

Canine Uterine Disease: Pyometra

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Canine pyometra is considered an emergency in veterinary practice due to the life-threatening nature of the condition. Indeed, many veterinary students are taught the mantra, "Don't let the sun set on a pyometra." This is good advice for some clinical cases of pyometra, but is not applicable to every case. Depending on the severity of the condition, whether it is an open or closed pyometra, and how early the clinical signs are noticed and the dog is presented to a veterinarian, the time schedule for when, or if, to perform surgery varies. The fact that most dogs develop this condition over days indicates that many suns set on many pyometra cases before they become clinically obvious or life-threatening. Therefore, if an astute, observant client notices early signs of the condition, brings the dog to the veterinarian, and a diagnosis is made early on, performing surgery that day may not be necessary. Surgery may not be necessary at all if the owner desires more puppies and the bitch is clinically stable and otherwise healthy. Responsible medical treatment can often safely resolve the situation.

It is also prudent to consider the dogs that present later in the progression of the disease and are clinically very ill and unstable. Some of these dogs may be very dehydrated and suffering from the effects of endotoxemia. Such patients are at high risk for anesthesia and surgery. It may be a much more responsible clinical decision to attempt to stabilize the patient with intravenous fluids and antibiotics, along with preliminary treatments aimed at draining the uterus. After the patient is more stable, which may be as soon as overnight, surgery to remove the uterus would be indicated.

Recent reviews covering the pathogenesis and treatment of pyometra have been published[1,2]. When an intact bitch presents with nondescript clinical signs that may include anorexia, lethargy, depression, polyuria, polydipsia, vomiting, or diarrhea, one of the top differential diagnoses should include pyometra. Physical exam may reveal a tense, distended abdomen, mucopurulent vulvar discharge, or signs of dehydration. Imaging usually produces the definitive diagnosis, with ultrasound being more sensitive than radiography, especially in cases of open or partially closed pyometra cases where the amount of fluid in the uterus and consequent distention will be less than in closed pyometra cases.

Once pyometra has been diagnosed, the clinician should first assess the stability of the patient to be able to best advise the client. Laboratory findings of a peripheral leukocytosis are common. Indications of prerenal azotemia are likely due to dehydration. Endotoxemia may damage the kidneys, however, and this should be investigated. If the bitch has an elevated heart rate, increased or decreased temperature, increased respiration rate, and increased white blood cell count, sepsis should be suspected. The clinician must decide if the patient is stable enough to be a decent anesthetic and surgical candidate, or if measures to stabilize the patient should be taken first.

If the patient is considered to be stable, the clinician should ask the client about their intentions to breed the animal. This can be a very contentious subject with many veterinarians, since we all recognize the pet overpopulation problem in our country. Without delving into an ethical discussion, but recognizing that some responsible breeders do exist, this review will focus on the medical aspects of such cases. The fact of the matter is that if a particular bitch with a pyometra is otherwise clinically stable, bright, alert, responsive, with a good appetite and well-hydrated, beginning medical treatment can have a very positive outcome, avoid surgery at the moment, and may allow the bitch to have one more cycle during which breeding should be attempted. To tell a client that ovariectomy is the only option for all bitches with pyometra is to use ethics as an excuse to tell a lie, which is just a bit ironic. It would serve our profession much better to instruct the client honestly about the risks of each option available.

If ovariectomy is the treatment of choice, once again, the clinician should be very careful to make sure that the patient is stabilized prior to anesthetic induction. While *E. coli* accounts for about 70% of pyometra cases in the bitch, other bacteria, including Gram positive bacteria such as *Streptococcus* spp. and *Staphylococcus* spp., may cause the condition. A culture of the vulvar discharge, if present, should be taken. If no discharge is evident, culture of the uterus after removal is indicated. In the meantime, intravenous fluids and broad spectrum antibiotics should be instituted. If the surgery is to be postponed for a day or more while the patient is stabilized, treatments to open the cervix and drain the uterus should also be implemented. In the United States, these treatments should include dopamine agonists (to reduce prolactin, which is luteotropic in the bitch) and prostaglandins (to lyse the CL and produce uterine contractions). Doses are listed below.

If the owners of the dog desire to avoid surgery at the present time, either because they would like to pursue surgery later when the dog is more stable or they desire to attempt another breeding of the animal, they should understand that medical treatment involves hospitalization and expenses roughly equivalent to surgical treatment. If the decision is then made to treat the dog medically, the animal should be admitted to the hospital and placed in the intensive care unit. An intravenous catheter should be placed and fluids and broad-spectrum antibiotics administered, as discussed above. Treating dogs with closed pyometra medically is not usually advised, though it has been done successfully (see treatment recommendations below). Most medical candidates, however, have open pyometra and therefore cultures may be submitted prior to starting antibiotic therapy. These dogs are also started on low doses of

prostaglandins, accompanied by dopamine agonists. The doses of each may be increased if the dog responds well. Daily monitoring with ultrasound will help gauge the effectiveness of the treatment at removing fluid from the uterus.

Complications that are seen from medical treatment of pyometra include the short-term side effects from prostaglandin administration, which are usually gastrointestinal, decreased fertility on subsequent cycles, and recurrence of the pyometra. Recovery rates reported range from 40% to 90% and seem to be strongly correlated with the severity of the disease in individual dogs treated. It therefore weighs heavily on the clinician to judge the severity of the systemic effects of the condition.

If medical treatment of pyometra is successful, treating the dog with an androgen, such as miltenerone, to prolong the interestrus interval and therefore allow a longer time for the uterus and other body systems to recover before another estrous cycle is encountered, is wise. The owners should plan on breeding the dog on the next cycle and then should plan on spaying the bitch after that cycle to avoid a pyometra in subsequent cycles.

In countries outside the United States, other drugs, such as the progesterone receptor antagonist aglepristone, are used with good efficacy.

Treatment recommended for open pyometra in the United States:

1. Cabergoline (a dopamine agonist): 5 µg/kg PO q 24 h for 10 days (give a couple hours apart from #2)
2. Dinoprost (PGF_{2α}):
 - a. 5-10 µg/kg SQ q 4-6 h on the 1st day
 - b. 25 µg/kg SQ q 4-6 h on the 2nd day
 - c. 50 µg/kg SQ q 4-6 h on the 3rd-7th days
 - d. Recheck daily with ultrasound to help determine efficacy

Treatment recommended for closed pyometra in the United States (if surgery is not an option):

1. Cabergoline (a dopamine agonist): 5 µg/kg PO q 24 h for 10 days (give a couple hours apart from #2)
2. Dinoprost (PGF_{2α}):
 - a. 5-10 µg/kg SQ q 4-6 h until the cervix is open (as judged by vulvar discharge and ultrasound evaluations)
 - b. Increase to 25-50 µg/kg SQ q 4-6 h for 5-7 days after opening of the cervix
 - c. Recheck daily with ultrasound to help determine efficacy

References

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Pretzer SD. Clinical presentation of canine pyometra and mucometra: A review. *Theriogenology* 2008;70: 359-363.