How to Manage Dystocia and Perform Neonatal Resuscitation

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Initial triage

The first step in managing a dystocia is usually recognizing a potential dystocia by the description the client is giving you over the phone. Often these calls seem to come during emergency hours, necessitating you to make a judgment call as to whether the owner should pack up a mother dog in labor, potentially with some puppies that have already been born, and drive to your clinic, which may be some distance from where the client lives. Knowing the range of normal parameters for whelping dogs is critical to making a good recommendation. The following is a list of abnormalities that may be described and warrant having the bitch come in for evaluation:

- Gestation has been determined by LH surge or ovulation detection and the bitch is more than 2 days overdue.
- A drop in serum progesterone was documented (< 2 ng/mL) over 24 hours ago.
- A drop in temperature below 98° C was documented over 24 hours ago.
- The bitch has started whelping and has been straining for more than 15 minutes without a puppy being born.
- The bitch has started whelping, has given birth to some puppies, has been resting comfortably without any abdominal contractions for over three hours with no more puppies being born (and it there is a question as to whether more are still *in utero* or not).
- A malodorous discharge is noted during whelping.
- Marked bleeding is noted.
- The bitch is nonresponsive or otherwise showing signs of shock.
- The bitch is crying out as if she is in pain.
- The bitch has been in stage 2 labor for over 24 hours (even with a large litter).

Any of these situations warrant having the bitch come in for an evaluation. Clearly, some of them can wait till the next day, if the call has come after hours (the first three situations in the above list). Other situations require immediate intervention and should not wait till morning (all the other situations from the above list).

Differential diagnoses

Reasons for dystocia can be separated into maternal and fetal causes. These are listed below in decreasing order of frequency and are discussed individually later in this review.

Maternal factors

- Primary uterine inertia
- Secondary uterine inertia
- Narrow pelvic canal
- Uterine torsion
- Hydrallantois
- Vaginal septum
- Vaginal prolapse

Fetal factors

- Maldispositions
- Malformations
- Fetal oversize
- Fetal death

History

When the bitch arrives at your clinic, you must work quickly by getting a concise history and performing a quick, but thorough, examination. Your history should include:

- When was the bitch bred?
- Was a breeding management conducted to determine the LH surge or ovulation date?
- Did the bitch have a normal pregnancy?
- Were radiographs performed to determine the litter size?
- When did whelping start?
- How many puppies have been born so far?
- How long did she push before each puppy was born?
- How long of an interval was between each puppy?
- Did the owners attempt to help deliver any of the puppies?
- Did the owners give the bitch any medications? (Some breeders keep oxytocin at home).

These questions will help you determine if the whelping is occurring within the window of time expected for normal whelping, how many puppies remain to be born, and an initial idea of how to rank your differential diagnoses.

Diagnostic tests

A quick and focused physical examination should be performed, which, of course, should include a digital, vaginal examination with a gloved, lubricated finger to determine if the vaginal canal is free from obstructions. Obstructions may include a fetus, a vaginal septum, or a soft tissue tumor. Any obstruction will make medical treatment of the dystocia contraindicated. Palpation of the abdomen will help determine if any fetuses are left in the uterus.

Imaging diagnostics should also be performed. Radiographs are indicated if the dystocia is non-obstructive and medical treatment is to be attempted. Radiographs will allow you to count the number of fetuses present and therefore know when medical treatment has been successful. If the plan is to perform a C-section, radiographs offer very little advantage. Ultrasound is always a valuable tool as it, alone, can give you an indication as to the health of any fetuses remaining in the uterus. Fetal movement and heart rates may be determined. Fetal heart rates < 150 bpm indicate fetal stress. Fetal heart rates < 130 bpm indicate an immediate need to perform C-section for the best prognosis.

If C-section is the determined course of treatment, the routine blood tests should be run to help screen for anesthetic risks.

Checking blood glucose is helpful as hypoglycemia may cause dystocia. While not common, it is seen occasionally in toy breeds and is easily corrected with IV fluids with dextrose.

Checking blood calcium is rarely helpful as clinically hypocalcemic dogs frequently will register within the normal range on blood tests. If uterine inertia is suspected, it is best to assume hypocalcemia and treat according.

Treatment

If the obstruction is a maldispositioned fetus, attempts may be made to perform mutations to correct the fetal malpostures. This is often much more easily said than done, as very little room is available for manipulations and usually only one or two fingers may be introduced to try to reposition the fetus. Instruments should be used with caution because they can easily cause severe blunt trauma to both fetus and dam. As with any species, correction of maldispositions in the dog requires lots of lube and clean, gentle manipulations.

Obstructive dystocias, as well as uterine inertia, may always be treated with C-section and this is often the best option. If C-section is chosen, choosing the right anesthesia is critical. Propofol is a relatively safe induction agent as it is quickly metabolized, even in the fetal system. The same is true of inhalant agents such as isoflurane or sevoflurane. Always avoid ketamine and barbiturates and alpha-2 agonists should be used with extreme caution, as they have been associated with decreased fetal vigor and viability. Opioids are potent analgesic agents, but should be used judiciously. Choice of an opioid that is short-acting and has less of a respiratory depressive effect, such as butorphanol, is preferred. Alternative plans for opioids would include planning on using naloxone to reverse the fetuses as they are removed, or refraining from giving the opioid to the dam until all the fetuses are removed. Alternate analgesic agents, such as a local lidocaine block, may be safely used prior to removing the fetuses.

Medical treatment of dystocias may be considered as long as an obstructive dystocia has been ruled out by digital examination of the vaginal canal. It is a good idea to treat first with calcium gluconate, since oxytocin will not be able to cause the desired effect in a hypocalcemic animal. Calcium gluconate may be given via multiple routes, including oral, subcutaneous, intraperitoneal, or intravenous. The intravenous route is the most direct and fastest, but must be done with care to avoid inducing a bradycardia. The calcium gluconate should be diluted down in a 1:1 ratio with saline and given very slowly, while monitoring the heart. After calcium has been administered, oxytocin may be given either intravenously or intramuscularly at a dose of 1-5 U/dog. This may be repeated every 30 minutes until effect. If 3 doses have been given an no effect is noted, it is unlikely that oxytocin therapy will work and a C-section should be considered.

Neonatal resuscitation

Puppies born via C-section will frequently require resuscitation. The most important factors in reviving neonates after a C-section are warmth, oxygen, and mechanical stimulation. The use of warm water bottles wrapped in thin towels can be very effective. Some have used exam gloves filled with warm water, but you must be careful that they do not burst. Others have used warm air blowers, such as a Bair Hugger ®, which work very efficiently, though concern has been expressed about dehydrating the neonates with these systems, so care should be taken. Plenty of dry towels should be on hand to continually rub the neonates. Gentle, but firm, rubbing of the thorax will help stimulate breathing. A suction bulb should be used to clear mucus from the nose and oral cavity. Neonates should NOT be swung, as this has been shown to induce cerebral hemorrhage in some neonates. Having free flow oxygen on hand will help revive neonates, as well.

One important key to reviving neonates is to not give up prematurely. It is not uncommon to work with neonates for up to 30 minutes or more before the neonate will start breathing.

Having a good anesthetic protocol that avoids fetal exposure to respiratory depressants is one important factor in being able to revive neonates. If opioids have been used as a premedication (especially ones other than butorphanol), having naloxone on hand to administer to neonates is critical. One drop given sublingually is usually sufficient to reverse the opioid exposure.