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Surgical management of comorbid pyometra and cystic calculus in a Spitz dog

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Abstract

A six year old female nulliparous spitz dog weighing 4.5 kg was presented with the history of anorexia, vomiting, oliguria and not voiding faeces for past 3days. On clinical examination, distended abdomen, moderate dehydration and pus discharge from the vulva were observed. Radiological examination revealed cystic calculus and ultrasonography confirmed the presence of calculus in the bladder along with distended and sacculated uterine shadow suggestive of pyometra. Hemato-biochemical analysis revealed absolute neutrophilia with increased blood urea nitrogen and creatinine level. Under diazepam premedication, propofol induction, anaesthesia was maintained with isoflurane using variable vaporizer setting. Cystotomy was performed and removed a single calculus measuring around 3 cm lengths and the bladder was closed with PGA 3-0 in double layer inversion suture pattern. Ovariohysterectomy was performed as per standard operating procedure. Postoperatively fluid therapy, antibiotics, opioids and urinary acidifiers were administered. Urine analysis revealed phosphate crystals. Animal recovered uneventfully.

Keywords: Nulliparous female dog, pyometra, cystic calculus

Introduction

Canine pyometra is one of the most common reproductive tract infection in intact bitch, which is less than 10 years of age, during diestrus period [1]. It is a hormone induced uterine bacterial infection and inflammation, which results in pus filled uterus with systemic illness. Risk factors for pyometra include nulliparity and hormonal therapy with oestrogen and progesterone [2, 3, 4]. The elevated progesterone levels suppress uterine contractions and stimulate a uterine gland secretion which favour the bacterial growth within the uterus [5] and inhibits the effect of neutrophils in uterus. The microorganism which is isolated in pyometra uterus is mostly of gram negative bacteria [6] *Staphylococcus aureus*, *E.coli* and *Pasteurella* origin. It may be open cervix or closed cervix pyometra.

Cystic calculi are more common occurrence in dogs. The etiology are diet, urinary tract infections with urease producing bacteria, breed predisposition, stagnation of urine formed in any part of urinary tract. Urinary tract infection associated with pyometra in bitches [7]. Types of stones include struvite, calcium oxalate, urate, cystine, silicate and calcium phosphate, in which struvite and calcium oxalate are more common [8].

Materials and Methods

A six year old female nulliparous Spitz dog weighing 4.5 kg was presented to the Veterinary Clinical Complex of Veterinary College and Research Institute, Tirunelveli, Tamil Nadu with the history of anorexia, vomiting, oliguria and not voiding faeces for past 3 days. Clinical examination revealed moderate dehydration of (CRT > 4 sec), distended abdomen which was doughy in consistency and edematous vulva with purulent vaginal discharge. Radiographic examination confirmed the presence of radiopaque cystic calculus with distended and sacculated uterine shadows (Fig. 1). Positive contrast radiography was done to confirm the presence of calculus in bladder. Ultrasonography revealed mild hyperechoic border with hypoechoic lumen with sacculations inside uterus suggestive of pyometra and hyperechoic shadow inside bladder suggestive of a cystic calculus (Fig. 2). Whole blood was collected for hematology and serum biochemical analysis. Hemogram was performed by Automated Cell Counter, Serum biochemical values were measured spectrophotometrically with standard diagnostic kits using Semi Automated Biochemical Analyzer. Collected urine sample was processed for urine analysis, microbial culture and antibiogram (Fig. 3).

The case was decided for surgical intervention, since medical interventions was not feasible.

Table 1: Parameter pre-operative values post-operative values

Parameter	Pre-Operative Values	Post-Operative Values
Haemoglobin (g/dl)	13.6	14.5
PCV (%)	30.6	30.6
RBC (10 ⁶ /μL)	4.04	5.70
WBC (10 ³ /μL)	131100	16900
Platelets (10 ³ /μL)	2.59	5.47
Neutrophils	94	64
Lymphocytes	06	32
Blood picture	Neutrophilia with left shift	Normal
BUN (mg/dl)	282.86	40.2
Creatinine(mg/dl)	2.4	0.6
Total protien (g/dl)	8.2	5.6
Albumin (g/dl)	1.9	2.1
Glucose (mg/dl)	45	64
Alkaline phosphate (u/l)	188	114
Sodium(mmol/dl)	131.69	120
Potassium(mmol/dl)	1.79	3.9

Table 2: Urine analysis

Urinary parameters	Pre-operative	Post-operative
Colour	Yellow	Straw yellow
Transparency	Slight turbid	Clear
PH	8.9	5.5
Specific gravity	1.030	1.020
Blood	++	Negative
Protein	+	Negative

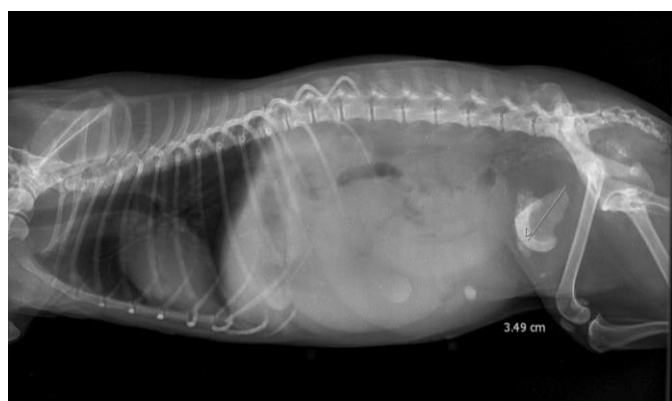


Fig 1: Presence of calculus and distended uterine shadow

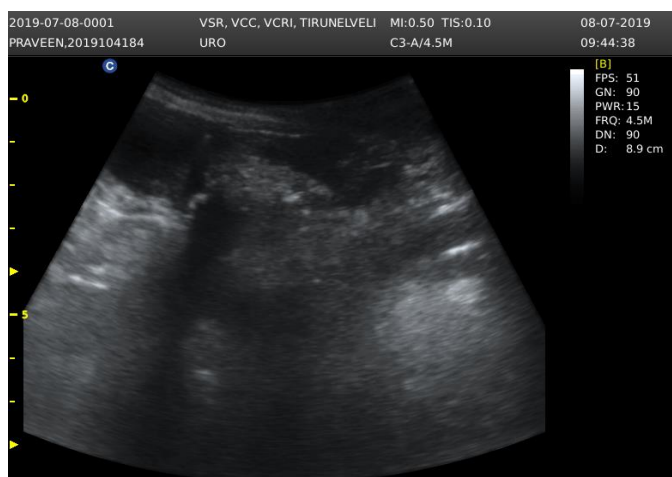


Fig 2: Hyperechoic shadowing in the bladder, hypo and hyperechoic shadowing of uterus

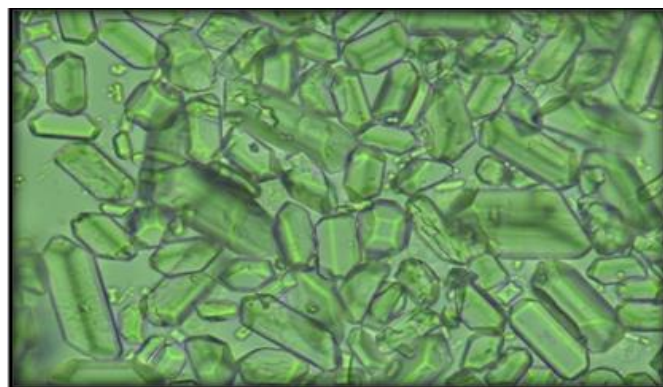


Fig 3: Microscopic examination of calculus revealed “Coffin lid” shaped triple phosphate (struvite crystal)



Fig 4: Calculus removed from bladder

Pre-operatively the animal was stabilized with Inj. Ringer’s lactate 10ml/kg i.v followed by administration of antibiotics. The animal was premedicated with Inj. Diazepam 0.5mg/kg, induced with Inj. Propofol 2 mg/kg.i.v and maintained under 3% Isoflurane anaesthesia in non breathing system with 100% oxygen supplementation for initial 5minutes followed by 1.5% Isoflurane. The bitch was positioned in dorsal recumbency and midline celiotomy incision was made and the bladder was exteriorized. The bladder was emptied by catheterization and a cystic calculus measuring about 3.5 cm length (Fig. 4) was removed and bladder was closed PGA 3-0 in double layer inversion suture pattern and repositioned. Then the sacculated uterus was exteriorized and ovariohysterectomy was performed. The linea alba, muscles and skin were closed by standard procedure. The animal was post operatively treated with fluids, antibiotics, opioids and urinary acidifiers. Sutures were removed on 9th postoperative day and the animal recovered uneventfully without any complication. Post-operative hematological and biochemical parameters were within normal physiological limits. Histopathology of uterus revealed cystic endometrial hyperplasia-pyometra complex.

Result and Discussion

History, clinical signs, ultrasound and radiography revealed that the case was pyometra with concurrent cystic calculus. In present case report, the nulliparous bitch was affected, with pyometra [2]. Repeated exposure to endogenous progesterone leads to cystic endometrial hyperplasia with increased glands secretions, which favored bacterial growth and resulted in pyometra [5]. The clinical signs like anorexia, vomiting, polyuria, polydipsia, abdominal distension and purulent vaginal discharge were noticed. The toxins released due to pyometra induced pathological insult on organs, which were reflected as neutrophilia with left shift and leukocytosis [4] and

elevated blood urea nitrogen and creatinine. Pyometra could be treated medically and surgically depends on the status of the affected bitch. Medical therapy is indicated in uncomplicated open cervix pyometra. But in the present case surgery was resorted due to the concurrent cystic calculus.

Animal maintained with inhalation anaesthesia reduces the morbidity and mortality in older dogs compare with injectable anaesthetic drugs^[9]. The microbial culture and identification revealed the growth of *Staphylococcus aureus*. *Escherichia coli* were the frequently identified organism with less common incidence of *Staphylococcus* species^[10]. Urinary tract infection as a secondary to pyometra in bitches^[7]. *Escherichia* and *Staphylococcus* species infection in the urinary tract of bitches diagnosed for urinary calculi due struvite urolithiasis as in the present case report^[11]. The urease producing bacteria in urogenital tract predisposes the formation of calculi^[12].

The clinical signs noticed were anuria, oliguria or hematuria^[12]. In the present case report it was evident that the cystic calculus was secondary to pyometra and ovariohysterectomy and cystotomy through celiotomy was the only option and the animal recovered without any complications.

Conclusion

In the present case report described a case of pyometra and secondary cystic calculus treated successfully by ovariohysterectomy and cystotomy through celiotomy under inhalation anaesthesia. It is concluded that comorbid pyometra and cystic calculus is rarely reported in dogs.

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