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Management of closed cervix pyometra in a Spitz dog: A case report

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Abstract
Pyometra is a life threatening disease and classified as open cervix pyometra and closed cervix pyometra depend on the patency of cervix. In open cervix pyometra vaginal discharge is often present and it is absent in closed cervix pyometra. Closed cervix pyometra is more serious condition due to the accumulation of pus and bacterial endotoxins with in the uterus that results in sepsis. A 6 year old female Spitz was presented to Palakkad Pet Hospital with a history of vomiting and abdominal enlargement. On physical examination, enlarged uterus could be palpated. Haematological and serological examination revealed leokocytosis with neutrophilia and elevated level of creatinine. By ultrasonography and along with the history and clinical findings the disease was diagnosed as closed cervix pyometra. Surgical Ovariohysterectomy (OHE) was performed to manage the closed cervix pyometra as it also prevent the recurrence of the disease.

Keywords: Closed cervix pyometra, progesterone, ultrasonography, ovariohysterectomy (OHE)

Introduction
Pyometra is the accumulation of pus in the uterine lumen and a potential life threatening pathological condition most commonly seen in the middle aged diestrual bitches [1]. The disease is hormone mediated and mainly progesterone plays a significant role in the establishment of infection with ascending opportunistic pathogens generally during the luteal phase [2]. The most common pathogen isolated from uterus infected with pyometra is *Escherechia coli* [3]. The risk factors associated with canine pyometra are age, breed, and exogenous administration of steroid hormones such as progesterone and estrogen and also cystic endometrial hyperplasia (CEH). The incidence of the disease is more in middle aged to old age dogs and the risk increases in the dogs which are not spayed [4]. A higher incidence in some dog breeds indicates that they may have a genetic predisposition. The incidence is more common in Labrador, Spitz, German shepherd and Dalmatian according the study conducted in Indian conditions [5] even though some variations observed in different studies. Progesterone stimulates the growth and proliferation of endometrial glands, increases secretions and suppresses the myometrial contractions which favour the bacterial growth and attachment to endometrium [6]. Estrogen indirectly acts as a risk factor to the disease as it enhances the response of progesterone to endometrium and also it relaxes the cervix for longer period. Cystic endometrial hyperplasia (CEH) generally predisposes to pyometra but in certain conditions bacterial growth may not be present and result in mucometra or hydrometra but these conditions are sterile [8].
The pyometra in bitches is categorized to open cervix pyometra and closed cervix pyometra depends on the patency of the cervix. In open cervix pyometra, there may be vaginal drainage of pus and less chance of systemic infection compared to closed cervix pyometra in which absorption of toxins from accumulated pus results in toxaemia [9]. Pyometra is a life threatening disease due to the endotoxemia and disseminated infection which leads to various organ dysfunctions [10]. About 60% of bitches with pyometra suffer from sepsis [11]. Ovariohysterectomy (OHE) is the safest and most effective treatment as it eliminates the source of infection and possibility of recurrence. The present case study describes the management of closed cervix pyometra in a bitch.

History and Clinical examination
A 6 year old female Spitz dog weighing 13.6 Kg was presented to a private veterinary clinic, Palakkad with a history of vomiting, polydipsia and enlarged abdomen.

As per the history, the bitch was not used for breeding in her entire reproductive period and the last estrus was observed 4 months before. The animal was depressed, on abdominal palpation animal exhibited pain and enlarged uterus could be palpated. Haematological examination revealed leukocytosis with neutrophilia and on serum biochemistry the level of creatinine was high (Table 1). Ultrasound scanning findings were enlarged uterus and convoluted uterine horns filled with anechoic fluid with echogenic particles within the fluid (Fig.1). The disease was diagnosed as pyometra from the history, physical and clinical examinations along with the ultrasound scanning findings. Hence the Ovariohysterctomy was fixed to surgically manage the disease and to prevent the recurrence.

Treatment

The animal was pre-anaesthetized with Inj. Atropine sulphate at 0.04mg/Kg body weight subcutaneously. After 10 minutes general anaesthesia was induced by administering Xylazine at 0.5mg/Kg body weight and Ketamine hydrochloride at 10mg/Kg body weight intramuscularly. The bitch was anaesthetised after 15 minutes and transferred to operation theatre. All aseptic measures for the surgery were taken. Anaesthesia was maintained by administering 1:1 combination of Diazepam and Ketamine hydrochloride intravenously at a dose rate of 0.2 mg/Kg body weight and 5 mg/Kg body weight. Normal saline was infused intravenously during the entire process of surgery and administered Tramadol at a dose rate of 2mg/Kg body weight to reduce the pain during the surgical procedure. By mid-ventral incision the abdomen was exposed, using synthetic absorbable suture material, Polyglactin 910, 1-0 ligated the uterine and ovarian blood vessels and removed both the uterus and ovaries completely (Fig 2.). The muscle layer and the subcutaneous incision were closed with Polyglactin 910, 1-0 by simple continuous sutures and skin incision closed with nylon as suture material by simple interrupted sutures. On gross examination, the removed uterus was large in size and uterine horns were filled with sanguineous purulent fluid (Fig.3). As a post operative care, the bitch was given an antibiotic, Amoxycillin intravenously at a dose rate of 15 mg/Kg body weight at 12 Hr interval for 7 days and pantoprazole intravenously at a dose rate of 1mg/Kg body weight. Dressing of the wound was done with antiseptic cream up to the healing of wound. After 14 days the suture was removed and the animal was completely recovered.

Discussion

Generally, middle aged to older bitches are presented after estrus observed 2 to 4 months with a history of systemic illness or various signs of genital. Tract [12] as in the present case study. The symptoms such as vomiting is common in severely infected animals [13]. The vaginal discharge of haemorrhagic or mucopurulent consistency is often present in open cervix pyometra but it can be absent in closed cervix pyometra [8]. In this case vaginal discharge was not observed as it was closed cervix pyometra. The other clinical signs associated with pyometra are abdominal pain, pyrexia, hyperaemic mucous membrane and sternal recumbence. The diagnosis of closed cervix pyometra is little challenging due to the absence of vaginal discharge [12]. The preliminary diagnosis is based on history, clinical examinations and from the laboratory findings. The most common finding in haematological examination of bitches with closed cervix pyometra is leukocytosis with shift to left [14] as in the present case report. Renal dysfunction is common in the disease and the level of BUN and creatinine may be high due to endotoxemia induced glomerular dysfunction and renal tubular damage [15]. In the present case, observed the lekocytosis and elevated creatinine level on haematological and serological examination.

Ultrasound scanning found to be more efficient than radiography in positive cases with 100% efficacy [16]. The typical findings in ultrasound scanning is enlarged uterus and convoluted tubular horns filled with anechoic to hypoechoic fluid [17]. Ovariohysterctomy is the safest and most effective treatment especially for closed cervix pyometra as it completely removes the pathogen and reduces the chance of recurrence [12]. In open cervix pyometra, medical management can be practiced in young and breeding bitches. In the present case, surgical management was indicated as there was a huge amount of pus accumulated in the uterus. Ovariohysterctomy was done to treat the closed cervix pyometra to prevent the recurrence.

Table 1: Clinical and Labaratory findings.

Parameters	Values: Present case-Pyometra	Reference value
WBC	73.4×10 ^{9}/L	6-17×10 ^{9}/L
Lymphocyte	9.5%	12-33%
MID%	1.8%	2-13%
Granulocyte	88.7%	52-81%
RBC	5.43×10 ^{12}/L	5.1-8×10^{12}/L
Creatinine	1.47 mg/dl	0.5-1 mg/dl

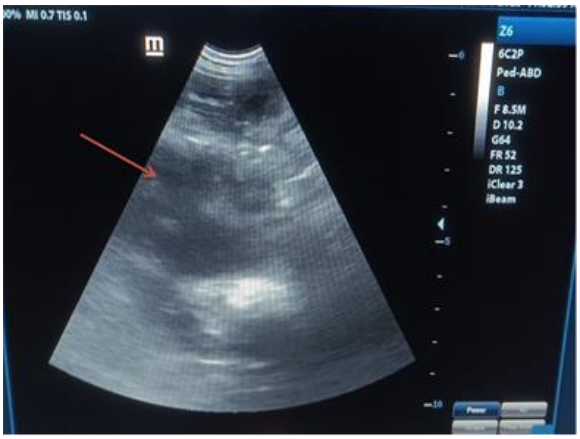

Fig 1: Ulrasonography of uterus reveals anaechoic fluid with echogenic particles.

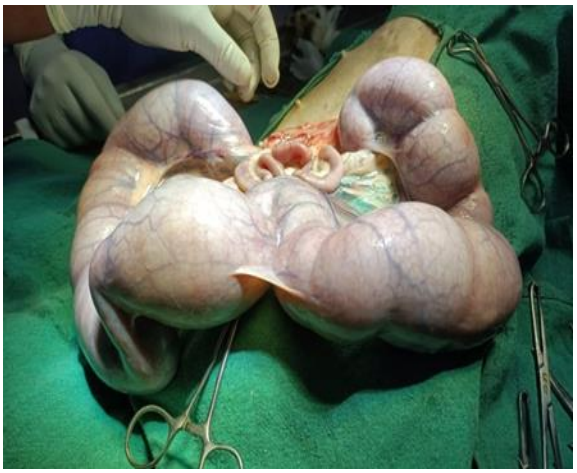

Fig 2: Enlarged uterus with pus on mid ventral incision of abdomen

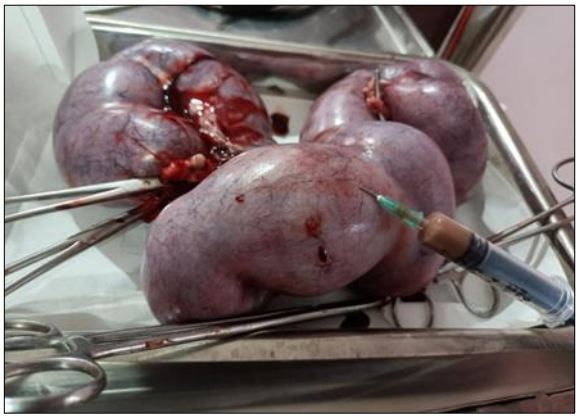

Fig 3: Enlarged uterus with sanguineous pus aspirated in a syringe

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