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Canine pyometra: Clinical presentation, ultrasonographic findings and surgical outcome in clinical population: A case report

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ABSTRACT

Canine pyometra is a condition in which purulent exudate collects in the uterus, and it is the most common reproductive disease in dogs. An 8-year-old Labrador was presented with pyometra. On clinical evaluation, all physiological parameters were within normal ranges, and the patient was suitable for general anesthesia. The highest incidence of pyometra was seen in the 6–8 year age group, mostly in nulliparous animals and in the Labrador breed. Ovariohysterectomy was performed at the Teaching Veterinary Clinical Complex (TVCC), College of Veterinary Science and Animal Husbandry, Anjora, Durg. The animal was anaesthetised with Atropine Sulphate IM, and Xylazine IM, followed by Ketamine IV. The surgical wound was closed with standard suture patterns. Postoperatively, the animal received antibiotic and analgesic therapy. Skin sutures were removed on the 10th day after surgery, and the patient recovered uneventfully without any complication. Histopathological examination was performed on postoperative uterine and ovarian tissues obtained from TVCC.

Keywords: Nulliparous, Follicular degeneration, Ovariohysterectomy

Introduction

Pyometra occurs when purulent exudate accumulates inside the uterine lumen, and it remains the most common reproductive issue in canines (Hagman, 2018) [1]. It usually appears during the luteal phase, and in many reports *Escherichia coli* is the organism most often isolated (Kassé *et al.*, 2016) [2]. Other frequently reported agents include *Staphylococcus pseudointermedia* and *Streptococcus canis*. More recent work has also suggested that less typical pathogens may play a role, such as *Brucella abortus*, *Corynebacterium* spp., and possibly *Porphyromonas* spp. (Wareth *et al.*, 2017) [3]. In most dogs, canine pyometra begins with relatively mild clinical signs such as polydipsia, polyuria, and vaginal discharge. If treatment is delayed, it can progress to peritonitis, sepsis, and impaired function of multiple organs, making it a life-threatening infection (Agostinho *et al.*, 2014) [4]. Therefore, this report presents a detailed account of canine pyometra in an 8-year-old Labrador bitch, focusing on incidence, clinical presentation, diagnosis, and surgical management.

Case history and clinical examination

An 8-year-old intact female Labrador Retriever was presented to the Veterinary Clinical Complex with a history of progressive lethargy, reduced appetite, increased water intake, and frequent urination. The owner reported that clinical signs had developed approximately 2–3 weeks after the last oestrus. The bitch had not been ovariohysterectomized previously and had no history of recent reproductive treatment.

On clinical examination, the animal was dull and depressed, with a mildly elevated rectal temperature and increased heart rate. The mucous membranes were mildly congested, and capillary refill time was slightly prolonged. Abdominal palpation revealed mild abdominal discomfort and an enlarged tubular structure suggestive of a distended uterus. No obvious vulvar discharge was observed, suggesting the possibility of closed-cervix pyometra. The following table shows breed frequencies of dogs affected with pyometra.

Ultrasonography showed enlarged, tubular uterine structures with multiple cross-sectional fluid-filled lumens (Fayer *et al.*, 1991) [5]. The uterine lumen contained mainly anechoic to hypoechoic fluid, giving the characteristic dark/black appearance. Some internal echogenic material or debris was present within the fluid-filled lumen, which may represent pus, cellular material, or inflammatory debris. The uterine wall appeared thickened. Bilateral uterine horn involvement appeared likely, with multiple distended sacs or segments visible.

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Figure 1. Ultrasonography showed enlarged, tubular uterine structures with multiple fluid-filled lumens (Fayrer *et al.*, 1991). The uterine lumen contained mainly anechoic to hypoechoic fluid with some echogenic debris, suggestive of pus or inflammatory material. The uterine wall appeared thickened, with bilateral uterine horn involvement and multiple distended segments

Treatment and discussion

Preoperative preparation

Ovariohysterectomy is the treatment of choice in most cases of pyometra and generally results in rapid recovery with minimal risk of recurrence. The operation was performed at the Teaching Veterinary Clinical Complex, Durg. The animal was fasted for 12 hours, and water was withheld for 6 hours. Routine preoperative stabilization of bitches with uncomplicated pyometra mainly involved rehydration by IV infusion of a balanced isotonic solution (0.9% normal saline). The dog was premedicated with Atropine sulphate (0.02–0.04 mg/kg IM) and Xylazine (1–2 mg/kg IM) to induce sedation, analgesia, and muscle relaxation. For general anesthesia, induction was achieved with ketamine (5 mg/kg IV) and maintained with a cocktail of xylazine and ketamine. The dog was placed in dorsal recumbency, and hair over the abdominal area was clipped and shaved. The skin was then washed thoroughly with soap and clean water to remove dirt, grease, and debris. After clipping and shaving, antiseptic preparation of the skin was performed. The operative area was scrubbed with povidone-iodine in a circular manner. Sterile drapes were applied to isolate the surgical field completely. Intravenous access was secured, and fluid therapy was initiated to maintain hydration and circulatory stability. Broad-spectrum antibiotics and analgesics were administered preoperatively as prophylaxis.

Surgical procedure

The animal was placed in dorsal recumbency. A ventral midline laparotomy was performed through a caudal abdominal incision. Skin, subcutaneous tissue and linea alba were incised. The ovarian bursa was clamped by artery forceps and withdrawn for ligation. The suspensory ligaments were transected to mobilize the ovaries, and the opening was made in the broad ligament by forceps. The vessels in the broad ligaments may be enlarged due to uterine inflammation (Fig. 3). Artery forceps were used to ligate the vessels and the chances of hemorrhage were checked. Double ligature with polydioxanone 2-0 or monofilament absorbable suture material was used to ligate ovarian pedicle, and both the ovaries were removed (Fig. 4). Care was taken to avoid damage to adjacent blood vessels. The broad ligament was

severed, and the body of the uterus was withdrawn (Fig. 5). For closing muscle and subcutaneous tissue, Vicryl 1-0 was used in a simple continuous manner, while skin was closed using Nylon 1-0 suture in a simple interrupted pattern. The excised mass was sent for histopathological examination.



Figure 2. Picture showing the female labrador dog being operated in TVCC



Figure 3. Intraoperative image of enlarged, pus filled uterus in a bitch with pyometra

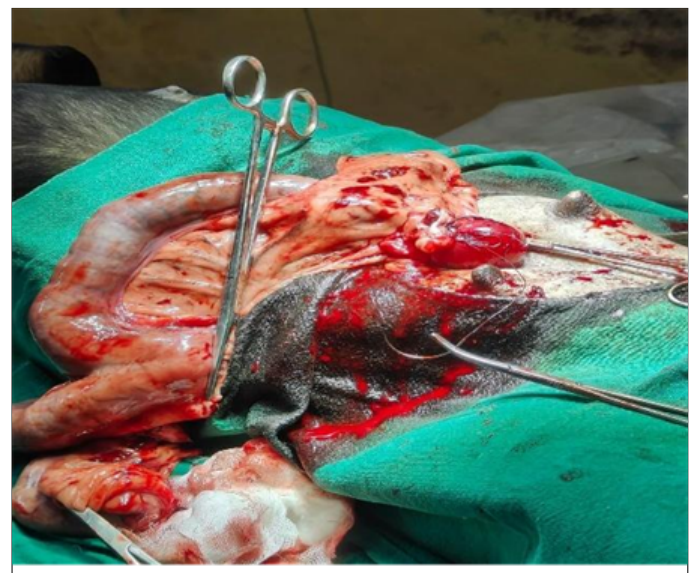


Figure 4. Showing ligated vessel and parts of uterus

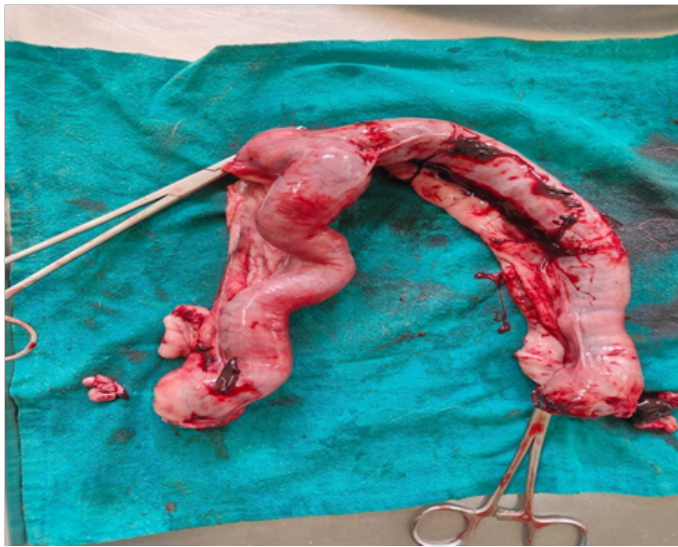


Figure 5. Showing pus filled uterus and ovaries removed after operation

Post operative care

The dog was treated postoperatively with Injection Asucef @ 5–10 mg/kg body weight, intramuscularly, once daily for five days, as a broad-spectrum antibiotic to prevent postsurgical bacterial infection. Injection Merideca® @ 0.07 mg/kg body weight was administered intramuscularly once daily for 3 days to control inflammation and reduce postoperative oedema. Injection Melonex® @ 0.2 mg/kg body weight was administered intramuscularly for pain relief. Postoperative heart rate was 90 bpm. An antiseptic dressing of the surgical site was performed using liquid povidone-iodine. Mupirocin ointment was applied topically to the incision site once daily for 15 days to prevent secondary bacterial infection and promote epithelialization. Skin sutures were removed on the 10th day after surgery. The patient recovered uneventfully without any complications.

Histopathological findings

After surgical excision, the collected tissue sample was washed thoroughly with normal saline to remove excess blood and other debris. The specimens were then trimmed into approximately 2 mm thick pieces and fixed in 10% formalin following standard histopathological procedures. The fixed tissues were processed routinely and embedded in paraffin wax. Paraffin blocks were sectioned at a thickness of 3–5 mm, and the sections were stained with Hematoxylin and Eosin (H&E) as per the standard protocol (Luna, 1968) [6]. Histopathology of the endometrium revealed marked degenerative and inflammatory changes characterized by degeneration and desquamation of the endometrial epithelium, dilatation of endometrial glands, stromal oedema, and infiltration of inflammatory cells, predominantly neutrophils. The endometrial architecture was markedly distorted, with accumulation of inflammatory exudate within the uterine lumen and glandular spaces (Fig. 6). Histopathology of the ovary revealed inflammatory changes characterized by prominent infiltration of neutrophils within the ovarian interstitium. The inflammatory cells were distributed between the ovarian stromal tissues, indicating

an active inflammatory response. These findings were suggestive of ovarian inflammation (oophoritis) associated with the underlying pyometra (Fig. 7). Histopathology of the ovary revealed marked distortion of the normal ovarian architecture with multiple irregularly shaped follicular spaces. The ovarian wall appeared markedly thickened, with associated stromal disorganization and degenerative changes (Fig. 8).

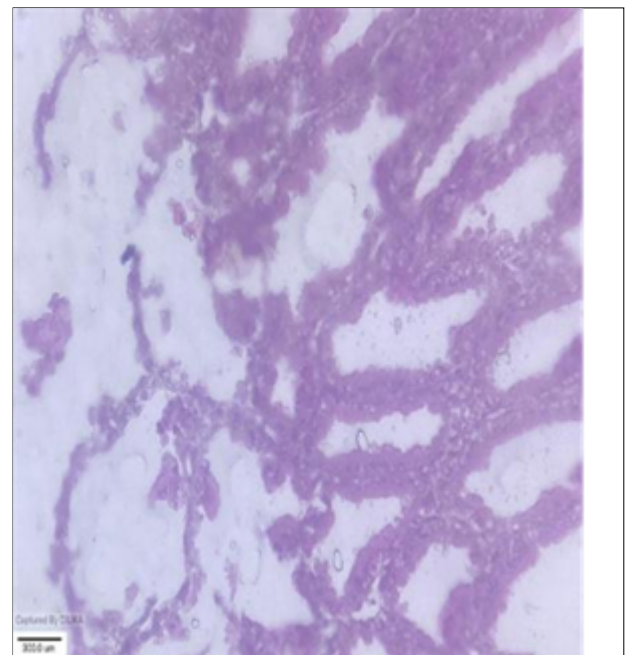


Figure 6. Uterus of a female dog with pyometra - Endometrium showing marked degenerative and inflammatory changes

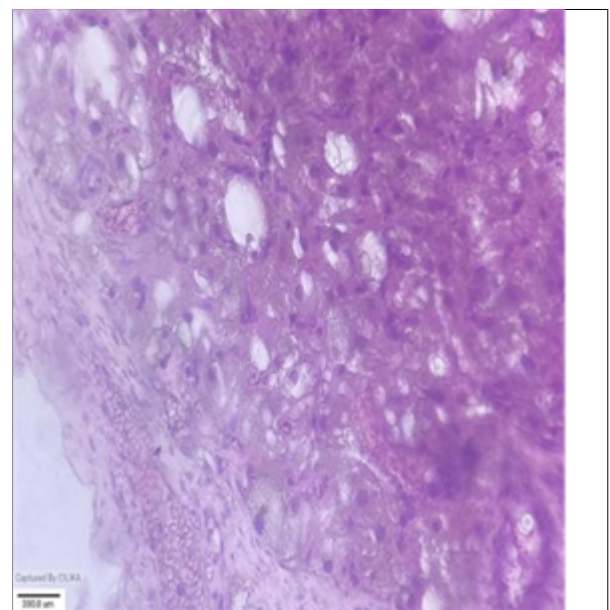


Figure 7. Ovary of a female dog showing inflammatory cellular infiltration of neutrophils in ovarian interstition

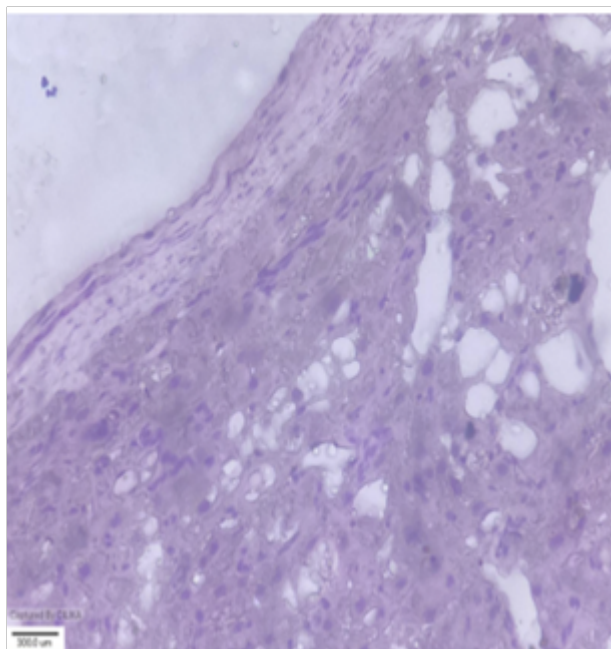


Figure 8. This figure shows distortion and multiple irregular follicular spaces, degeneration and necrotic changes and thickening of the ovarian wall

Discussion

Canine pyometra is a common and potentially life-threatening uterine disease, particularly in sexually intact middle-aged and older bitches, and is associated with progesterone-dominated diestrus and bacterial infection. (Fossum, 2019) [7]. The present case showed characteristic clinical and gross pathological findings, including a markedly enlarged, pus-filled uterus, which are consistent with the typical presentation of canine pyometra. The histopathological findings of endometrial epithelial degeneration, desquamation, glandular changes, stromal edema and inflammatory-cell infiltration support the diagnosis of severe inflammatory uterine disease associated with pyometra. Ovarian histopathology showing distorted follicular spaces, degeneration, necrotic changes and thickening of the ovarian wall indicates concurrent ovarian structural alterations, although these findings should be interpreted cautiously unless definite inflammatory-cell infiltration is demonstrated. Ultrasonography was useful for demonstrating the fluid-filled and enlarged uterus and therefore supported the clinical diagnosis of pyometra. Ovariohysterectomy remains the definitive treatment for most clinically affected bitches because it removes the infected uterus and eliminates the ovarian source of reproductive hormones. Appropriate preoperative stabilization, fluid therapy, antimicrobial treatment, careful surgical technique and perioperative analgesia are important for reducing complications in pyometra

patients undergoing surgery. (Lamont *et al*, 2019)- Perioperative analgesia is particularly important because ovariohysterectomy produces both somatic and visceral nociception, and multimodal analgesic techniques can improve postoperative comfort.

Conclusion

Successful ovariohysterectomy was performed in the eight-year-old Labrador bitch with pyometra and shows removal of the infected uterus and ovaries, with an uneventful recovery. The gross and histopathological findings of ovary and uterus confirmed marked uterine inflammatory and degenerative changes associated with pyometra.

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