is recommended if the bitch has had intermittent straining for 4 hours with no pups born, hard and constant straining for 30 minutes with no pup born, or if it has been more than 2 hours between pups. Accurate record keeping is essential.

Stage 3: In this stage, there is expulsion of the placenta, which takes place 5 to 15 minutes after the

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delivery of the fetus. Multiple placentas may be passed after several puppies are delivered close together. It is not uncommon for the bitch to bite the amniotic and allantoic membranes, severe the umbilical cord, and ingest the placenta after parturition.

The dam's whelping date may be determined using breeding dates, time of luteinizing hormone (LH) peak, ovulation date, or the first day of diestrus. Gestation duration in the bitch is approximately 57 to 72 days (average: 65 days) when established using breeding dates. This period varies because the postcoital viability of canine sperm is at least 6 days and because the ovulation date may not have been identified using progesterone or LH assays. Parturition occurs 63 days after ovulation and 64 to 66 days after the LH peak. The gestation length after the first day of diestrus is 56 to 59 days, but this date is rarely known for dystocia patients. Once the appropriate gestation time has passed, the complex cascade of events leading to delivery begins.

Postpartum findings in the bitch may include mild fever, transient vomiting, and diarrhea, and lochial discharge. Lochial discharge, produced by hemoglobin breakdown, is normal after parturition and is associated with uterine involution. The discharge is green to red-brown, odorless, and persists for up to 6 weeks.

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