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A case of pyometra: CEH complex with linear foreign body in rottweiler bitch

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Abstract
A 6-year-old female rottweiler was presented with the history of discharge from the vagina, inappetence, lethargy, dull and depressed. Abdominal lateral x ray revealed uterine involvement with linear foreign body. Transabdominal ultrasonography examination revealed multiple anechoic sacculations with thickened uterine wall. Haematological evaluation showed anaemia, increased BUN and Creatinine level. Based on the history, Radiography, Transabdominal ultrasonography and hematology it is diagnosed as a rare case of pyometra – CEH complex and linear foreign body. It was successfully treated by ovariohysterectomy. More recent and successful medical treatments have evolved, since ovariohysterectomy remains to be the choice of treatment for pyometra.

Keywords: Pyometra – CEH complex, ultrasonography, linear foreign body

Introduction
Pyometra is a frequent reproductive condition in females over the age of eight, in which the physiological actions of progesterone on the uterus play a significant role. The illness typically strikes after oestrus and typically during the luteal phase (Blendinger *et al.*, 1997) [3]. Pyometra's pathogenesis is only partially understood, but it is widely accepted that a primary hormonal imbalance or abnormal reaction to normal levels of oestrogen and progesterone affects the uterine epithelial cells and makes it easier for bacteria to adhere to host cells, colonise them, and grow (Noakes *et al.*, 2001; Hagman and Kuhn, 2002) [16, 11]. Pyometra is often treated with an ovariohysterectomy. The primary benefit of ovariohysterectomy over medicinal therapy is that it is both a preventative and curative measure for pyometra recurrence. (Fieni *et al.*, 2014) [7]. Many medical therapy options are available to maintain fertility or if surgery or anaesthesia is to be avoided. Progesterone-receptor antagonists (aglepristone and mifepristone), prostaglandins (dinoprost and cloprostenol), dopamine agonists (cabergoline), and various combinations of these drugs are examples of medications that can be used to treat pyometra medically (Gilbert *et al.*, 1989; Gabor *et al.*, 1999; Jurka *et al.*, 2010; Gobello *et al.*, 2003; Pal Rahul Keshavprasad *et al.*, 2023) [9, 8, 14, 10, 15]. Pyometra in dogs is typically linked with cystic endometrial hyperplasia. Due to an overgrowth of the typical vaginal flora (*E. coli*, *Staphylococci*, *Streptococci*, and *Pseudomonas aeruginosa*) that penetrates the uterus during the distress phase, CEH frequently predisposes the dog to pyometra (Arora *et al.*, 2006) [2].
When dogs seek emergency veterinary care, foreign bodies are a common diagnosis, but they frequently pose a diagnostic problem (Clark 1968, Aronson *et al.*, 2000, Hayes 2009, Sharma *et al.*, 2011) [4, 1, 12, 17]. In comparison to non-linear foreign bodies (NLFB), linear foreign bodies (LFB) have a higher frequency of postoperative complications and a worse prognosis (Evans *et al.*, 1994, Hayes 2009) [6, 12].

History and clinical observations
A six year old rottweiler, weight 35 kg, whelped once brought to the Madras Veterinary College Small Animal Gynaecology and Obstetrics with the history of anorexia, restlessness, dull and depressed, lethargy, pyrexia and purulent vaginal discharge. On clinical examination, animal was dull and depressed, temperature 104.5◦F, heart rate 132/min, respiratory rate 48/min, CRT > 2 secs and congested conjunctival membrane noticed. On external genitalia examination, vulva was swollen with pale pink and moist with purulent discharge.

In vaginal examination foul smelling purulent discharge with some blood clots noticed. Further the animal was subjected to blood test, Radiography and ultrasound examination.

Diagnosis and surgical management

In haematology (Table 1) severe anaemia Hb 6.9 g/dl, leuckocytosis 46,800/cmm and neutrophilia 9600/cmm was noticed on 01.06.23. Serum profile shown hypercholesterolaemia 302 mg/dl, hyperphosphataemia 9.18 mg/dl, and increased creatinine value 2.26mg/dl showed in Table 2. Ultrasonography showed multiple anechoic sacculation (Fig: 1). Radiography examination showed linear foreign body in the abdomen with uterine involvement (Fig: 2). Advised the owner to do blood transfusion and exploratory laporatomy with ovariohysterectomy, but the owner refused to co -operate for further treatment. Owner brought the animal again after 4 days with same condition. Again the animal was subjected to all the diagnostic test on 05.06.23. In haematology (Table 1) severe anaemia Hb 6.0 g/dl, leuckocytosis 34,500/cmm and neutrophilia 9000/cmm were noticed. Further serum profile shown Hypercholesterolaemia 340 mg/dl, Hyperphosphataemia 8.79 mg/dl, and increased creatinine value 5.01mg/dl showed in Table 2. Ultrasonography showed multiple anechoic sacculation. Radiography examination showed linear foreign body in the abdomen but the position was changed with uterine involvement (Fig: 3). Suggested the owner for blood transfusion and exploratory laporatomuy with ovariohysterectomy. Blood transfusion (10 ml/kg) was done by blood collected from a donor dog after cross matching and haematological values after blood transfusion was showed in the Table 3.

Table 1: Haematological parameters

Haemogram (1/6/23)	Haemogram (5/6/23)	Differential count (1/6/23)	Differential count (5/6/23)
Hb = 6.9 g/dl	Hb = 6.0 g/dl	Neutrophils = 96	Neutrophils = 90
PCV = 17.5%	PCV = 15.8%	Lymphocytes = 2	Lymphocytes = 5
RBC = 3.13 m/cmm	RBC = 2.81m/cmm	Monocytes = 2	Monocytes = 5
WBC = 46800/cmm	WBC = 34500/cmm	Eosinophils = 0	Eosinophils = 0
Platelets = 5,72,000/cmm	Platelets = 7,02,000/cmm	Basophils = 0	Basophils = 0
Blood parasite = Negative	Blood parasite = Negative	Blood picture = Hypochromasia Neutrophilia	Blood picture = Hypochromasia Neutrophilia

Table 2: Biochemical parameters

Serum Profile (1/6/2023)	Serum profile (5/6/23)
Glucose = nil mg/dl	Glucose = 62 mg/dl
Cholesterol = 302.8 mg/dl	Cholesterol = 340 mg/dl
ALT = 66 U/L	ALT = 18 U/L
ALP = 139 U/L	ALP = 278 U/L
BUN = 24.22 mg/dl	BUN = 25.39 mg/dl
Creatinine = 2.36 mg/dl	Creatinine = 5.01 mg/dl
Calcium = 11.26 mg/dl	Calcium = 10.89 mg/dl
Phosphorous = 9.18 mg/dl	Phosphorous = 8.79 mg/dl
Total protein = 7.10 g/dl	Total protein = 7.00 g/dl
Albumin 2.20 g/dl	Albumin 2.80 g/dl

The dog was administered with inj diazepam @ 0.2 mg per kg b.wt IV as the pre – anaesthetics and anaesthesia was induced with propofol @ 2mg per kg b.wt slow IV and anaesthesia was maintained with gaseous anaesthetic Isoflurane. Incision was made at ventral midline approach near the umbilicus and pus filled uterus (Fig.5) was removed and it was sutured with (Polyglycolic acid) PGA -1. Then the incision was extended towards cranially and searched for linear foreign body. The linear foreign body was found attached with omentum was removed and it was removed (Fig: 4). Surgical incision was closed by continuous lockstitch suturing of muscle layer using (Polyglycolic acid) PGA - 1. Subcutaneous layer was closed by continuous suture technique using (Polyglycolic acid) PGA 1-0 and skin was sutured by horizontal matress using non absorbable (Polyglycolic acid) PGA 2-0. After surgery Inj Ringers Lactate 5ml/kg b.wt was given slow intravenously BID, antibiotic amoxycillin and clavulanic acid @ 10 mg /kg b.wt given Intravenously BID, Metronidazole 15 mg / kg b.wt was given Intravenously BID, Tribivet 2.5 ml given IM, Pantaprazole 1mg/kg b.wt was given intravenously for post operative care with dressings on alternate days. Inj Darbepoetin 0.5 ug/kg body weight s/c was given on weekly interval for 3 weeks along with inj iron sucrose 1mg/kg slow iv on alternate days diluted with Normal saline. Haematological findings after ovariohysterectomy were shown in the Table 3. Animal recovered uneventfully from anaemia with 3 week postoperative care. Serum values also were also found to be normal was shown in the Table 4.

Table 3: Haematological parameters after blood transfusion and OHE

Haemogram (After Blood transfusion)	Haemogram (First week after OHE)	Haemogram (Second week after OHE)	Haemogram (Third week after OHE)
Hb = 7.8 g/dl	Hb = 8.9	Hb = 9.8	Hb = 13.5 g/dl
PCV = 21%	PCV = 27%	PCV = 33%	PCV = 42%
RBC = 3.8 m/cmm	RBC = 4.1 m/cmm	RBC = 4.9 m/cmm	RBC = 6.2 m/cmm
WBC = 32500/cmm	WBC = 29600 /cmm	WBC = 18500/cmm	WBC = 12500/cmm
Platelets = 6,00,100/cmm	Platelets = 5,10,000/cmm	Platelets =4,80,000/cmm	Platelets = 5,12,000/cmm
Blood parasite = Negative	Blood parasite = Negative	Blood parasite = Negative	Blood parasite = Negative

Table 4: Biochemical parameters after OHE

Serum Profile (One week after OHE)	Serum profile (2 weeks after OHE)
Glucose = 85 mg/dl	Glucose = 93 mg/dl
Cholesterol = 270.8 mg/dl	Cholesterol = 220 mg/dl
ALT = 65 U/L	ALT = 55 U/L
ALP = 148 U/L	ALP = 158 U/L
BUN = 24.22 mg/dl	BUN = 25.39 mg/dl
Creatinine = 2.2 mg/dl	Creatinine = 1.1 mg/dl
Calcium = 9.26 mg/dl	Calcium = 10.86 mg/dl
Phosphorous = 6.18 mg/dl	Phosphorous = 6.79 mg/dl
Total protein = 6.10 g/dl	Total protein = 6.00 g/dl
Albumin 2.50 g/dl	Albumin 2.60 g/dl

Fig 1: Anechoic sacculation with CEH

Fig 2: Linear foreign body position on 1/6/23

Fig 3: Linear foreign body position on 5/6/23

Fig 4: Linear foreign body after removal

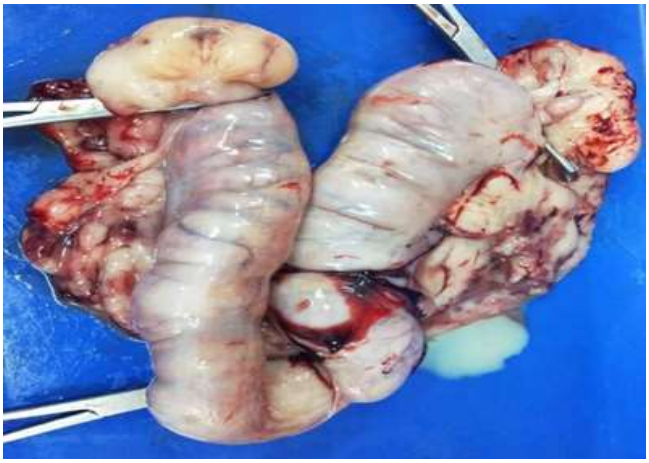

Fig 5: Pus Filled uterus with CEH

Discussion

In the pathophysiology of the Pyometra complex of cystic endometrial hyperplasia (CEH), progesterone plays a role. While progesterone alone does not cause CEH, oestrogen increases its stimulatory actions on the uterus. Progesterone and oestrogen both cause the branching and coiling of the endometrial glands, which trigger the start of secretion. The distribution of steroid receptors in the uterus of bitches is influenced by the exogenous or endogenous concentration of circulating steroid hormones, particularly oestrogen and progesterone. The pathophysiology of the pyometra complex in the bitch may be significantly influenced by the regulation of oestrogen and progesterone receptor expression in endometrial glands. Progesterone normally causes the endometrium to downregulate oestrogen receptors, which stops the proliferative process, however in CEH, this mechanism didn't work. In the pathogenesis of pyometra, bacterial infection is crucial. Myometrium and endometrium that had been sensitised by progesterone displayed a preference for E. coli, which is frequently isolated from uterine fluid as a typical component of the vaginal and vulval microbiota. Early metestrus is when the endometrium begins to produce E. coli receptors. If an infection occurs during this period, bacterial colonisation in the uterus results in pyometra (Smith 2006) [18]. Linear foreign bodies were classified as compliant objects anchored at one anatomic site, inducing plication through one or more aboral sites in the gastrointestinal tract. Compared to dogs presenting with NLFBs, LFBs had increased reports of anorexia, vomiting, lethargy, and pain on stomach palpation. Increased incidences

of intestinal necrosis, perforation, and peritonitis may have contributed to the increased prevalence of abdominal pain in dogs with LFB. Compared to dogs with NLFB, dogs with LFB required noticeably more gastrotomies, enterotomies, intestinal resections, and anastamoses. This result is consistent with the foreign body's linear form and the challenge of removing it with a single gastrointestinal incision (Hobday *et al.,* 2014) [13]. But the case presented here was pyometra with CEH complex and intraabdominal linear foreign body, we removed the pus filled uterus with CEH and unfortunately we found and removed the linear foreign body in the omentum. So linear foreign body location was changed compared to first radiography in second radiography image but it has not pierced the visceral organs. Successful removal of pus filled uterus with CEH and linear body may be a reason for the survival of the dog from this major problems.

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