

Normal canine uterus

Uterus with pyometra

Pyometra panic

Warning signs
and treatment
of a potentially
fatal infection

By Beverly Stanley,
ELS

Katie bred her first show bitch, Missy, who had four beautiful puppies at age 3. Katie bred her again without success, and then tried again at age 5. About a month after the last breeding, Missy was tired, had no appetite, drank a lot of water, and urinated frequently. Her abdomen was swollen and she vomited and shivered. Alarmed, Katie rushed her to an emergency clinic. The veterinarian performed an ultrasound, finding an enlarged uterus. Based on her history and symptoms, he told Katie that he suspected Missy had closed pyometra and recommended an immediate ovariohysterectomy (spay) to save her life.

Pyometra is a hormonally influenced disorder of a uterus infected with bacteria. It occurs more often in bitches over 6 years of age and in those who have never had puppies, but it can occur in any bitch at any age after the first heat (estrus). Between two and eight weeks after estrus, infection causes the uterus to fill with pus. Swelling causes pain and distends the abdomen, and sometimes pus comes through

the cervix and out of the vulva as a blood-tinged, yellow-green, foul-smelling discharge. This is called “open pyometra” and is more easily discovered. The more insidious “closed pyometra” has no outward drainage of pus from the ballooning uterus. In either case, toxins enter the bloodstream and affect the kidneys, causing overall fatigue, thirst, and frequent urination as the pressure causes pain and gastrointestinal symptoms. Rarely, the uterus may rupture, as in appendicitis, or even more rarely, the contents may backflow into the abdomen, causing severe and often deadly abdominal infection.

There may be no initial symptoms with open or closed pyometra, as the infection is first isolated in the uterus. But the bitch may quickly go into shock as the bacterial toxins and infection leak into her system. Immediate treatment is needed, yet symptoms are easily missed. Periodically checking for pus in the usual white or clear vulvar secretions or observing it in the fur near the vulva (or on the bedding) is a red flag. Fatigue, lack of appetite, and abdominal swelling may go

ILLUSTRATION BY KATE MCCROARY

unnoticed or be excused for pregnancy in closed pyometra (as in Missy's case), but vomiting and diarrhea; excessive drinking and urination; a painful, swollen abdomen; and fever (approximately 20 percent have fever) mean an immediate trip to the emergency clinic—don't wait!

Untreated pyometra can be fatal, and immediate surgery may be best for saving the life of a bitch showing severe signs of the disease. Laboratory tests on blood drawn will confirm infection and, more immediately, a vaginal cytology test performed by your veterinarian is an excellent method of diagnosing this condition early on or confirming it after symptoms are observed. Stabilization with intravenous fluids and antibiotic therapy may be necessary before surgery is possible. After surgery, antibiotics will be continued for two weeks or more and will be monitored for symptoms of infection, and kidney, liver, and other organ damage. Missy made a complete recovery after surgery.

What Leads to Infection

Pyometra is not caused by bacteria alone, but from a combination of factors that involve the uterine lining (endometrium), the hormones estrogen and progesterone, impaired immunity, and infective bacteria. In the first phase of estrus, the estrogen level in the blood increases, the vulva swells, becomes warm (thus the term "in heat"), and there's a normal bloody vulvar discharge as progesterone and estrogen cause the uterine glands to grow and thicken to nourish fertilized eggs. As ovulation approaches in the next phase, estrogen decreases and that decrease greatly stimulates the effects of progesterone on the uterine lining. This helps set the stage for pyometra. The lining is reorganized and regenerated, pregnancy or not, but incompletely absorbed in some areas. This can then overgrow under hormonal influence and may cause cysts to form in a condition known as cystic endometrial hyperplasia (CEH). With each cycle, hyperplasia waxes and wanes as the bitch repeats the estrous cycle and it is this process that can lead to pyometra. The mucus secreted by the cysts that form over time inflames the

uterine lining, helping to make conditions right for bacteria to multiply out of control. After ovulation, progesterone decreases the response of white blood cells to sperm to aid in fertilization, but consequently, this action lets the guard down for killing bacteria that may enter the open cervix.

Progesterone also decreases uterine contractions and closes the cervix, keeping sperm inside the uterus and trapping the bacteria there as well. They grow hidden and quickly within the inflamed lining, nourished by mucus and protected from body defenses.

Walter R. Threlfall, DVM, is a theriogenologist (reproductive specialist) at the Department of Veterinary Clinical Sciences, The Ohio State University. He says, "Endometrial hyperplasia probably occurs in all bitches, but the degree to which it occurs varies. It isn't based on the concentrations of the hormones, but on how each bitch 'deals' with those hormones and that may vary with each heat."

Pyometra may affect bitches of any age following estrus, but it is seen more often in mature bitches due to many years of CEH buildup. Because Missy was not bred for almost three years, CEH could have begun before her first litter, building during the following cycles, providing ripening conditions for finally developing pyometra at 5 years. Natural breeding, artificial insemination, or a urinary-tract infection can introduce variably infective bacteria into a susceptible uterus. Administration of estrogen to prevent pregnancy after a "mismatching" or to delay heat presents a significant risk of pyometra.


Alternate Treatments

By the time pyometra is diagnosed, future breeding is questionable. If pyometra is caught early, and the bitch is valuable for breeding, some breeders may opt to treat it with antibiotics. This is not highly successful because infection will continue unless uterine pus is purged. In countries outside the United States,

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treatment includes antibiotics in conjunction with prostaglandins to force uterine contractions to expel the infected contents, but these drugs can cause adverse side effects and careful monitoring is necessary. They should not be used in closed pyometra, as it may cause uterine rupture. Treated bitches have reduced fertility and the chance of recurring pyometra is very high (50 to 75 percent). The bitch must be bred at every cycle thereafter to prevent reoccurrence of pyometra. The U.S. Food and Drug Administration (FDA), however, has not approved these drugs for treatment of canine pyometra in this country.

Threlfall says that in the United States the treatment of bitches with a combination of antibiotics and prostaglandin F2-alpha is an acceptable practice, and he has used it since 1980. Lack of FDA approval is a funding, not a safety issue, he believes, and he treats stabilized bitches who are not severely toxic.

If you do not plan to breed your bitch, spaying is the best way to avoid pyometra. The incidence of this disease increases with time, and the cost of spaying is much less than the emotional cost of losing a beloved pet to a preventable disease. If she is an asset to her breed and you plan litters, be sure to check for symptoms of pyometra, particularly after each estrus, whether she is bred or not. When her breeding days are over, have her spayed. Be sure to discuss these options with your veterinarian. 

Beverly Stanley is a medical editor and writer who has bred and exhibited Silky Terriers and Papillons for over 30 years and currently shows a Toy Fox Terrier.