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Panhysterectomy: A surgical intervention for cystic endometrial hyperplasia-pyometra complex in Great Dane

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Abstract

A female Great Dane was presented to Veterinary Clinical Complex (VCC) showing symptoms of mucopurulent white vaginal discharge. Cystic endometrial hyperplasia (CEH) with open cervix pyometra was diagnosed based on history, clinical examination, complete blood count, biochemical test and ultrasonography. Initially, the animal was treated with ceftriaxone @ 15 mg/kg body weight (BW) and supportive fluid therapy for the next 5 days, there was no improvement in the clinical condition of the bitch. Pan hysterectomy was performed under dissociative anaesthesia.

Keywords: Great Dane, USG, pyometra, pan-hysterectomy

Introduction

Cystic endometrial hyperplasia pyometra (CEHP) syndrome is a major and frequent diestrual problem in bitches. CEHP is associated with hypertrophy of endometrium followed by accumulation of pus inside the uterine lumen. Prevalence of CEHP has a positive correlation with the age of bitch, in a normal population of breeding bitches from 4-10 years of age are found more prone to CEHP [1]. In an experimental study it was found that every 5th breeding bitches belonging to the age group of 2.5-7.3 years of age generally suffers from CEH [2]. Cystic endometrial hyperplasia (CEH) is an abnormality associated with the growth and repair of the uterine endometrial glandular epithelial layer and in this condition, there is a significant increase in the number and size of the endometrial gland [3]. Pathogenesis of CEH is associated with cystic proliferation of the endometrial wall under influence of progesterone and oestrogen during the diestrual phase [4].

The progesterone (P₄) hormone is the predominant hormone during the diestrus phase of the oestrous cycle. Progesterone stimulates endometrial growth and its secretion (uterine milk) but it reduces myometrial contractibility which predisposes the attachment and proliferation of opportunistic bacteria to the endometrial epithelial cells of the uterus [5]. Exogenous administration of progesterone pills is often associated with CEH. Increased level of progesterone during the reproductive cycle causes immunosuppression due to a reduction in the differentiation of antigen-presenting dendritic cells [6]. Uterine secretion favours the growth of many opportunistic pathogens like *E. coli*, Staphylococci and Streptococci. Among them *E. coli* is the most commonly encountered pathogen [7].

E. coli produces endotoxin that induces an innate immune response and causes an increase in neutrophil production [8]. Circulating endotoxin in blood induces a systemic inflammatory response (SIRS) and causes damage to the glomerulus cells, which leads to a reduction in the efficacy of the kidney to filter nitrogenous substances and ultimately elevates the level of blood urea nitrogen (BUN), creatinine [9]. In this case report, blood profile, biochemical parameter and ultrasonographic finding of the endometrium are collectively taken as a key tool for diagnosis of CEHP.

Materials and Methods

History: A 4-year-old female Great Dane with a body weight of 51 kg was presented with a history of vaginal discharge, slight inappetence, polydipsia since 7 days and no history of parity.

Clinical examination: A clinical examination of the female dog was performed. There was slight dehydration and congestion of the ocular mucous membrane.

The body temperature of the animal was 101°F. The per vaginal examination by inserting the index finger revealed the presence of purulent foul-smelling discharge.

Diagnosis: Blood profile revealed an increase in WBC (31.6 million per mm³) and granulocyte (29.11 million per mm³) of blood, blood haemoglobin level and RBC in blood was found normal (15.4 gm/dl and 7.96 million per mm³ respectively), which is suggestive of sub-acute infection. Biochemical parameter such as ALT and AST were found to be normal and there was marked elevation of Blood Urea Nitrogen (BUN) and Creatinine (Table 1).

Ultrasonography was performed using a 3.5 MHz frequency transducer (Fig 1). It was found that the bladder was slightly distended with anechoic fluid, thickness and echo texture of the wall were found normal. Uterine sonographic findings include irregular margins of the endometrium with hypochoic multiple distended glandular cysts, and thickening of uterine wall with slightly echoic fluid-filled uterine horn, which is a diagnostic characteristic of cystic endometrial hyperplasia.

Treatment: Initially, the animal was treated with ceftriaxone @ 15 mg/kg BW intramuscularly twice a day for 5 days and with Chymoral Forte tablet 10 mg orally once a day for 5 days but satisfactory improvement was not found in the clinical condition of the patient and therefore ovariohysterectomy was performed.

Methodology: The owner was suggested to starve the animal 6-8 hours before the surgery. The animal was presented on 27/01/2023 for surgery during morning hours in the patient preparation room. A complete clinical examination (Heart rate, pulse rate, blood pressure, rectal temperature, mucus membrane) was performed before allowing the anaesthetic protocol. Shaving of the incision site was done using a standard protocol.

a) Anaesthetic protocol: Injection of Atropine Sulphate 3.4 ml (@ 0.004 mg/kg BW) subcutaneously was administered and after 10 minutes of Atropine Sulphate administration animal was placed on a surgical table. An intravenous IV catheter was placed in a cephalic vein and an intravenous line started with normal saline. Diazepam 5.1 ml (@ 0.5 mg/kg BW) intravenously along with the injection of ketamine 5.1 ml (@ 5 mg/kg BW) intravenously was administered after 10 minutes of Atropine Sulphate administration. Ceftriaxone 1 gm (@ 20 mg/kg BW), Texableed injection 3.5 ml, and pantoprazole 5 ml (@ 1 mg/kg BW) were administered intravenously. After this, the animal was sedated for the surgery. During the course of surgery, anaesthesia was maintained by using ketamine and diazepam as per requirement.

b) Surgical technique: The surgical site was swabbed with Povidone-iodine solution using a standard protocol. A 2-3 cm incision caudal to umbilicus of about 3-4 cm was made through the skin and subcutaneous tissue. Linea alba was grasped and tent it outward, and a stab incision was made into the abdominal cavity. Linea alba incision was extended cranial and caudal with help of mayo scissor. The middle finger was inserted into the abdomen against the ventral abdominal wall and the uterine horn was exposed outside the

abdomen, also suspensory ligament of the ovary was breached near the kidney with help of the index finger (Fig 2). Two Mosquito artery forceps were placed cranial to the ovary for ligation and another artery forceps was placed caudal to the ovary to prevent backflow of blood after transection. Miller's knot was placed (by using Vicryl-0) proximal to the clamp, cranial to the ovary and a cut was made between the proximal clamp, the same procedure was applied to the second ovary. The broad ligament was separated from the uterine horn. Ligation of the uterus by artery forceps was performed by placing miller's knot through the uterine body near the cervix. Again, the second ligation was placed close to the cervix and transected between the forceps and ligature. The last step was the closure of the abdominal wall. The abdominal muscle layer and peritoneum were sutured in a continuous suture pattern, and then subcutaneous tissue and muscle were also sutured in a continuous manner with help of vicryl suture (1-0), at the last step skin was sutured with a cross mattress by using nonabsorbable (nylon) suture material. After completion of the surgery, a dressing of the incision line was performed (Fig 3).

The post-operative protocol includes Cefpet-XL 200 mg tablet per os twice in a day for 5 days, Chymoral forte-10 mg tablet once a day for 10 days, and Verol Syrup 10 ml orally once a day for 20 days. On 12 days of post-surgery suture was removed and the dog was found to be normal in activity.

Table 1: Blood Routine examination and Biochemical examination

Blood Parameter	Estimated value (million/mm ³)	Normal range
WBC	31.63	6-17
Lym.	2.08	0.6-5.1
Mon.	0.44	0.1-1.7
Gra.	29.11	3-13.6
RBC	7.96	5.5-8.5
Serum Parameter	Estimated value	Normal range
Creatinine	1.9 mg/dl	0.5-1.8
BUN	32 mg/dl	7-27
ALT	26 U/L	10-125
AST	34 U/L	0-50

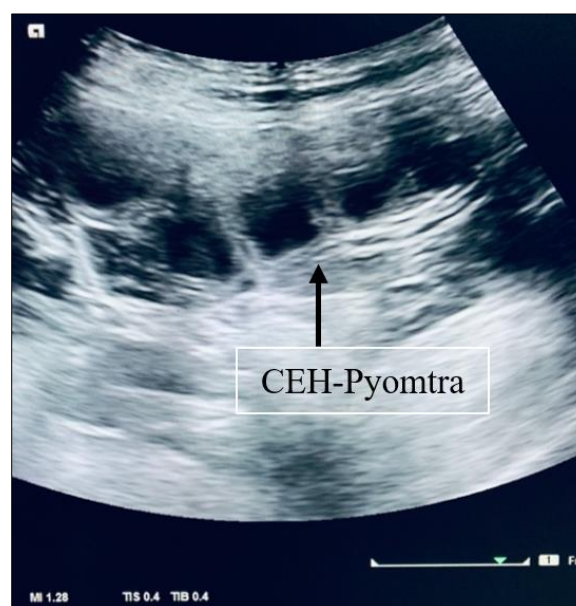


Fig 1: Ultrasonogram of CEH-Pyometra complex. Figure showed endometrial proliferation along with formation of anechoic pockets in abdomen (approx. 4 cm diameter uterine lumen)



Fig 2: Enlarged and distended uterine horn



Fig 3: Anaesthetic recovery phase of animal after surgery

Discussion

Pyometra is one of the commonest disease considered in dog. The closed pyometra is considered as more detrimental than open pyometra in bitches. Pyometra is also considered as inflammatory condition which causes marked suppression of the immune system due to suppressed lymphocyte activity^[10]. The present study encountered with many biochemical and haematological changes. The most commonly encountered blood parameters in dogs with pyometra are leukocytosis, neutrophilia, azotaemia and hyperproteinaemia. Similar finding was also reported by Kim and his coworkers^[10]. As shown in this case, increased BUN with creatinine along with increase WBC count in reproductive problem of bitch is highly correlated with CEH-pyometra complex.

Conclusion

Cystic endometrial hyperplasia with pyometra complex is the most common condition in old bitches of age more than 6 years of age. The use of contraceptive pills to prevent the reproductive cycle is a major cause of CEH. Therapeutic management of CEH has limited success. If the owner is not willing to perform breeding in the bitch, then the better option is to follow ovariohysterectomy, which is the most commonly used surgical intervention to overcome uterine diseases and pathological abnormality associated with the non-gravid uterus.

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