



## Gangrene of the Tongue Develops 48 Hours Following Ovariohysterectomy as a Treatment of Open-Cervix Pyometra in a Bitch

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### ABSTRACT

This case report describes, for the first time, a simultaneous occurrence of open-cervix pyometra and gangrene of the tongue in a ten-year-old intact female Griffon dog. The bitch had a three-week history of grayish black thin purulent vulvar discharge, severe licking of the external genitalia, polyuria, polydipsia, inappetence and lethargy. The owner acknowledged of estrous cycle since two months. Blood work revealed severe leukocytosis, neutrophilia, monocytosis and elevated level of globulins. Urinalysis revealed low specific gravity of the urine. Abdominal radiography showed fluid-filled and slightly enlarged uterus. Ultrasonography of the abdomen revealed enlarged uterus with a thickened uterine wall. The diameter, wall thickness, and luminal thickness of the uterus were 2.32 cm, 0.38 cm, and 1.94 cm, respectively. Accumulation of anechoic-hypoechoic pus inside the uterus was also noticed. The case was confirmed as open-cervix pyometra therefore, ovariohysterectomy was carried out. After 48 hours post-operative, the bitch developed dry gangrene of the tongue. The cranial fourth of tongue became cold, insensitive, dry and grayish white. Moreover, there were diminished lingual function and a clear line of demarcation between the healthy and gangrenous parts of the tongue. Partial glossectomy was carried out and tolerated by the bitch. The animal had acceptable and functional outcomes. In conclusion, transmission of infection from open-cervix pyometra to the tongue is possible, leading to dry gangrene in dogs.

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### INTRODUCTION

Pyometra is a serious and life-threatening secondary infection in the uterus due to hormonal changes in female dogs that requires prompt treatment (Hagman, 2017). After estrus, level of progesterone increases for 4-8 weeks that stimulates thickening of the uterine lining in preparation for pregnancy. If no pregnancies occur for several estrus cycles, the uterine lining increases in thickness until cystic endometrial hyperplasia occurs. The thickened cystic lining secretes fluids that create an ideal environment for bacterial growth (Hagman, 2017; Hagman, 2018). Moreover, high level of progesterone inhibits contraction of the uterine muscles and expelling of the accumulated fluid or pus (Schlafer and Gifford, 2008; Hagman, 2022).

In addition, white blood cells (WBCs), normally protect against infection, are inhibited from entering the uterus during estrus to allow sperms to

safely enter the female's reproductive tract without damage by WBCs (Schlafer and Gifford, 2008). Other contributing factors are both estrogen- and progesterone-based drugs that are sometimes used for treatment of some disorders of the female's reproductive system (Papich, 2021).

Although pyometra is commonly recorded in old female dogs, it may occur in any sexually intact young to middle-aged female dogs. Pyometra often occurs two weeks to two months following the last estrus. Rough Collies, Rottweilers, Cavalier King Charles Spaniels, Golden Retrievers, Bernese Mountain Dogs, and English Cocker Spaniels are the commonly affected dog breeds (Egenvall *et al.*, 2001).

There are two types of pyometra in dogs, open-cervix pyometra and closed-cervix pyometra. Closed-cervix pyometra is usually associated with

more severe illness than that of open-cervix pyometra in dogs (Jitpean *et al.*, 2017). Therefore, the clinical signs depend upon the type of pyometra. In open-cervix pyometra, purulent vulvar discharge is usually present with or without fever, lethargy, anorexia, polyuria, polydipsia, and depression (Baithalu *et al.*, 2010; Jitpean *et al.*, 2017). In closed-cervix pyometra, many non-specific clinical signs are usually present such as abdominal distension, polydipsia, polyuria, anorexia, lethargy, depression, absence of vulvar discharge, and with or without vomiting or diarrhea (Mateus and Eilts, 2009; Jitpean *et al.*, 2017). Radiography and ultrasonography are usually helpful diagnostic modalities for pyometra in dogs (Mateus and Eilts, 2009; Younis *et al.*, 2014; Kumar and Rasool, 2023).

Ovariohysterectomy (OVH) is the ideal treatment of pyometra in dogs with fluid therapy before and after surgery and antibiotics course for 7-14 day after surgery (Hagman, 2017; Turkki *et al.*, 2023). Untreated pyometra may be fatal due to the toxic effects of bacteria and organs dysfunction. Also in untreated closed-cervix pyometra may lead to renal failure, uterine rupture, peritonitis and toxemia (Maddens *et al.*, 2011; Gasser *et al.*, 2020; Turkki *et al.*, 2023).

Gangrene occurs when a part of the body loses its blood supply. It may result from an injury, an infection, or an illness and it is dangerous and even potentially fatal. Gangrene must be treated immediately to avoid spreading. Gangrene of the tongue is extremely rare disorder and glossectomy is the treatment of choice (Dvorak *et al.*, 2004). To the author's knowledge, there is no report described the simultaneous occurrence of tongue gangrene and open-cervix pyometra in dogs. Therefore, this case report describes, for the first time, dry gangrene of the tongue as a rare complication of open-cervix pyometra in a ten-year-old intact female Griffon dog.

### OBSERVATIONS

A ten-year-old indoor intact female Griffon dog was admitted to the surgery clinic, at Faculty of Veterinary Medicine, Cairo University-Egypt, with a three-week history of purulent grayish black thin vulvar discharge, severe licking of the external genitalia, polyuria, polydipsia, inappetence and lethargy. The owner acknowledged of estrous cycle since two months.

The recorded vital parameters included rectal temperature, pulse and respiratory rates (TPR). The TPR were 39.8°C, 101beats/min and 45cycles/min, slight over the reference ranges (38.5-39.4°C, 65-90 beats/min and 15-30 cycles/min, respectively). Clinical observation of the dog revealed mildly distended abdomen, generalized tenderness with mild guarding and abdominal pain.

Complete blood count and serum biochemistry revealed severe leukocytosis, neutrophilia, monocytosis and elevation of globulins. Urinalysis revealed low specific gravity of the urine. Abdominal radiography showed fluid-filled slightly enlarged uterus. Ultrasonography revealed enlarged uterus with thickened uterine wall. The diameter, wall thickness, and luminal thickness of the uterus were 2.32 cm, 0.38 cm, and 1.94 cm, respectively. Accumulation of anechoic-hypoechoic pus inside the uterus was also noticed.

Based on the case history, clinical signs, laboratory findings, radiography and ultrasonography features; the condition was diagnosed as open-cervix pyometra. Therefore, ovariohysterectomy (OVH) was conducted as usual under general injectable anesthesia. Briefly, Atropine sulphate 0.1 mg/kg (Atropine sulphate 1%®, ADWIA, Egypt) and Xylazine HCl 1 mg/kg (Xylaject 2%®, ADWIA, Egypt) were administered subcutaneously and intramuscularly, respectively as premedications. Ketamine HCl (Ketamine hydrochloride®, Rotexmedica Co., Germany) was given intravenously at a dose of 5 mg/kg body weight to induce general anesthesia. General anesthesia was maintained by 2.5% Thiopental sodium (Thiopental sodium®; EIPICO, Egypt) given intravenously at a dose of 25 mg/kg body weight.

After 48 hours of OVH, the cranial fourth of tongue developed signs of dry gangrene. The gangrenous part of the tongue became cold, insensitive, dry and grayish white with diminished lingual function. A clear line of demarcation was also seen between the healthy and gangrenous parts of the tongue (Fig. 1).



**Fig. 1.** A ten-year-old female Griffon dog showing dry gangrene of the tongue following ovariohysterectomy. Notice the line of demarcation between the healthy and dry gangrenous tissues.

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Partial glossectomy in the same day under the same injectable general anesthesia was performed after fasting of the dog for 12 hours before surgery. A semicircular incision up to 1 cm caudal to the gangrenous tissue was performed in order to remove the gangrenous tissue. Suturing was done periodically to close the incision as gangrenous tissue was excised. Suturing was performed with simple interrupted pattern using polygactin 910 suture materials #2/0.

The bitch had an uneventful recovery from both surgeries and was discharged after three days of the second surgery. The bitch was given intramuscular injections of Cefotaxime sodium at a dose of 10 mg/kg and Diclofenac sodium at a dose of 1.1 mg/kg once daily for five days after the first surgery (**Abu-Seida, 2012**). A basket muzzle was used for prevention of oral damage during recovery. The animal was provided with milk and soap for 3 days then, soft food diet for another 3 days. The bitch was followed up for one year postoperatively. The bitch had acceptable and functional outcomes without recurrence or complications.

### **DISCUSSION**

Canine pyometra is a common reproductive disease of intact female dogs affecting nearly one fourth of all bitches under ten years old (**Baithalu et al., 2010**). Despite its clinical importance, the pathophysiology of canine pyometra remains poorly understood (**Xavier et al., 2022**). A recent study recorded transmissible pyometra caused by *Escherichia coli* in between two cohabitant bitches (**Xavier et al., 2022**).

In the present case, the simultaneous occurrence of pyometra and gangrene of the tongue in the same bitch suggested a hypothesis of hematogenous transmission of infection. Nevertheless, it is impossible to detect the source of tongue infection. Many previous studies have suggested that uterine contents may be a source of dissemination of pathogens to the environment, possibly contaminating other organs like the mouth, urinary tract and rectum or other animals (**Siqueira et al., 2009; Agostinho et al., 2014; Xavier et al., 2022**). **Steinman et al., (2020)** recorded wet gangrene in all 4 limbs following surgical repair of lower urinary tract rupture in a 2-week-old foal. They suggested an early episode of septicemia, perhaps related to the surgery, causing thrombi formation and leading to gangrene. The suggestion of the blood spread infection cannot rule out in the present case. In particular, the type of recorded gangrene here is the dry form that indicates arterial occlusion.

The recorded pyometra here was observed in a ten-year-old intact female dog. Similar findings were reported before (**Egenvall et al., 2001; Gasser et al.,**

**2020**). Moreover, the clinical signs reported here are similar to those reported by earlier authors (**Egenvall et al., 2001; Jitpean et al., 2017; Gasser et al., 2020; Mustapha et al., 2020**). The recorded polyuria and polydipsia in the present case could be attributed to the effect of bacterial toxins on the kidney's ability to retain fluid therefore, urine production increased, and the bitch drunk large amounts of water to compensate.

The recorded bitch here showed severe elevation of WBCs count and globulins. These findings resulted from stimulation of the immune system by the present infection. These findings are in agreement with the previous results (**Egenvall et al., 2001; Jitpean et al., 2017; Mustapha et al., 2020**). Moreover, the specific gravity of the urine was very low due to the toxic effects of the bacteria on the kidneys. Nevertheless, these changes are non-specific and may be occur in any animal with severe bacterial infection.

Ultrasonography revealed mild enlargement of the uterus. This is due to the bitch suffered from an open-cervix pyometra which expelled a large amount of purulent discharge from the uterus.

Regarding treatment of the case, OVH was a safe and efficient treatment for pyometra as mentioned before (**Hagman, 2017, 2018 and 2022**). In the same time, partial glossectomy was also safe and efficient treatment for the gangrene of tongue. Most dogs recover well and adapt well with up to 60% removal of their tongue (**Dvorak et al., 2004**). Therefore, no complications were reported in the present bitch up till one year of surgeries.

The main limitation of the present case report was the unavailability of bacterial cultures and histopathology examination to confirm the pathogenesis of the condition.

### **CONCLUSION**

This case report describes, for the first time, the possible transmission of infection from open-cervix pyometra to the tongue in a bitch, leading to dry gangrene.

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### **Conflict of interest**

The author declares that there is no conflict of interest regarding the publication of this article.

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