



## Cystic endometrial hyperplasia-pyometra complex complicated with both ehrlichiosis and hepatozoonosis in a Rottweiler bitch

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### Abstract

Cystic endometrial hyperplasia-pyometra syndrome is a very common uterine disorder reported in breeding bitches. This case report describes cystic endometrial hyperplasia-pyometra complex complicated with both ehrlichiosis and hepatozoonosis in a 21 kg, 3-year, 9-month-old intact Rottweiler bitch presented to the Veterinary Teaching Hospital, University of Ibadan with complaints of inappetence, vomiting, melena and swelling of the caudal abdomen around the pelvic entry which on aspiration was bloody. The bitch was said to have been mated by natural mating about 73 days prior to presentation at the clinic but showed no obvious sign of pregnancy. Ultrasonography revealed thickening of the endometrial wall with distended and anechoic sacs filled with heterogenous echogenicity which was later found to be due to pus accumulation in the uterus.

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### Introduction

The reproductive cycle in bitches is made up of 4 phases namely proestrus, oestrus, diestrus and anoestrus. The influence of the progesterone hormone in successive oestrus cycles in bitches especially during the diestrus phase can lead to excessive and persistent thickening of the uterine lining with cysts forming from glands within the uterine wall. An abnormal uterine condition called Cystic Endometrial Hyperplasia (CEH) is often associated with pyometra when there is an accumulation of purulent material due to the activity

of pyogenic bacteria within the uterine lumen (Camozzi *et al.*, 2023). Various bacteria have been incriminated in the CEH-pyometra complex. Some of them include *Escherichia coli*, *Staphylococcus aureus*, *Streptococcus canis*, *Enterobacter cloacae*, *Pasteurella multocida*, *Pseudomonas aeruginosa*, *Proteus* spp, *Klebsiella* spp and *Moraxella* spp (Agudelo, 2005). It is often observed in breeding bitches of 3 to 7 years of age and is commonly associated with uterine problems and conception rate abnormalities (Camozzi *et al.*, 2023).

Clinical signs shown by bitches with CEH-pyometra complex are mostly non-specific since other systemic diseases show the same signs. Commonly seen symptoms include pyrexia, inappetence, vomiting, diarrhoea, dehydration, polyuria, polydipsia, enlarged abdomen which might be sometimes painful to touch and discharge of pus from the vulva (in cases of open pyometra) (Porowska *et al.*, 2018). Diagnosis is often made based on history (especially of recent mating in an intact bitch), clinical signs observed on clinical examination (pyrexia, pale mucus membranes, purulent vulvar discharge and abdominal pain), laboratory tests, cervical smear for microbial culture and diagnostic imaging. To specifically diagnose CEH-pyometra complex, abdominal ultrasounds and x-rays have proven to be very helpful and have thus been mostly used (Bigliardi *et al.*, 2004). The medical management of CEH-pyometra involves the administration of multiple shots of prostaglandin as a stand-alone treatment or in combination with a prolactin inhibitor such as cabergoline (Haji *et al.*, 2017). Endometritis occurring after mating in breeding bitches due to CEH-pyometra reduces the ability of spermatozoa to attach to the uterine epithelium thereby leading to lower conception rates and litter size; all these therefore adversely affect the fertility potential of breeding bitches (Camozzi *et al.*, 2023).

**Case Presentation**

*Case history and clinical manifestation*

A 21 kg, 3 years, 9-month-old intact Rottweiler bitch was presented to the Veterinary Teaching Hospital, University of Ibadan with complaints of inappetence,

vomiting, melena and swelling of the caudal abdomen around the pelvic entry which on aspiration was bloody. Bitch was said to have been mated by a stud about 73 days prior to the presentation. She was housed in an outdoor kennel and fed a variety of dog feeds.

On physical examination, the dog had pale mucous membranes, was dehydrated and had a rectal temperature of 39.1 °C.

*Investigations*

Complete blood cell count, serum biochemical panel, abdominocentesis and abdominal ultrasonography were performed. A vaginal swab sample was also collected for microbial culture and antibiotics sensitivity test.

*Treatment*

The bitch was treated with 5% oxytetracycline (0.2 ml/kg body weight, intravenously, q24h) for 5 days followed by Doxycycline capsules (10 mg/kg body weight, PO, q24h) for 3 weeks, misoprostol (5 µg/kg body weight, PO, q8h) for 10 days. In addition, amoxicillin + clavulanic acid (10 mg/kg body weight, PO, q12h) for 10 days, 10 % dextrose (250 ml, intravenously), dexamethasone (0.5 mg/kg body weight, intramuscularly), metoclopramide (0.2 mg/kg body weight, intramuscularly) and vitamin B-complex (2 ml, intravenously) were administered.

The bitch showed initial improvement before a relapse which led to its death about a month after treatment.

**Results and Discussion**

Both Hepatozoon and Ehrlichia haemoparasites were observed in the blood smear. Complete blood count results (Table 1) revealed moderate non-regenerative anaemia, thrombocytopaenia and the leukogram showed mild leukopaenia due to a marked lymphopaenia. This could be a result of an ongoing chronic inflammatory disorder due to canine ehrlichiosis and hepatozoonosis. Snowden *et al.* (2022) reported similar laboratory findings of leukopaenia and thrombocytopaenia in ehrlichiosis. According to Baruti *et al.* (2023), the most commonly encountered blood parameters in dogs with pyometra are leukocytosis, neutrophilia,

**Table 1:** Haematological parameters of Rottweiler bitch with CEH-Pyometra complex complicated with ehrlichiosis and hepatozoonosis

Haematological parameter	Value	Reference interval	Remark
Haemoglobin (g/dl)	7.5	11.9-18.9	Low
PCV (%)	24	35-57	Low
RBC (x10 <sup>6</sup> /µl)	3.68	4.95-7.87	Low
Platelets (x10 <sup>3</sup> /µl)	105	211-621	Low
Total WBC (x10 <sup>3</sup> /µl)	4.1	5.0-14.1	Low
Segmented neutrophils (x10 <sup>3</sup> /µl) (%)	3.4 (82)	2.9-12 (58-85)	
Band neutrophils (x10 <sup>3</sup> /µl) (%)	0.1 (3)	0-0.5 (0-3)	
Lymphocytes (x10 <sup>3</sup> /µl) (%)	0.2 (4)	0.4-2.9 (8-21)	Low
Monocytes (x10 <sup>3</sup> /µl) (%)	0.2 (5)	0.1-1.4 (2-10)	
Eosinophils (x10 <sup>3</sup> /µl) (%)	0.2 (6)	0-1.3 (0-9)	
Basophils (x10 <sup>3</sup> /µl) (%)	0 (0)	0 (0-1)	
Total protein (g/dl)	8.8	6.0-7.5	High
Fibrinogen (mg/dl)	400	150-300	High

azotaemia and hyperproteinaemia, but in this case report, only hyperproteinaemia was consistent with pyometra while the other haematological findings were consistent with canine ehrlichiosis and hepatozoonosis which were co-infections in the bitch. Hyperfibrinogenaemia observed in this case could also be due to the ongoing inflammatory response as reported by Segawa *et al.* (2018).

Results from the serum biochemical panel (Table 2) revealed moderate panhyperproteinemia with normal albumin: globulin ratio, mildly elevated aspartate aminotransferase with borderline elevated alkaline phosphatase. These results serve as a pointer to dehydration with mild hepatocellular or muscular injury. Atata *et al.* (2018) earlier reported that an increase in serum urea, creatinine, total protein and albumin concentrations were consistent biochemical indicators of dehydration in dogs, therefore the increased serum concentrations of creatinine, total protein and albumin in the bitch confirms dehydration.

**Table 2:** Serum chemistry parameters of Rottweiler bitch with CEH-Pyometra complex complicated with ehrlichiosis and hepatozoonosis

Serum chemistry parameter	Value	Reference interval	Remark
Total protein (g/dl)	8.4	5.4-7.5	High
Albumin (g/dl)	3.3	2.3-3.1	High
Globulin (g/dl)	5.1	2.7-4.4	High
Aspartate aminotransferase (μl)	25	13-15	High
Alanine aminotransferase (μl)	107	10-109	
Alkaline phosphatase (μl)	116	1-114	High
Blood urea nitrogen (mg/dl)	23	8-28	
Creatinine (mg/dl)	1.9	0.5-1.7	High

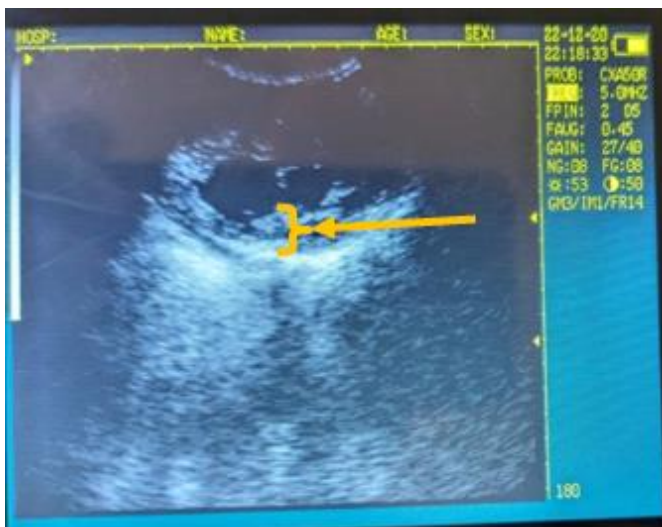
The pelvic aspirate was brown in colour, thin in consistency, with a total protein concentration as 9.0g/dl and a specific gravity of 1.047. The cytology of the pelvic aspirate revealed a pink and proteinaceous background with cellular debris and numerous red blood cells. The cellular outlines of the polymorphonuclear and mononuclear cells were distorted. The predominant cells were neutrophils with a few macrophages and lymphocytes. These findings are suggestive of pelvic abscess or closed pyometra.

Pyometra caused severe abdominal enlargement in the animal in the current study. The vaginal microbial culture revealed moderate growth of *Escherichia coli* which was susceptible to Amoxicillin. *Escherichia coli* has been observed to be the most common microbial cause of CEH-Pyometra (Quartuccio *et al.*, 2020).

Ultrasound was performed using a Veterinary Ultrasonic Scanner with 2.5–5 MHz sectorial probes. The ultrasound scan showed thickened layers of the endometrial wall and distended anechoic sacs in the uterus (Figure 1). The uterus was filled with

heterogenous echogenic material (Figure 2). suggestive of pus accumulation in closed pyometra.

The prognosis of this case was made worse by the co-morbidities of ehrlichiosis and hepatozoonosis, with each as a stand-alone infection capable of causing death in bitches. Also, the late presentation of the bitch to the clinic could have contributed to the death of the bitch despite intensive care. The diagnostic work up of clinical cases



**Plate I:** Uterine wall hyperplasia seen on ultrasound



**Plate II:** Uterus filled with heterogenous echogenic material suspected to be pus

benefit from imaging, and this case of CEH-pyometra complex is one such example.

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#### Conflict of Interest

The authors declare that there is no conflict of interest.

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