

## R – Reproduction

### CANINE PYOMETRA: NEW APPROACHES TO AN OLD DISEASE

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#### Definition

Canine pyometra is the accumulation of purulent secretions in the uterine lumen of sexually intact bitches, with an open (open pyometra) or closed cervix (closed pyometra).

#### Incidence

Pyometra is a common disease. Nulliparous bitches and bitches of more than 4 years of age seem to be predisposed (1). In a colony of Beagles, 15.2% of the bitches more than 4 years of age were affected, whereas the mean age was 9.4 + 0.4 years at the time of clinical signs(2). A Swedish study, based on Animal insurance data, showed that 23.24% of all bitches developed pyometra before the age of 10 years(3). Bernese Mountain dog, Rottweiler, rough-haired Collie, Cavalier King Charles Spaniel and Golden Retriever are listed as predisposed breeds (3).

#### Aetiology

The exact aetiology of the pyometra is still unknown. In the initial phase of the disease process the stimulation of the uterus by endogenous or exogenous gestagens over an extended period seems to play an important role. A canine uterus under the influence of progesterone is susceptible to bacterial infections, as progesterone stimulates the growth of the endometrial glands and their secretory activity, along with cervical closure and the suppression of myometrial contractions (4). In addition, gestagens have an inhibitory effect on the leucocytes in the uterus, adding support to a bacterial infection(5). As progesterone is already the dominant hormone during the oestrus

phase when the cervix is still open, there is at this time an increased risk for an ascending bacterial infection.

To now it has not being possible to induce a pyometra by the application of oestrogen alone. However, the subsequent effect of gestagen is obviously enhanced by oestrogens. This explains why mismated bitches treated with oestrogens, for pregnancy prevention, have a significant increased risk for pyometra.

*Escherichia coli* is the bacteria which is most often isolated, in up to 90% of cases. Certain serotypes are more often isolated and this is presumably correlated with the presence of certain virulence factors. One possible virulence factor is CNF (cytotoxic necrotizing factor), as the production of CNF is associated with extensive endothelial damage and enhanced inflammatory reactions. Bacteriological genotype examinations indicate that pyometra is most likely caused by *E. coli* originating from the normal flora of the affected bitch. That means, that a healthy bitch cannot be infected by transmission of *E. coli* clones of an affected bitch(3).

#### Diagnosis

Most bitches affected with pyometra are presented during the luteal phase of the cycle. Predominant clinical signs are purulent vaginal discharge in case of open pyometra and polyuria / polydipsia. Bitches suffering from a closed pyometra are often presented at a later stage of the disease, when endotoxins absorbed from the uterine lumen have already resulted in a generalised illness. Affected animals usually have an elevated WBC-count, in

many cases they also have a prerenal acotemia, hyperproteinemia and hyperglobulinemia. The preferred methods in establishing the diagnosis are ultrasonography and radiology. Caution: A pregnancy of less than 40 days duration can be misinterpreted as pyometra on a radiograph, but not if an ultrasound examination is performed

### Treatment

In principal, pyometra can be treated by surgical or medical therapy. However, the decision depends on several factors (see table).

Ovariohysterectomy	Medical treatment
Elderly bitches	Younger bitch, intended for breeding
Non-breeding bitch	
Presence of systemic disease	Bitch is in a good general condition
Closed cervix	Open cervix
Bitch is not predisposed to side effects after spaying	Bitch is predisposed for side effects after spaying
Endometrial glandular cysts are demonstrated by ultrasonography	Absence of endometrial glandular cysts by ultrasonography

### Conservative Therapy

For the medical treatment of pyometra varying prostaglandins are mainly used. Over the last few years an anti-progesterone is also available. These can be used as a single treatment or in combination. Additionally, a broad-spectrum antibiotic treatment is recommended. In the literature there are many different treatment protocols. In the following section the proven treatment applied at our clinic will be presented.

#### Conservative therapy during Anoestrus

If the last heat occurred more than 2.5 months ago, the bitches are treated with Prostaglandin F<sub>2α</sub> (PG F<sub>2α</sub>) at 20-30 µg/kg BW (Dinolytic®, Upjohn) tid i.m. PG F<sub>2α</sub> promotes the opening of the cervix and contractions of the myometrium. Within the recommended dose rate side effects are rarely observed and the duration of treatment, until the complete emptying of the uterus, is 5 – 8 days(6). At the same time a broad spectrum antibiotic or chemotherapeutic is given per os for 3 weeks.

A week after beginning the therapy an ultrasound examination of the uterus is recommended.

#### Conservative therapy during Metoestrus

If the bitch is presented within 2.5 months after the last heat a combination therapy of the progesterone antagonist, Aglépristone and Prostaglandin F<sub>2α</sub> (PG F<sub>2α</sub>), is recommended. Aglépristone blocks the progesterone receptors and thus impedes the adhesion of bacteria on the surface of the endometrium. At the same time Aglépristone causes the opening of the cervix. Aglépristone (Alizine®, Virbac) is injected in a dosage of

10 mg/kg KG s.c. 2 x 24 hours apart. One day after the second injection Prostaglandin (PG F<sub>2α</sub>) treatment is initiated at a dosage of 20-30 µg/kg BW PG F<sub>2α</sub> (Dinolytic®, Upjohn) tid i.m.. Additionally, a broad spectrum antibiotic or chemotherapeutic is given per os for 3 weeks. One week after the beginning of treatment a re-examination of the uterus by ultrasonography should be performed.

### Prognosis

The risk of reoccurrence is relatively high. This can be reduced by mating the bitch in the next oestrus cycle.

### References

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