Bio Vet Innovator Magazine

Volume 1 (Issue 6) December 2024

OPEN ACCESS

Popular Article

Single Puppy Syndrome: Etiological Factors, Symptoms, Diagnosis and Management

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DOI: https://doi.org/10.5281/zenodo.14602817

Received: December 31, 2024
Published: January 03, 2025

Abstract:

Dogs are polytocous animals with a litter size of 3-7. Dogs may have singleton pregnancies with a prolonged gestation period. The syndrome can be fatal for both the puppy and mother due to birth complications. Factors contributing to single puppy syndrome include breeding older animals, mating timing, early gestational embryo loss, hypoluteodisim, and embryo resorption. Confirmative diagnosis is done by ultrasonography and radiography. Treatments include appropriate housing, proper time of mating, food, and medication.

Key words: Hypoluteodisim**,** Singleton pregnancy, Whelping, Ultrasonography

Introduction:

Dogs are polytocous animals, with an average litter size ranging from three to seven puppies. However, in some instances bitches may have a single fetal pregnancy, which is known as “single pup syndrome (Suresh, 2018).” It is most commonly seen in Scottish terriers and is typical in toy breeds and brachycephalic dogs like pugs and Chihuahuas. In giant breeds of dogs, such as German shepherds and Saint Bernards, this syndrome is rare. Due to difficulties during birth caused by the large size of the pregnancy, single puppy syndrome can be fatal for both the puppy and the mother. There are multiple etiological factors that contribute to single puppy syndrome, such as breeding older animals, time of mating, early gestational embryo loss, and embryo resorption prior to mineralization (Bojja et al., 2024). Because improper mating timing reduces conception rates and increases the

risk of premature abortions, choosing the ideal time to mate is crucial for both conception and producing the greatest number of healthy pups. Mating after the age of seven also increases the risk of producing fewer puppies, or occasionally just one litter. Hypoluteodisim is the primary cause of single puppy syndrome. This refers to the luteal tissue's lack of volume and activity, which causes an inadequate release of the progesterone hormone. At any point throughout pregnancy, fetal mortality and embryo absorption result from a progesterone deficiency (Domoslawska et al., 2011). Following the end of the heat period, the corpus luteum, a tissue found on female animals' ovaries, secretes progesterone, the primary hormone responsible for conception in animals. Many causes of progesterone deficiency can be resolved with different management techniques, such as appropriate housing and food arrangements or veterinary-recommended medication treatments. In single pup syndrome, the fetus may not release sufficient cortisol to trigger the secretion of PGF2α from the endometrium, which starts CL regression and whelping (Pitroda et al., 2019). Dog dystocia is frequently caused by uterine inertia brought on by single pup syndrome. Fetal death occurs in utero when the fetus surpasses its due date because it will require more nourishment than the placenta can provide (Ganesan et al., 2017).

Clinical Symptoms:

Clinical symptoms include a prolonged gestation period, nesting behavior, restlessness, inappetence, subnormal rectal temperature, tachypnoea, and engorged mammary glands, and vaginal discharge may or may not be present, and some fetal parts may also be found in the birth canal.

Diagnosis:

Ultrasonography or radiography can be used to diagnose pregnancy. It is advised to use radiography since it can only determine pregnancy status after 45 days, when bone growth is complete. Ultrasonography is recommended for diagnosis of single puppy syndrome because it can identify pregnancy at an early stage of the embryo. Regular progesterone tests can confirm the diagnosis of hypoluteodism following pregnancy. Although progesterone levels typically range from 35.7 to 29 ng/ml, deviations from this range can lead to hypoluteodisim and single puppy syndrome. Hypoluteodisim is the main cause of single puppy syndrome in the German shepherd dog breed (Domoslawska et al., 2011). Single puppy syndrome frequently results in longer labor or a longer pregnant period. This could be the result of a lack of cortisol-releasing factor, which is basically necessary for pregnancy termination (Pitroda et al., 2019).

Treatment:

In order to relieve the fetus, medical management administered intravenous

injections of 5-20 units of oxytocin, 25% dextrose, 0.5 ml/kg of calcium gluconate (10%), and ceftriaxone/cefotaxime (15-25 mg/kg B.W.), followed by cervical feathering (LindeForsberg and Eneroth, 2000; Pretzer, 2008). It is advised that the owner wait the next 24 hours for the fetus to be expelled. If she did not respond to the first therapy. The same treatment will be administered again the next day, and one dead fetus may be delivered after treatment. If she does not expel the single fetus, then the only choice is a caesarean section. Following whelping, the animal should be administered an antibiotic for three consecutive days. In order to prevent future licking, the owner should be instructed to keep the animal on an E-collar, drain the milk from the gland, and apply vinegar to the mammary gland.

Preventive Measures:

There are several management techniques that can be used in addition to treatment to prevent the illness or possibly save the pet's life. This demands breeding of dogs during the ideal time of their heat cycle. A technique known as exfoliative vaginal cytology can be used to determine the best time to breed. It is recommended that female dogs older than seven years old either not mate or, if they do, their hormone levels should be monitored during the pregnancy. Additionally, in order to prevent contagious infections, pregnant dams should be managed with the highest precision and hygiene. Furthermore, a veterinarian should be called for additional diagnosis and treatment, and recommended therapy should be followed systematically.

Conclusion:

Single pup syndrome is considered a high-risk pregnancy because the single fetus has a lower cortisol level, which is inadequate to commence luteolysis after or before the expected date of partition. Ultrasonography and radiography are useful tools for early diagnosis. 20% dextrose, 10% calcium, and oxytocin intravenously can be used to successfully induce whelping as part of medical care. If Bitch fails to deliver puppy, then we perform a caesarean section.

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