Pregnancy & Whelping

MANAGEMENT OF THE BITCH AFTER ARTIFICIAL INSEMINATION

Implantation & Pregnancy

Implantation of embryos occurs 16 – 18 days after the LH surge in dogs, which equates to 11-14 days after insemination. If travelling is required by the bitch it is ideal for this to occur before the time of implantation (i.e. soon after the insemination).

Placentation in the bitch is described as "zonary" as the point of contact of the lining of the uterus is in the shape of a band or "zone". These bands on the placenta form to allow nutrient transfer from dam to foetus. Their for breeding is that, when separated, a green discharge is noted from the vulva – this indicates the puppy is no longer getting the nutrients and oxygen required for survival.

PREGNANCY DIAGNOSIS

Ultrasonography

The embryonic sac is visible from about 18 days after A.I on ultrasound. However, to assess fetal viability (detection of foetal heart beats) it is best to scan 25-30 days after LH 0 or 25 days after AI.

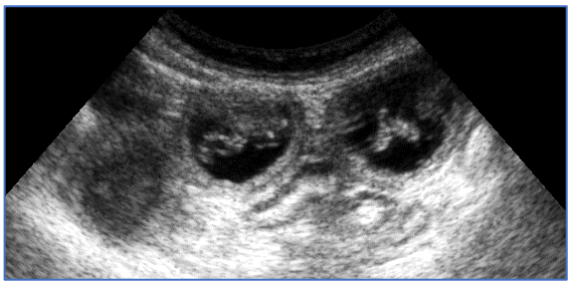

Figure 1: 2 x foetuses on ultrasound (30d)

Determination of the exact number of puppies in a litter by ultrasound is not 100% reliable, especially for large litters (>8 pups). It does however give a good idea as to the approximate litter size.

"Resorption sites" can also be detected at 25-30 days after LH 0. This is very important information for documentation of your bitch's fertility and determination of underlying causes for small litter size and failure to become pregnant.

Radiology

X-Ray examination in the last week of pregnancy (visible > 45 d of gestation) can be used to accurately determine foetal numbers, which is very helpful information prior to whelping. It is important to determine if your bitch only has 1-2 puppies as she will require greater management and possibly an elective C- section (see below).

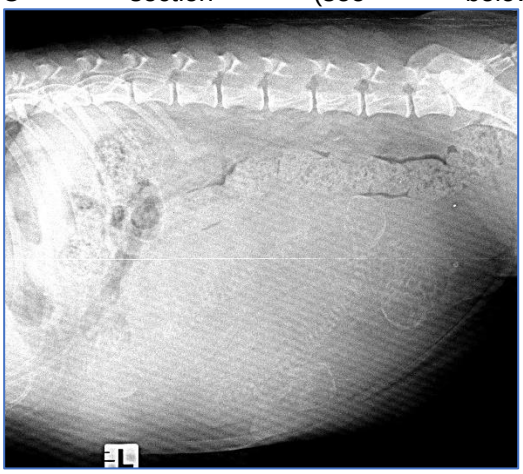

Figure 2: Radiograph showing spines and skulls of foetuses (60d)

CARE OF THE PREGNANT BITCH

Vaccination

It is preferable to have bitches up to date with vaccinations prior to breeding. Vaccines (especially modified live vaccines) should be avoided during pregnancy and only be administered if there is substantial risk of an infectious disease.

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Worming

It is advisable to worm the pregnant bitch 2 weeks prior to her due date, 2 days post whelp and 2 weeks post whelp to prevent spread of intestinal worms to the litter. Ensure the wormer used is licensed for use in pregnant bitches. If you have any concerns please read the label or contact VRC. Puppies should be vaccinated once strong enough (usually from 2-3w of age).

Housing

It is particularly important during the last 3 weeks of gestation that your bitch is housed in familiar surroundings with minimal exposure to pathogens (viruses, bacteria, parasites). These can be introduced by other dogs or humans and can cause abortion, stillbirths and neonatal death.

Nutritional Requirements

The most common error is to overfeed bitches during early pregnancy and underfeed during lactation. During the 1st month of gestation bitches should be fed their regular amount of a commercial, maintenance diet. We recommend Hills or Royal Canin.

During the last month of gestation, food intake should gradually increase by 30 - 40% (depending on foetal numbers). Introduction of a commercial puppy food should commence at this time via gradual introduction of the diet over 1-2 weeks.

Multiple small meals are the best way for your bitch to get all her nutritional requirements as her stomach capacity may be reduced.

Supplementation with Folic Acid (aka Folate) is recommended from the time of breeding until day 40 gestation, particularly in brachycephalic breeds, with its administration shown to reduce the incidence of cleft palate deformities in puppies. It is not recommended to supplement your bitch with any other additional nutrients, vitamins or minerals during pregnancy as this unbalances the nutrition provided by the commercial diet and may adversely affect your bitch and the pups. It is particularly important not to supplement your bitch's diet with calcium.

Exercise

Moderate exercise is to be encouraged throughout gestation to maintain your bitch's body condition. It is important for a successful and complication free whelping that your bitch is fit and not fat.

Drug Administration during Gestation

Ideally you should avoid any drug administration during your bitch's gestation period. If your bitch requires medication for a pre-existing condition or for an illness that arises during pregnancy please discuss this with us at VRC. It is particularly important to avoid the use of steroids.

Predicting the Onset of Labour

Being prepared and well organised prior to your bitch's whelping will help predict, reduce and efficiently and successfully manage any complications that may arise. This is especially important if your bitch has a history of "dystocia" or problems at whelping. Tools used to predict this onset include:

1. Breeding Dates

Labour may begin anywhere from 57 to 72 days from the 1st day of mating if no progesterone timing has occurred.

2. Behaviour and Lactation

Bitches can start 'nesting' 5-7 days prior to giving birth. The onset of lactation can occur anytime from 2 weeks to just prior OR after whelping.

3. LH Surge (LH 0)

Labour begins after 65 +/- 1 days from the LH 0 date in most breeds. (If we have undertaken accurate ovulation timing we will predict the whelping date using this information.)

4. Rectal Temperature

In 80% of pregnant bitches, a significant and abrupt temperature drop of >1°C or below 37.5°C will occur 12-24 hours prior to the onset of labour. To ensure the greatest likelihood of detecting this drop it is best to begin taking the bitch's rectal temperature twice daily at the same time every day for the week prior the expected due date.

5. Serum Progesterone

Progesterone concentration acutely drops to <2ng/ml 24 hours prior to the onset of parturition and can be vital in ensuring bitches are ready to proceed with labour if a C section is thought to be indicated. Monitoring of this drop should be evaluated via communication with VRC as it does not occur in all litters and is especially uncommon in small litters of 1-2 pups.

PREPARATION FOR WHELPING

Whelping Kit

In preparation for whelping it is advisable to be prepared for all circumstances with a whelping kit containing:

- Examination gloves
- Sterile lubricant
- Small scales
- Puppy collars (to identify puppies for weigh-ins and monitoring)
- Clean, warm towels
- Heat pads/hot water bottles
- Paper towels

Whelping Area (e.g. Fig 3)

- A familiar environment
- Free from draft, moisture, excessive cold or heat
- Clean & disinfected
- Minimal traffic; Minimize any contact with visitors or other dogs
- Introduce pregnant bitch to the whelping area 7-10 days prior to her predicted whelping due date
- Rails (as pictured) to prevent both puppy escapees and the opportunity for the dam to crush or suffocate the pups.

Figure 3: Example of whelping box

MANAGING PARTURITION & LABOUR

It is important to be familiar with the normal events/stages of whelping so that you are then able to recognise the early signs of "dystocia" and seek immediate veterinary advice/assistance to prevent loss of neonates.

It is very important that the bitch has minimal external disturbance (including by you the owner) prior to and during whelping as interference can delay the delivery of pups and result in an increased number of "stillbirths".

Stage 1

The cervix starts to dilate and synchronous uterine contractions move the pups into the birth canal. These uterine contractions are not visible externally.

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This stage may be associated with restlessness, panting, shivering, apprehension (especially in a maiden bitch), inappetence and nesting behaviour. This stage usually lasts approximately 12 hours.

Stage 2

The cervix is fully dilated and strong, visible abdominal contractions/straining results in the passage of pups through the birth canal and rupture of the "allantoic sac" producing clear foetal fluids. The first pup is usually delivered within 15 minutes after the onset of strong abdominal contractions. On average 1 pup is delivered every ½ to 1 hour but there is significant variation between breeds and individual bitches. 40% of pups are born backwards which is normal.

Stage 3

The placenta is usually expelled 5-15 minutes after the delivery of each pup. Sometimes 2 or 3 pups will be delivered before the placentas are passed. It is important to account for each placenta as a retained placenta can make the bitch very sick (i.e. ensure # pups = # placentas passed).

GUIDELINES FOR SEEKING VETERINARY ATTENTION DURING PARTURITION (IF…)

1 The bitch has **reached her due date for whelping without any signs of labour or temperature drop**. This is particularly important if she is pregnant with only 1-2 pups (determined by X-ray or ultrasound).

2 The first pup has not been born **within 20-30 minutes after the onset** of strong and forceful abdominal contractions

3 Strong and frequent abdominal contractions occur but fail to result in expulsion of a pup within **15-30 minutes.**

4 Weak or intermittent abdominal straining that fails to result in the birth of the first puppy **within 2 hours or when the interval between the delivery of two pups in greater than 2 hours**.

5 A **green-blood tinged vulval discharge** without the birth of a pup or at any stage of pregnancy.

POSTNATAL MANAGEMENT

Care of the Bitch

Normal suckling by the pups causes the bitch to produce the hormone "oxytocin" which stimulates uterine contractions, involution and milk production. In some cases exogenous drug therapies may be required to assist in milk production and letdown. However, this should only be done under veterinary advice and supervision.

Take the bitch's temperature daily for 1–2 weeks following birth. An increased temperature may indicate an inflammatory or infectious process occurring in the mammary glands, uterus or can also be associated with the condition, "eclampsia".

It is important to check your bitch's mammary glands daily for any heat, pain, skin discolouration or the production of brown, pus-like material from a teat or teats. Also check daily for any purulent or pungent vulval discharge.

It is normal for a bloody-brown, non-odorous discharge to be present from the vulva for 3 weeks post partum. However, in some cases this discharge can continue for longer (up to 3 months!).

The suckling bitch may need to eat three times her normal food intake to provide enough energy for milk production. She should continue to be fed her puppy food ad lib or at least 3 – 4 times daily until the puppies are weaned. Weigh the bitch weekly and observe closely for excessive weight loss.

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Care of the Neonates

A healthy neonate should be fat and sleek and sleep contentedly when not nursing. Puppies that are frequently crying and crawling around constantly indicate there may be a problem.

1. Weight

Body weights should be accurately measured and recorded at birth, daily for 2 weeks & then every 3 days until 1 month of age. Puppies are expected to lose 10% of their body weight in the first 24 hours of life. From then on puppies should increase their body weight by 10 % per day and double their birth weight by 10-12 days of age. Puppies less than 6 weeks old are very prone to dehydration and one of the first indicators is weight loss.

2. Temperature

Care must be used in the provision of a heat source. In the first 3 weeks of life pups cannot regulate their own body temperature so they rely on the bitch and the environment for sufficient warmth. A good mother will provide most of the required heat by presenting the skin of the mammary area against which the pups huddle. If the bitch doesn't leave the pups for long and they are strong and feeding well, the room temperature only needs to be about 22°C - 24°C.

An external heat source is needed in cooler weather, if the mother does not stay with the pups enough or if the pups are orphaned. For orphan pups in the first week of life, temperature should be kept at 30°C-32°C. This can then be reduced to 22°C-24°C over the next couple of weeks. The best heat sources are a pet electric blanket or a heat. Hot water bottles cool easily and need to be changed often. When they are hot they need to be heavily wrapped to prevent skin burns, and on cooling it can lower the pup's body temperature further.

Extreme care must be taken when heating pups – always check the temperature with a thermometer placed at pup level in the box and allow the pups space to move away from the heat source. Pups that get too cold will die, but so will pups that get overheated.

3. Hypoglycaemia (low glucose levels)

Neonates have minimal fat reserves and limited metabolic capability to generate glucose and are therefore susceptible to developing hypoglycemia.

4. Nutrition

Of course in most instances, the bitch will take care of this for you. However some bitches or large litters may require supplementary feeding or in some situations if the bitch becomes unwell entire litters may need to be hand raised, which is very intensive and hard work especially in the first 2 weeks.

Signs of underfed puppies:

- Crying and whimpering
- Restlessness and not sleeping
- Losing weight
- Become hypothermic (cold) easily
- Can develop low blood glucose leading to depression and coma
- Dehydration

When supplementary feeding, use a commercial puppy milk replacer or formula and strictly follow label instructions.

Newborn puppies should be fed about 10ml every 4 – 6 hours gradually increasing by about 1ml per feed. Most puppies will suckle from a bottle with a human neonatal teat. Great care must be taken when feeding a puppy stomach tube as many complications can result from doing this and ultimately loss of pups can occur. We recommend this be done only under veterinary supervision.