

Pyometra



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Introduction

Pyometra is defined as the acute or chronic suppurative inflammation of the uterine wall. It is commonly characterized by cystic dilation of the endometrial glands (CEH) and accumulation of neutrophil-rich exudate in the uterine lumen. Often, pyometra begins with mild, local signs that, if not treated promptly, can escalate into more life-threatening disease, including peritonitis, sepsis, and multi-organ dysfunction syndrome (MODS).

Etiology and Pathogenesis

These are still two of the highest-researched topics regarding pyometra, as it is a multifactorial disease that is still not completely understood. Most often, pyometra occurs during the luteal phase (usually within two months after estrus), when progesterone levels have peaked.

During diestrus, the increased progesterone levels upregulate the secretory activity of the endometrial glands, promote proliferation of the endometrium, and induce cervical closure. At the same time, they downregulate myometrial contractility and the local leukocyte response. This local environment provides reduced uterine resistance to bacterial infection and an escalated risk of pyometra. It is hypothesized that these effects accumulate with each subsequent cycle.

In this environment, bacterial colonization is typically the cause of pyometra; however, some reports indicate that up to 20% to 25% of patients with pyometra do not grow any bacterial isolates on uterine culture at the time of diagnosis. Of those bacterial species isolated, *E. coli* is predominant in both canines and felines. Other bacterial isolates include *Staphylococcus Spp.*, *Streptococcus Spp.*, *Proteus Spp.*, *Klebsiella Spp.*, and *Pseudomonas Spp.* at far lower rates.



Prevalence and Clinical Presentation

Pyometra is the most prevalent reproductive disease in both dogs and cats. It is estimated that up to one in four intact female dogs are affected by pyometra, predominantly seen in middle-aged to older dogs. However, juvenile pyometras can and do occur at lower rates. Higher incidence rates in older dogs are thought to be associated with repeated estrous cycles, as stated above. Studies have shown varied and no conclusive evidence for a clear breed predisposition to pyometra.

The most common presenting clinical signs for dogs affected by pyometra include vaginal discharge, polyuria/polydipsia, lethargy/depression, abdominal discomfort/distension, anorexia, vomiting, diarrhea, and fever. In severe and advanced cases, patients can suffer from signs of sepsis and shock, including weakness/collapse, severe dehydration, pale mucous membranes, tachycardia, tachypnea, and weak peripheral pulses.

Diagnosis

Diagnosis is made by a combination of history, clinical signs, and abdominal imaging. Bloodwork can be beneficial in supporting a diagnosis of pyometra and, more importantly, assessing the patient's systemic health. Overall, Ultrasonography is the most helpful diagnostic tool for identifying pyometra. Often, distended fluid-filled loops of the uterus are visible on ultrasound adjacent to the urinary bladder. However, the differential diagnosis of mucometra and hydrometra has been noted to appear similarly on ultrasound. Strictly speaking, a definitive diagnosis of pyometra is made and verified through postoperative macroscopic and histologic examination of the uterus and ovaries, as well as microbiological examination of the uterine content.



Ultrasound Imaging of a confirmed case of canine pyometra. The Patient's Urinary Bladder (UB) is visible adjacent to distended loops of uterine horn in transverse section, indicated by an asterisk (*). Reddy et. al. *J. Andaman Sci. Assoc.* 29 (2):2024

Treatment and Prognosis

In cases of pyometra, ovariohysterectomy is strongly recommended as a definitive treatment. Although medical therapy for cases of open pyometra is sometimes considered in a young, systemically stable, and

healthy breeding animal, it will not be discussed in this article. In cases of pyometra, pre-operative evaluation and stabilization are paramount. Oftentimes, patients require correction of systemic consequences of pyometra mentioned above. Patients are often in need of intravenous fluid therapy, antibiotic therapy, antiemetic and anti-nausea medication, and pain medication. In general, a broad-spectrum antibiotic is started. A common first-choice medication at the time of diagnosis is Clavamox. Although an appropriate choice, a fluoroquinolone antibiotic, such as Enrofloxacin, should be considered if available, given the most common reported bacterial isolates and its broad spectrum of coverage against gram-negative bacteria. Subsequent antimicrobial choices should be guided by culture and sensitivity results.

Overall prognosis for cases of pyometra without the presence of uterine rupture is excellent, with one study reporting a survival rate of 97% in dogs treated surgically. Many studies suggest severe azotemia at the time of diagnosis as a negative prognostic indicator. Acute uterine rupture increases the overall mortality rate to approximately 50%, and sometimes higher, depending on the progression and timing of a subsequent septic abdomen.

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