Case Report

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A Case of Pyometra In A 5-Month-Old Cat

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ABSTRACT

Pyometra is an inflammation of the uterus which is characterized by purulent to sanguinopurulent intraluminal contents. Pyometra has been mostly observed in queens older than 6 years but it has no age predilection. The average age of cats with pyometra is between 5 - 7 years. Traditionally queens reach puberty at a bodyweight of 2.3-2.5 kg. Here in this case we have a 5-month-old cat which has not experienced oestrus but yet developed a pyometra. In this case ovariohysterectomy was performed on this queen. The treatment procedure continued with fluid therapy and antibiotics.

Keywords: *Pyometra, Queen, E. coli, Kitten*

INTRODUCTION

Pyometra is a common disease of adult intact female dogs and cats and it is characterized by an acute or chronic suppurative bacterial infection of the uterus (Dow, 1959; Hagman and Greko, 2005). Ovarian hormones are considered the main factors in pyometra development and progesterone is assumed to be the primary factor of its pathogenesis (Maria dos Anjos Pires et al., 2016). But, the etiopathogenesis of pyometra is still not fully understood (Hagman, 2018). Progesterone plays an important role in the pathogenesis of infection for this reason the disease generally develops in the luteal phase or during pseudopregnancy which is a phase of progesterone dominance that lasts approximately 40 days (Hagman, 2018; Hollinshead and Krekeler, 2016). Opportunistic bacterias are responsible for the disease and E. coli is the most frequently isolated one from these pathogens (Hagman and Greko, 2005). Other bacterias are also included in the pathogenesis of queen pyometra, including Streptococcus, Staphylococcus, Klebsiella, Pasteurella, Pseudomonas, and Proteus species (Rebordão et al., 2017).

The incidence of pyometra is thought to be lower in cats than dogs, because queens are induced ovulators. Pyometra can occur in queens between the ages of 1-20, most commonly around 5-7 years old (Hollinshead and Krekeler, 2016).

Purulent, sanguinopurulent vaginal discharge was observed in 50-86% of open feline pyometra. Vaginal discharge is not observed in closed pyometra and lethargy, anorexia, polydipsia, polyuria and vomiting are among the reported symptoms. Abdominal ultrasound is considered the best tool for the diagnosis of pyometra (Hollinshead and Krekeler, 2016; Davidson and Black, 2015.)

Medical or surgical treatment can be applied depending on the condition of the patient in pyometra cases. Broad-spectrum antibiotic therapy should start immediately after diagnosis in all pyometra cases. Surgery can be performed once the patient has been stabilized and surgical risk is

minimized. The most common treatment of pyometra is the surgical method.

The presented report describes the clinical presentation of pyometra in an intact 5-month-old queen and results of bacterial culture and sensitivity testing.

CASE

A 5-month-old kitten, weighing 2.3 kg, was admitted to Small Animal Hospital, Faculty of Veterinary Medicine in Ankara with a history of purulent vaginal discharge for a few days. And also the only knowledge about the patient's history is the cat fell down from the height a few months ago and the veterinarian used oral antibiotics and the owner has been using multi-vitamin paste for the cat about a month for treatment.

A general examination was performed and usual/specific symptoms of pyometra have not been noticed. During the ultrasonographic examination the uterus was distended with fluid. According to the owner of the patient, the cat hasn't experienced oestrus or received estrogen or progesterone compounds. The diagnosis of the case was open-cervix pyometra.

Ovariohysterectomy is one of the treatment procedures of pyometra. At the owner's request, ovariohysterectomy was our choice instead of medical treatment. Before the surgery, we collected blood samples for biochemical tests and Complete Blood Count (CBC) and the animal was found to be stable for surgery (Table 1, Table 2). General anesthesia was induced with medetomidine (Medetomidin, Domitor®, Pfizer®, Finland) and maintained with ketamine (ketamine hydrochloride, Ketasol® 10%, Richter Pharma Ag, Austria). We positioned the patient in dorsal recumbency for a ventral midline celiotomy, clipped the entire ventral abdomen and prepared for aseptic surgery. Ovariohysterectomy operation was performed and both ovaries and both horns of the uterus were removed. During surgery intravenous antibiotic (Ampicillin + Sulbactam, Sulbaksit 500 mg Im/IV, Tüm Ekip İlaç A.Ş., Türkiye) treatment was applied. 45 minutes after the medetomidine injection, atipamezole hydrochloride (Atipamezole, Antisedan®, Pfizer®, Finland) was injected. After the surgery horns were dissected and purulent discharge was collected (Figure 1). Escherichia coli and Klebsiella spp. have been isolated with microbiological examination.

Table 1. Serum Biochemical Analysis

Parameters	Measured Value	Laboratory Reference Range
Urea (mg/dl)	47.5	42.80 – 64.20
Creatinin (mg/dl)	0.72	0.80 -1.80
Albumin (g/dL)	2.36	2.40 – 3.80
ALT (IU/L)	27.0	0.00 – 50.00
AST (IU/L)	16.0	0.00 – 40.00
CK (IU/L)	80.0	0.00 – 130.00

ALT: Alanine aminotransferase, AST: Aspartate aminotransferase, ALP: Alkaline phosphatase

Table 2. Hematological Analysis

Parameters	Measured Value	Laboratory Reference Range
WBC	12.50	5.50 – 19.50
LYM	3.60	1.10 – 7.00
MONO	1.00	0.20 – 1.50
NEUT	7.60	2.80 – 13.00
EOS	0.30	0.10 – 99.90
LYM%	28.90	15.00 – 60.00
MONO%	7.70	0.50 – 11.00
NEUT%	61.10	25.00 – 85.00
EOS%	2.30	0.10 – 99.90
RBC	7.77	5.00 – 11.00
HGB	11.50	8.00 – 15.00
HCT	25.60	25.00 – 45.00
MCV	32.90	39.00 – 50.00
MCH	14.80	12.50 – 17.50
MCHC	45.10	31.00 – 38.50
RDWa	17.40	20.00 – 35.00
RDW%	16.70	14.00 – 18.50
PLT	156.00	200.00 – 500.00
MPV	11.10	8.00 – 12.00

WBC: White blood cells, LYM: Lymphocytes, MONO: Monocytes, NEUT: Neutrophil, EOS: Eosinophils, LYM%: Lymphocytes percent, MONO%: Monocytes percent, NEUT%: Neutrophil percent, EOS%: Eosinophils percent, RBC: red blood cells, HGB: Haemoglobin, HCT: Haematocrit, MCV: Mean corpuscular volume, MCHC: Mean corpuscular hemoglobin concentration, RDWa: Red blood cell distribution, RDWa%: Red blood cell distribution percent, PLT: Platelet, MPV: Mean platelet volume

According to antibiogram test results bacterial isolates were found to be susceptible to sulfamethoxazole, ampicillin, enrofloxacin; semi-susceptible gentamicin and resistant to neomycin sulfate. The medical treatment continued with fluid therapy. Amoxicillin-clavulanic acid (Amoklavin; Suspension) 25 mg/kg BID was administered after surgery for five consecutive days until the cat's

health condition returned to normal. Post-operation controls were made on day 3 and 7 after the operation and at the end of 7th day, stitches were removed.

Figure 1. Uterine content after operation

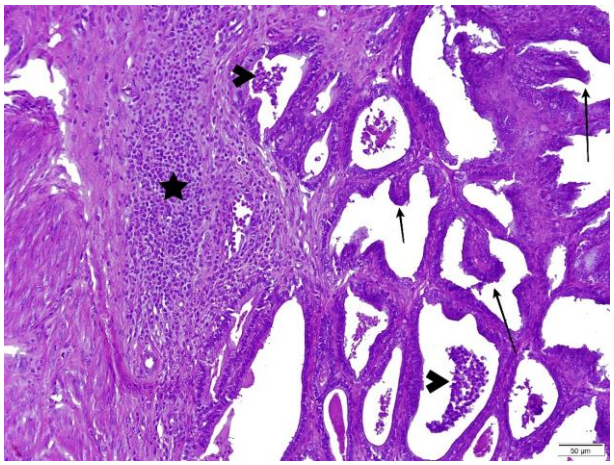

Figure 2. Living and dead neutrophil leukocytes (Arrowhead), mononuclear cell infiltrations (Stars) and Papillar extensions (Arrows) in gland lumens. HE staining.

After the surgery uterus and ovaries were put in 10% formaldehyde for histopathologic examination. After detection of the uterus tissue in 10% formaldehyde brought to the Ankara University Department of Pathology, it was trimmed and placed in the cassettes and subsequently washed for 12 hours in running water. Then, tissues were taken to the routine tissue tracer (Leica TP1020) and blocked in paraffin (Thermo Electron Corp. Shandon Histocentre 3). Sections prepared from each block with a microtome (Leica RM2255) of 5 µm thickness; after deparaffinization and dehydration steps in an automatic dyeing machine (Leica Autostainer XL), by Harris's Hematoxylin-Eosin (HE) method; It was closed with lamella in the automatic capping machine (Leica CV5030). All findings were evaluated under a light microscope (Olympus BX51) and their diagnoses were made and the necessary areas were photographed (Olympus DP71).

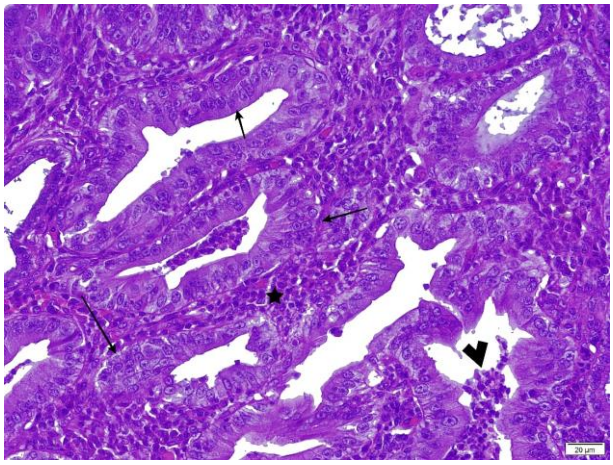

Figure 3. Epithelial hyperplasia (Arrows) in the uterine glands, mononuclear cell infiltration (Star) between the glands, and dead and living neutrophil leukocytes (Arrowhead) in the gland lumen. HE staining.

In histopathological examination, intensive dead and living neutrophil leukocyte accumulations were observed in the uterine lumen (Figure 2). The neutrophil leukocytes in question were also detected in the gland lumens from place to place with a slight severity (Figures 2 and 3). The glands in the endometrium were enlarged, their number had increased. Mononuclear cell infiltrations, both in the endometrium between the glands and in the myometrium, as multifocal areas, attracted attention (Figures 2 and 3). In the histopathological examination of ovaries, follicles were detected at various stages. According to this report, the diagnosis is metritis subacute.

DISCUSSION

Generally, pyometra occurs in queens between the age of 5-7 (average 7.6 years, range 1-20) but it can be observed any time after puberty (Ettinger & Feldman, 2010). Clinical signs usually occur within 4 weeks after the onset of oestrus in queens that are either mated, spontaneously ovulate or are induced to ovulate (mechanical stimulation or hormone induction) (Hagman, 2018). In this case the queen has never experienced oestrus or medically

stimulated with any other drugs or injection and the age of 5-month-old.

Pyometra is most common in dogs but more fatal in queens. Progesterone-mediated pathological proliferation and the formation of cystic endometrial hyperplasia are believed to predispose to pyometra, but two disorders can develop independently (Hagman, 2018). In this case no cystic endometrial hyperplasia was observed. One of the reasons for low mechanical stimulation (e.g excessive petting or vaginal palpation), thus no recurrent estrogen and progesterone effects on the uterus. Another reason is that the uterus is exposed to progesterone in queens (40-50 days) than in bitches (over 60 days) (Agudelo, 2005; Smith, 2014).

According to our knowledge pyometra occurs when the uterine environment during the luteal phase is suitable for pregnancy but also for microbial growth. Progesterone stimulates growth and proliferation of endometrial glands, increased secretion, cervical closure, and suppression of myometrial contractions. In this case the oestrus cycle hasn't occurred so that suppression of functions of uterus by progesterone cannot be the reason for bacterial infection. It may be caused by spontaneous ovulation which is a rare occasion in queens (Lawler et al., 1993). Despite many hypotheses, the reason behind the spontaneous ovulation might be because of the breed of the cat. Recent studies showed Oriental purebred cats having a higher incidence of pyometra than domestic and mixed-breed cats. It has also been observed by many authors that Oriental breed cats have a short interoestrus intervals compared to domestic cat breeds (Hollinshead and Krekeler, 2016).

In fact, progesterone measurement is useful, but this was not necessary because the patient did not show oestrus therefore we didn't include progesterone measurement for this study.

In many studies with microbiological examinations Escherichia coli, Klebsiella spp., Streptococcus spp. are commonly isolated. The main reason for this is that these are the opportunistic bacterial population on the urinary and intestinal tracts of cats (Hagman, 2018). In this case Escherichia coli, Klebsiella spp., were also isolated. Klebsiella spp. is a common bacterium in dogs and cats, one report documented the isolation of this pathogen from 2 dogs with diarrhea. Some strains of K. pneumoniae have been shown to produce an enterotoxin, similar to enterotoxic strains of Escherichia coli, which stimulate secretion of fluid by mediating activation of the guanylcyclase–cyclic guanosine monophosphate mechanism (Olsen et al, 1985). According to this we have continued to administer Amoxicillin-clavulanic acid (Amoklavin; Suspension) 25 mg/kg BID for 5 days.

The postoperative complication includes peritonitis, dysfunction of the kidneys and liver, deterioration in health condition (Hagman, 2018). In our case we did not have any complications relating to peritonitis or any other health problems but we have continued with fluid therapy to prevent any kind of complications after the operation.

In conclusion pyometra has a complex pathology so it should not be disregarded when dealing with feline species or in animals of an age that is not typical for pyometra.

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