



CASE REPORT

Histopathological Observations on the Uterus and Ovary of a Cat with Pyometra

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ABSTRACT

An 8-year-old, crossbred domestic queen, weighing 2.9 kg, was examined because of obvious clinical signs, including anorexia, lethargy and vomiting, with small quantities of yellow vaginal mucopurulent discharge. Palpation revealed the presence of an abdominal mass. A diagnosis of pyometra was made by radiology. After undergoing ovario-hysterectomy, the queen made a full recovery. Histopathological examination of the uterus and ovary was made. A sterilization case was included for microscopic comparison. Results showed that endometrium of the cat with pyometra presented atrophy and shedding of superficial epithelium, and there were apparent cystic follicles in ovary.

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INTRODUCTION

Pyometra in cats is not common, 12 of three thousand (0.4%) adult free-roaming females were found having pyometra in a trap-neuter-return program (Scott *et al.*, 2002). It is a disease that is mainly characterized by progesterone-induced hyperplasia of the endometrium, cystic dilatation of the endometrial glands and inflammation of the uterus, with purulent contents in the uterine lumen leading to several clinical signs (Stanley and Pacchiana, 2008). Clinical signs depend on whether the cervix is open or not: If it is open, vaginal mucopurulent discharge can be a common finding. If not, there can be an abdominal distention. Both types can present symptoms such as fervescence, lethargy, anorexia, polyuria and sometimes vomiting. Feline pyometra can be caused by hormone-induced factors and secondary bacterial infections. The abnormal endometrium can be a predisposing factor to the bacterial infection, commonly *Escherichia coli*, ascending from the vagina (Agudelo, 2005). The present paper describes histological picture of the uterus and ovary in a cat with pyometra.

Case history and diagnosis: On March 23, 2012, a crossbred female domestic shorthair cat was taken to the Veterinary Hospital Attached to Nanjing Agricultural University because of deteriorated physical condition that had sustained for about 2 weeks. The cat was 8-year-old, weighing 2.9 kg, living indoors with no free access to the outdoors, had shown symptoms such as reduced appetite, vomiting, unkempt appearance, dysphoria, groan and

abdominal straining. General examination showed rectal temperature 38.6°C, a heart rate 136 beats per minute, and a breathe rate 60 per minute. Inspection showed an apparently abdominal straining. The uterus could be palpated as a particularly enlarged tubular fluid-filled mass. A presumptive diagnosis of pyometra was confirmed by a radiological examination, when, a rounded, well-demarcated, full-filled tissue mass was observed located in enterocoelia (Fig. 1).

Ovario-hysterectomy and histopathological findings:

After sedation, a regular ovario-hysterectomy was performed through mid-line approach. Anaesthesia was maintained with Telazol (tiletamine and zolazepam; Virbac). Laparotomy showed the presence of an observably enlarged pus-filled uterus and closed-cervix pyometra was diagnosed (Fig. 2). Associated vessels and ligaments were clipped by hemoclips and were ligated before sectioning. The uterus and ovaries were carefully isolated from the surrounding tissue and removed as completely as possible. The abdomen was closed routinely in a 3-layer closure. The skin, the linea alba and muscular layer, the subcutaneous connective tissues, were all closed with a simple interrupted pattern. After surgery, the patient recovered fully.

Following removal of the uterus, incision into the uterus revealed attenuate and non-cystic uterine wall, with a remarkable amount of purulent exudate in the lumen, which was viscous, foul-smelling and laurel-green in color. Histopathology of the excised tissues including a section of uterine wall measuring 0.5×0.5 cm and an



Fig. 1: Lateral radiology of the abdomen showing extremely enlarged uterus.



Fig. 2: Pyometra was confirmed when an enlarged fluid-filled uterus appeared during surgery

ovarian tissue was performed through hematoxylin and eosin staining, using standard procedures. A sterilization case was included for histological comparison.

Histopathological examination of the section of uterine wall showed uterine wall turning attenuate. There was atrophy of both endometrium and endometrial glands (Fig. 3). Shedding of superficial epithelium of endometrium was severe. In contrast, the columnar cells of superficial epithelium of normal uterus were intact (Fig. 4). Presence of hemorrhagic areas was also found in endometrium. Although no severe inflammation could be observed in histopathological examination, some areas were found infiltrated by lymphocytes and neutrophils, indicating regional inflammation. These findings suggest the existence of purulent inflammation.

Meanwhile, histopathological examination of the ovary revealed three cystic follicles, the most marked histopathological observation. Blood cells were found in some ovarian rifts which were caused by overgrown cystic follicles (Fig. 5). Normal follicles and a small corpus luteum were also observed besides cystic follicles.

DISCUSSION

Influenced by age, pyometra has been observed in queens older than 8 years and in younger queens after progesterone administration (even if they have been

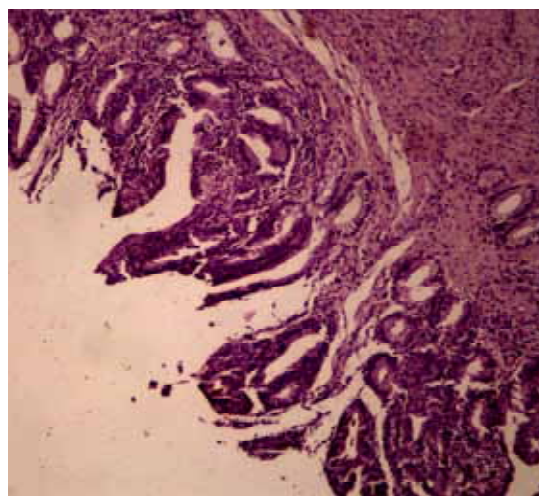


Fig. 3: Microscopic structure of endometrium of the queen with pyometra; shedding of epithelium and endometrial atrophy are obvious. (H & E; $\times 10$)

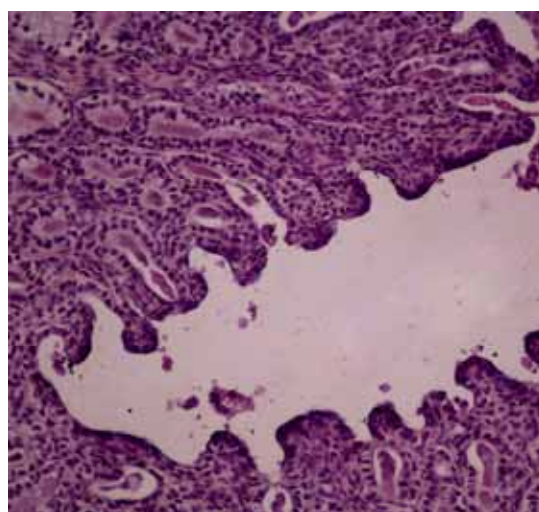


Fig. 4: Microscopic structure of endometrium of the normal queen showing intact epithelium and glands (H & E; $\times 20$)

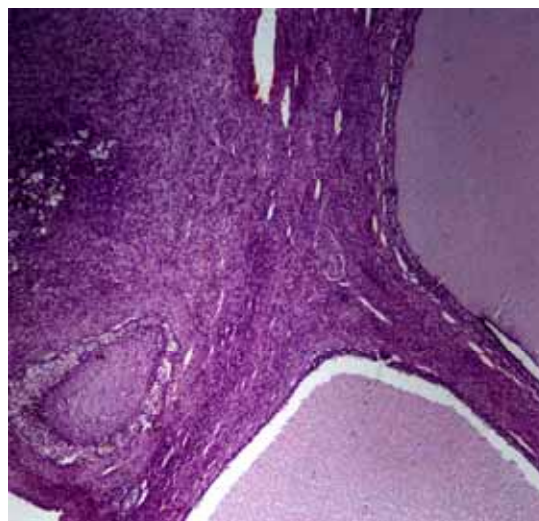


Fig. 5: Microscopic structure of ovarian tissues collected from the queen with pyometra. Cystic follicles and ovarian rifts are presented (H & E; $\times 4$)

ovariectomized) and is more likely to occur in elderly nulliparous queens (Agudelo, 2005). In this case, the queen was 8-years-old and nulliparous. The disease can be treated successfully both surgically and medically, but medical therapy should be avoided if the pyometra is closed (de Faria and Norsworthy, 2008). However, the ideal approach is still the surgical therapy, during which the uterus and ovary should be removed as completely as possible because pyometra or stump pyometra have been reported in neutered cases (de Faria and Norsworthy, 2008; Rota *et al.*, 2011).

Pyometra frequently occurs in luteal phase, correlation between pyometra and corpus luteum presence has been observed, as in about 40-70% of the cases corpora lutea were present (Agudelo, 2005). In this feline pyometra case, a corpus luteum was also found. But pyometra has also been found in queens in follicular phase, which is influenced by estrogen besides progesterone (von Reitzeinstein *et al.*, 2000). Cats with pyometra may also have low serum progesterone concentrations because the effects of progesterone on uterine mucosa and glands may persist beyond the end of the luteal phase (Rota *et al.*, 2011).

On the other hand, correlation and interaction between pyometra and ovarian abnormality remains to be determined. High estrogen level induced by ovarian cyst should be suspected as a cause of pyometra. In dogs with pyometra, cystic corpus luteum and cystic follicles were common findings (Qian and Hou, 2005). In queens with pyometra, 15 to 23% cases were found with cystic follicles and not in luteal phase (Agudelo, 2005).

Common abnormalities of the uterus induced by pyometra are cystic endometrial hyperplasia (CEH) and endometrial inflammation. In CEH, especially in open-cervix cases, thickness of endometrium can be observed due to hyperplasia of the endometrium and expansion of endometrial glands. Research shows that CEH can be found in all feline pyometra cases except for some closed-cervix cases with atrophy of the uterine wall (Agudelo, 2005), which is consistent with our observation.

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