

# PYOMETRA & CYSTIC ENDOMETRIAL HYPERPLASIA

## **Definition:**

Is a common condition in old unsterilised female dogs where the uterus fills with pus

## **Signs:**

History often includes a heat in the last 4 – 6 weeks, increased thirst and very unpleasant malodorous vaginal discharge (bloody pus)

## **Advice:**

Rapid intensive medical therapy emergency and surgery removal of the uterus is risky but often successful. Early treatment is preferred

## **OVERVIEW**

- Cystic endometrial hyperplasia—hormonally mediated, progressive, abnormal thickening in the lining of the uterus (known as the “endometrium”), characterized by the presence of fluid-filled sacs or cysts
- Pyometra—develops secondary to cystic endometrial hyperplasia or inflammation of the lining of the uterus (known as “endometritis”); develops when bacteria invade the abnormally thickened lining of the uterus (lining of the uterus known as the “endometrium”) and pus accumulates in the uterus
- The female dog is a “bitch”; the female cat is a “queen”

## **SIGNALMENT/DESCRIPTION OF PET**

### **Species**

- Dogs—genetic predisposition in some related lines, suggested for Bernese mountain dogs, rottweiler, rough-coated collie
- Cats

### **Mean Age and Range**

- Usually greater than 6 years of age (range 4 months to 16 years of age in dogs)
- Young pets—especially if treated with female hormones (estrogen) or progestogen (any substance capable of producing the effects of the female hormone, progesterone)
- Dogs—usually diagnosed 1–12 weeks after “heat” or “estrus”
- Cats—onset relative to “heat” or “estrus” more variable, usually within the 4 weeks following heat

- Accumulation of pus in the uterine stump (known as “pyometra of the uterine stump”) in spayed pets—may develop any time after surgical removal of the ovaries and uterus (known as a “spay” or “ovariohysterectomy”)

## **SIGNS/OBSERVED CHANGES IN THE PET**

- Closed cervix (the “cervix” is the lower part of the uterus that extends into the vagina [the tubular passageway or birth canal, leading from the opening of the vulva to the cervix]; a “closed cervix” is one in which the muscles surrounding the cervix are contracted and the opening into the uterus is “shut” so no pus or discharge can drain from the uterus; uterus is enlarged with closed cervix (where the pus or discharge cannot drain from the uterus); may not be enlarged with open cervix (where the muscles surrounding the cervix are relaxed, allowing the opening into the uterus to expand and pus or discharge to drain from the uterus, through the vagina and vulva [external genitalia])
- Closed pyometra signs include: depression and sluggishness (lethargy), lack of appetite (known as “anorexia”), increased urination (known as “polyuria”) and increased thirst (known as “polydipsia”), vomiting, abdominal distension; signs of generalized (systemic) illness, progressing to signs of generalized disease caused by the spread of bacteria in the blood (known as “septicemia” or “blood poisoning”) and shock
- Discharge from the vulva—if cervix is open, discharge may be bloody and/or may contain pus
- May or may not have fever

## **RISK FACTORS**

- Old, ovary-intact females that have never given birth may be predisposed; an “intact female” has her reproductive organs and is capable of reproduction
- Pharmacologic use of estrogen (“mismate”) shots during particular times of the “heat” or “estrous” cycle
- No correlation with “false pregnancy” or “pseudopregnancy” in dogs (in other words, a bitch with a history of false pregnancy is not at greater risk of developing cystic endometrial hyperplasia and/or pyometra than a bitch that has not had a false pregnancy)
- Use of progestogen medicine in queens and bitches

## **CAUSES**

- Dogs—repeated exposure of the lining of the uterus (endometrium) to estrogen followed by exposure to progesterone with each “heat” or “estrus” without pregnancy; this hormonal pattern is unique to the bitch
- Cats—may be the result of estrogen at “heat” or “estrus,” followed by a progestational phase (pseudopregnancy), caused by induction of release of eggs from the ovaries (known as

“ovulation”) through breeding, spontaneous ovulation, or other hormonal stimuli (hCG, GnRH)

## TREATMENT

### HEALTH CARE

- Inpatient
- Accumulation of pus in the uterus (pyometra)—life-threatening condition if the cervix is closed (where pus or discharge cannot drain from the uterus)
- Supportive care—immediate intravenous fluid administration and antibiotics

### SURGERY

- Spay is the preferred treatment for all non-breeding females, those greater than 4 years of age, and those with system-wide illness signs
- For pyometra, whether open or closed cervix—surgical removal of the ovaries and whole uterus (spay or ovariectomy) including the cervix will be recommended as soon as the pet is stable
- Accumulation of pus in the uterus (pyometra), with a closed cervix (where pus or discharge cannot drain from the uterus)—caution will be used during surgical removal of the ovaries and uterus (spay or ovariectomy); the enlarged uterus may be very fragile

## MEDICATIONS

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all-inclusive

### ANTIBIOTICS

- Initial antibiotic selected by your pet's veterinarian based on experience, pending results of bacterial culture and sensitivity test
- Will be administered to all pets with inflammation/infection characterized by accumulation of pus in the uterus (pyometra)
- Common choices—ampicillin; cefazolin; if stable with normal organ function, and past the growth phase, may consider enrofloxacin (Baytril®)
- Antibiotics—not effective as the sole treatment, unless the uterus is of normal size and the serum progesterone level is less than 2 ng/ml on blood tests

### PROSTAGLANDINS

#### Prostaglandin F<sub>2α</sub> (PGF<sub>2α</sub>)

- Prostaglandins cause smooth muscle contractions and subsequent emptying of the uterus and decrease in serum progesterone concentration, based on dosage; start with low dose in new

protocol to minimize side effects

- Dogs and cats—for 1 day, then a bit higher dose for 1-2 days, then one more step-up in dose given for 3-4 days
- Surgical removal of the ovaries and uterus (spay or ovariohysterectomy)—performed in pets that do not respond to treatment with prostaglandin (lack of response indicated by continued enlargement of the uterus or presence of fluid in the uterus, or discharge from the vulva is still present after 5 days of medical treatment)

### **CLOPROSTENOL**

- Dogs—injection under the skin (subcutaneous or SC injection) daily for 7–14 days; greater side effects compared to natural form of the hormone

### **MISCELLANEOUS**

- Using a scope to enter the cervix for open and closed pyometra cases; a recently described technique—flush the uterus with warm saline and the PGF2 $\alpha$ ; resolution in 3-5 days; patient selection important
- PGF2 $\alpha$  is used extra-label—your veterinarian will discuss this further
- Aglepristone—effectiveness improved with prostaglandin treatment at the same time; not readily available in the United States; minimal side effects; slow acting
- Cabergoline—for 7–14 days with prostaglandin treatment or bromocryptine, given with food, best used in combination with PGF2 $\alpha$ ; cervix should open in 24-48 hours

## **FOLLOW-UP CARE**

### **PATIENT MONITORING**

- Improvement in signs is expected within 24 hours of start of PGF2 $\alpha$  treatment, within 3 days, ultrasound will show the uterus shrinking—no discharge and no fluid in the uterus on ultrasound is expected within 7 days; serum progesterone hormone levels should normalize in 5-7 days
- Antibiotics—administration will be continued for at least 2 weeks after discharge is resolved and ultrasound confirms the uterus is clear of fluid
- Serial complete blood counts (CBCs)—the white blood cell (WBC) count rises rapidly after surgical removal of the ovaries and uterus (spay or ovariohysterectomy), because the bone marrow continues to release neutrophils (a type of white blood cell) into the bloodstream, from which they can no longer enter the uterus but should normalize in 10-15 days
- Follow-up ultrasound of the uterus 4 weeks after discontinuation of treatment to ensure no fluid

## PREVENTION AND AVOIDANCE

- Do not allow pets to have access to stored anticoagulant rodenticides (rat bait), use well secured bait stations

## EXPECTED COURSE AND PROGNOSIS

- If the pet survives the first 48-72 hours of sudden (acute) blood-clotting disorder (coagulopathy)—prognosis improves

## KEY POINTS

- Anticoagulant rodenticide (rat bait) poisoning is a common problem—many rodent baits are sold over the counter and widely used in homes
- Re-exposure of the pet to anticoagulant rodenticides could be a serious problem
- Do not allow pets to have access to anticoagulant rodenticides

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