

## THE MUCOMETRA- PYOMETRA COMPLEX IN THE QUEEN

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Mucometra (also called hydrometra): Mucometra is characterized by an accumulation of non inflammatory liquid inside the uterine lumen. This liquid is generally clear and viscid, similar to mucus. This accumulation is often such that the uterus is distended like in pyometra and may reach important size. Volumes of more than 500 ml have been observed in some animals. There are generally no or few clinical signs associated with the presence of mucometra, except in some cases of abdominal distension by the enlarged uterus and clinical signs dependent of the compression of the abdominal organs. Mucometra is most often observed in young animals, but may also be observed in older animals. In young animals, the origin of this trouble may be the consequence of congenital abnormalities, leading to impotency of the uterus. In older animals, it may be either the consequence of cystic endometrial hyperplasia (CEH), or also inflammatory process, neoplasia and/or trauma. The exact cause of this pathological process is generally difficult to define and can be observed in animals without evidence of CEH. Further in some animals, the endometrium and uterine walls are atrophic and often not thicker than a paper sheet. It has been suggested that this is due also to prolonged progestin treatment ; however, the author has often observed this condition in young animals (2 to 3 years old), without any evidence of previous progestin treatment. Endogenous progesterone associated with spontaneous ovulation may be responsible for the occurrence of this often asymptomatic disease. However, this has not yet been demonstrated. Although possible, a relation between the occurrence of mucometra and pyometra is not directly observable. The treatment of mucometra is still the subject of many debates ; however, the authors have treated some mucometra in highly valuable queens with a similar treatment as for the pyometra and with good results. In animals not dedicated to the reproduction, the best and easiest treatment is probably ovariohysterectomy.

The cystic endometrial hyperplasia-pyometra complex. This complex is less often observed in cats than in dogs. However, its frequency might be under-estimated as many cats do not clinically express the pathology. In cats, the described incidence seems to be around 0.6%, but some authors described in old animals and in colonies an incidence as high as 66%! The incidence is, as in dogs, increasing with age, with a mean age at detection of 7.6 years. Clinical signs are few in cats and, in general, no significant hematological (but neutrophilia) and biochemical changes are observed. Renal lesions are less often observed than in dogs. The etiology is less clear in cats than in dogs and, even if the relation with progesterone is generally proposed, this hypothesis is less easily demonstrated in feline. Indeed, queens being induced ovulators, high and prolonged plasma progesterone concentrations are only observed when ovulation occurs and not at every cycle as in bitches. The recent description of a high incidence of pseudopregnancy in cats might be an explanation corroborating the possible role of the repeated and prolonged progesterone impregnation. In a study, it was observed that only 23% of

cats without pyometra or endometritis had corpora lutea (CL) in at least one ovary, whereas 40% (16/40) of cats with either pyometra or endometritis had CL. The authors concluded that the prevalence of CEH in cats increases with age in sexually intact female cats, and that most cases of pyometra or endometritis, but not CEH, are, in cats, associated with retained CL.

However, the observation made in dogs that uterine reactivity to local stimuli (mechanical or biological) might be the first and real inductor of cystic endometrial hyperplasia has also certainly to be taken into account in the feline species. Indeed, the pyometra is generally observed around one month after the estrous period during which the cervix is open. It is thus easy to imagine that during this period of open cervix, either bacteria or foreign bodies related to mating can enter the uterus and induce the development of the pathological process. However, further investigation is certainly warranted before the exact etiopathogenesis of the CEH-pyometra complex can be clearly understood. Hyperplastic development of the uterine tissues, whatever the origin, certainly leads or facilitates bacterial growth and pyometra. The most commonly observed bacteria is *E. Coli*, but the other classical bacteria from the vagino-rectal flora of the cats can also be observed (*Streptococcus* sp., *Staphylococcus* sp., *Pasteurella* sp., *Klebsiella* sp., *Moraxella* sp. and *Pseudomonas* sp.

The pyometra is most often observed (78% of cases) around one month after estrus, which corroborates the possible role of either cervix opening or spontaneous ovulation in the pathogeny of the process. When observed, the clinical signs are : vaginal discharges in around 70% of the animals, anorexia (40%), abdominal distension (40%), dehydration (33%), lethargy (32%), hyperthermia (20%), emesis (16%). Opposite to the dog, where polyuria-polydipsia is a commonly observed symptom, this clinical sign is rarely described in queens (9%). The uterus can sometimes be palpated (39%) and leucocytosis seems to be a relatively common pathological finding (66%). The pyometra can be diffuse or segmental.

Diabetes mellitus has been described to be a favorizing factor for the development of pyometra, either by the modification of the uterine secretion or by the metabolic changes observed in these animals, facilitating all kind of infectious problems.

Prostaglandins „such as Dinoprost, may be used to induce direct stimulation of the uterine smooth muscle and to cause luteolysis in order to treat cases of pyometra. The mechanism of action is to induce a functional arrest and a luteolysis of the corpora lutea, promote the opening of the cervix and induce uterine contractions. Highest dosages of P<sub>g</sub>F<sub>2</sub>alpha are no longer recommended in cats nor in dogs, even if the side effects are less frequent, less important and of shorter duration than in dogs ; their importance in some already debilitated animals is certainly questionable. The authors nowadays use, in both dogs and cats, repeated administrations of low doses. Doses of 20 to 50 µg/kg administered 3 to 5 times a day have the preference in comparison with 200 to 500 µg/kg once or twice a day for 5 to 7 days, associated with the appropriate antibiotic and fluid therapies. The P<sub>g</sub>F<sub>2</sub> alpha was administered (0.01 to 0.05 mg/kg of body weight, SC, every 4 to 6 hours) for 5 to 10 days. Contrary to the well described post-injection reactions caused by high doses of P<sub>g</sub>F<sub>2</sub> alpha (vocalization, panting, restlessness, grooming, tenesmus, salivation, diarrhea, kneading, mydriasis, emesis, urination, and lordosis), that treatment is generally well tolerated with, as a main reaction, and in some animals only, a transient salivation. Moreover, the final advantage of this treatment is that it allows the treatment of animals with closed cervix pyometra. The low dose does not induce brutal muscle contraction, and this allows for the cervix to open without risk of uterine rupture. All queens improved clinically after P<sub>g</sub>F<sub>2</sub>alpha treatment, which efficacy was controlled by sonography. In the

majority of the animals, the uterine size decreased by 50% in 72 to 96 hours. Treatment was stopped when no more lumen was detected in the uterus of treated animals. However, some animals responded poorly to the treatment and nowadays, when after 5 days, the 50% reduction of uterus size was not observed, the animals are committed to surgery. The successfully treated animals resumed normal estrous cycles without further treatment and, if mated, they generally deliver normal litter(s). The use of PGF2alpha is an acceptable treatment for both open and closed cervix pyometra in queens if low doses are used.

Furthermore, as pyometra is often observed in luteal phase animals, the authors nowadays used cabergoline as an anti-prolactinic agent to induce luteolysis. Indeed, on one hand, progesterone facilitates the pyometra development, but, on the other hand, is also responsible for the cervical closure and associated with some immunity depressant properties, which are not positive for the recovery of the animals. During early luteal phase, prostaglandins, particularly if used at low doses, have reduced or poor abilities to induce complete and definite luteolysis. Anti-prolactinic agents have clearly been demonstrated to be highly efficient to induce luteal arrest and luteolysis as soon as days 15-20 post mating. Being devoid of any significant side effects, their use facilitates luteolysis, improves immunity and facilitates the action of the PgF2alpha on the uterus. Fertility appears to be conserved after resolution of the condition. However, if reproduction is not needed, ovariohysterectomy is the preferred option. No significant data are available concerning the use of progesterone antagonists such as RU486 or RU46534 in cats.