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Popular Article

Canine & Pyometra: Diagnosis and Its Management

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Introduction

Pyometra is one of the most serious reproductive disorders affecting intact female dogs and, less commonly, cats. It is a life-threatening uterine infection that requires prompt veterinary attention. For pet owners, pyometra often appears suddenly in an otherwise healthy animal, while for veterinarians it represents a true reproductive emergency with potentially fatal outcomes if diagnosis or treatment is delayed.

Understanding the Endometritis–Pyometra Complex

Pyometra is part of the Endometritis–Pyometra Complex (EPC), a condition characterised by bacterial infection of the uterus with accumulation of pus within the uterine lumen. It typically develops during the diestrus phase, when progesterone levels are high, and the cervix is closed. Progesterone increases uterine glandular secretions, reduces uterine contractions, and suppresses local immune defences—creating an ideal environment for bacterial growth.

Over repeated estrous cycles, especially when pregnancy does not occur, the uterine lining undergoes progressive changes such as cystic endometrial hyperplasia, which further predisposes the uterus to infection.

Why Pyometra Is Clinically Important

Pyometra is among the most common emergency surgeries in intact female dogs. If left untreated, it can rapidly progress to septicaemia, systemic inflammatory response syndrome (SIRS), renal failure, and even death. The severity of disease depends not only on



the amount of pus in the uterus but also on bacterial virulence and the animal's immune response.

Diagnosis can be challenging, particularly in closed pyometra, where classical vaginal discharge is absent, and systemic signs may resemble other medical conditions.

Age as a Key Risk Factor

Age plays a crucial role in the development of pyometra. Studies show that the risk increases significantly after five years of age, peaks between 8–10 years, and then gradually declines in very old animals. This pattern reflects cumulative hormonal exposure over multiple estrous cycles.

Each non-pregnant cycle contributes to progressive uterine changes, making middle-aged intact females the highest-risk group. This age-related trend highlights the importance of preventive counselling and elective spaying, especially before animals enter the high-risk age bracket.

Open Versus Closed Pyometra

Pyometra is broadly classified into open and closed forms based on cervical patency. This distinction is clinically important because it affects both presentation and management.

Open pyometra is characterized by vaginal discharge that may be purulent, mucoid, or blood-tinged. Because infected material can drain, systemic signs are often milder, and diagnosis is easier. In carefully selected cases—particularly valuable breeding animals—medical management may be considered.

Closed pyometra, on the other hand, is far more dangerous. The cervix remains closed, allowing pus to accumulate rapidly, leading to severe uterine distension, toxæmia, and a high risk of uterine rupture and septic shock. These cases almost always require **immediate surgical intervention**.

Clinical Signs Owners May Notice

Clinical signs usually appear 4–8 weeks after estrus. The most common finding is abdominal enlargement, reported in over 80% of cases, especially in closed pyometra. Affected animals often appear dull or depressed, ranging from mild lethargy to complete prostration.

Increased thirst and urination are common and may reflect toxin-mediated kidney effects. Dehydration is frequently observed, particularly in open pyometra due to fluid loss through vaginal discharge. Other signs may include vomiting, diarrhoea, anorexia, fever, and foul-smelling discharge in open cases.



Importantly, the severity of illness does not always correlate with uterine size—some animals with moderate enlargement may be critically ill due to severe systemic effects.

Diagnostic Approach

Diagnosis begins with thorough history taking, focusing on recent estrus and reproductive status. Physical examination may reveal abdominal distension, pain on palpation, dehydration, and discharge in open cases. Assessment for sepsis and SIRS is essential.

Laboratory findings commonly include leucocytosis, neutrophilia with left shift, monocytosis, and variable anaemia. Biochemical abnormalities such as elevated alkaline phosphatase, hyperglobulinaemia, and azotaemia may be present, particularly in complicated cases.

Ultrasonography is the diagnostic gold standard, typically revealing an enlarged, fluid-filled uterus with variable echogenicity. It also helps differentiate pyometra from conditions such as mucometra or hydrometra. Radiography may show uterine enlargement but provides less diagnostic detail.

Bacteria Involved in Pyometra

Pyometra is primarily a bacterial disease. *Escherichia coli* remains the most commonly isolated pathogen worldwide, often accounting for up to 70% of cases. Its ability to adhere to the uterine lining and produce potent toxins makes it particularly pathogenic.

Recent studies highlight increasing bacterial diversity, including *Staphylococcus*, *Klebsiella*, *Streptococcus*, *Proteus*, and *Pseudomonas* species, with many cases showing polymicrobial infections. Regional studies from Finland, Brazil, Nepal, and India reveal variations in bacterial prevalence and antimicrobial resistance patterns, emphasizing the need for local surveillance.

Antimicrobial Resistance: A Growing Concern

Antimicrobial susceptibility studies show high effectiveness of drugs such as trimethoprim–sulfamethoxazole and aminoglycosides, particularly amikacin. However, resistance to commonly used antibiotics like ampicillin and amoxicillin-clavulanate is increasing.

Contributing factors include inappropriate dosing, premature discontinuation of therapy, overreliance on empirical treatment, and substandard antibiotic preparations. The emergence of multidrug-resistant organisms, particularly *Pseudomonas* and *Staphylococcus* species, poses a significant challenge and underscores the importance of culture-guided therapy whenever possible.



Management Strategies

Treatment depends on disease severity, cervical status, and breeding value. Surgical ovariohysterectomy remains the treatment of choice for most cases, especially closed pyometra and severely ill animals.

Medical management may be considered in selected open pyometra cases and typically includes appropriate antimicrobials, prostaglandins (cloprostenol) to evacuate uterine contents, and anti-progestins such as mifepristone or aglepristone to counter progesterone effects.

Supportive care is vital and includes fluid therapy, anti-emetics, gastro-protectants, hepato-renal support, and vitamin supplementation. Careful monitoring of renal function is essential, particularly when using potentially nephrotoxic drugs.

Conclusion

Pyometra is a common yet preventable reproductive emergency in dogs and cats. Early recognition, accurate diagnosis, and timely intervention can be life-saving. For pet owners, awareness of abnormal post-estrus signs is crucial, while for veterinarians, evidence-based treatment and antimicrobial stewardship are key to successful outcomes. Preventive spaying remains the most effective long-term strategy to eliminate this life-threatening disease.

