
SURGICAL MANAGEMENT OF UTERINE RUPTURE AND FOETAL MACERATION IN A QUEEN

Athulya Prakash¹, Rohith Krishnan.M¹ and Sajith Sam²

¹Veterinarians, ²Veterinary Surgeon, District Veterinary Centre Kollam

ABSTRACT

Secondary ectopic pregnancy due to uterine rupture is a rarely diagnosed condition in cats. Clinical signs develop once the foetal tissues cause mechanical obstruction or undergo degradation, leading to sepsis, as seen in maceration. A 5-year-old multiparous queen, three weeks post queening, was presented to the District Veterinary Centre, Kollam, with anorexia and weakness since two days. On general clinical examination, the animal appeared dull, with an elevated temperature, pale mucous membranes, and a non-painful abdominal mass. Haematology revealed anaemia and neutrophilia. On radiography scattered foetal skeleton and a bubble-like appearance of autolyzed tissue could be seen. Considering the history, clinical signs, and radiographic findings, the case was diagnosed as uterine rupture and foetal maceration. Laparotomy was done, removing scattered foetal skeletal parts, foetal adnexa, necrosed omental and falciform fat. Adhesions in the intestinal serosa and spleen could be seen. Rupture of the left uterine cornua

was noticed, and ovariohysterectomy was done. Postoperatively, antibiotics, fluids, and supplements were given. The animal recovered uneventfully, emphasizing that prompt diagnosis and surgical intervention were the key to the recovery of animal.

Keywords: Maceration, Queen, Uterine rupture, Foetal skeleton, Adhesions, Abdomen

INTRODUCTION

Foetal maceration refers to the septic disintegration of foetal tissues, leaving behind the skeletal components. This usually develops following the intrauterine death of the foetus, leading to bacterial activity and sepsis (Johnston et al., 2001). It may also progress to uterine rupture, causing leakage of necrotic material into the abdominal cavity and, in turn, peritonitis, adhesions, and multi-organ compromise (Verstegen et al., 2008).

Foetal maceration is widely reported in domestic animals. There are relatively fewer reports of foetal maceration in dogs and cats, owing to their ability to expel dead foetus (Feldman and Nelson, 1996). Cats

are more prone to maceration than dogs and can be seen associated with contraceptive use (Suresh *et al.*, 2023).

Foetal death and associated changes can also be seen as a complication of ectopic pregnancy. Ectopic pregnancy is a condition in which the foetus develops outside the uterus. It can be either tubal or abdominal. While tubal pregnancy has been reported in primates, abdominal ectopic pregnancy is the common one in cats. It can be classified as primary or secondary. In primary ectopic pregnancy, the fertilized ovum is transferred to the abdomen instead of the uterus. Secondary ectopic pregnancy occurs when a developed foetus is transferred to the abdomen due to internal or external factors, which include uterine rupture or the death of the foetus (Chong, 2007; Zheng *et al.*, 2018).

Uterine rupture is the most commonly reported cause of secondary ectopic pregnancy. It is typically associated with dystocia, retained foetuses, uterine inertia, trauma, uterine wall weakness in multiparous animals, obstetrical manipulations, contraceptive use, and oxytocin use (Fossum, 2013). Pregnant animals in the advanced stages are more prone to uterine rupture than early pregnant and non-pregnant ones (Davies *et al.*, 2016). Uterine rupture itself can be pre-parturient or peri-parturient. While

pre-parturient uterine rupture is mainly due to trauma, peri-parturient rupture is seen due to foetal death, infections, torsion of uterus, obstetrical intervention, and oxytocin use (Jackson, 2004; Noakes *et al.*, 2001). Common sequelae include intestinal compression, septic peritonitis, haemorrhage, foetal mummification and maceration (Noakes *et al.*, 2001). A rare case of uterine herniation as a cause for foetal death and associated resorption was reported by Becha *et al.* (2017).

Foetal maceration, uterine rupture and ectopic pregnancy as an incidental finding with nonspecific signs are seen in reports. This case report details the diagnosis and management of secondary ectopic pregnancy due to uterine rupture and foetal maceration in a queen.

CASE HISTORY & OBSERVATIONS

A 5-year-old female cat of parity four was presented to the District Veterinary Centre Kollam, with the complaint of anorexia and weakness since two days. The animal queened four kittens, three weeks back. Owner reported that no straining was noticed after queening of the last kitten. Animal was having normal defecation and stranguria. The animal was dull, depressed, and dehydrated with elevated temperature and pale mucous membranes. A non-painful, firm mass was palpated on the

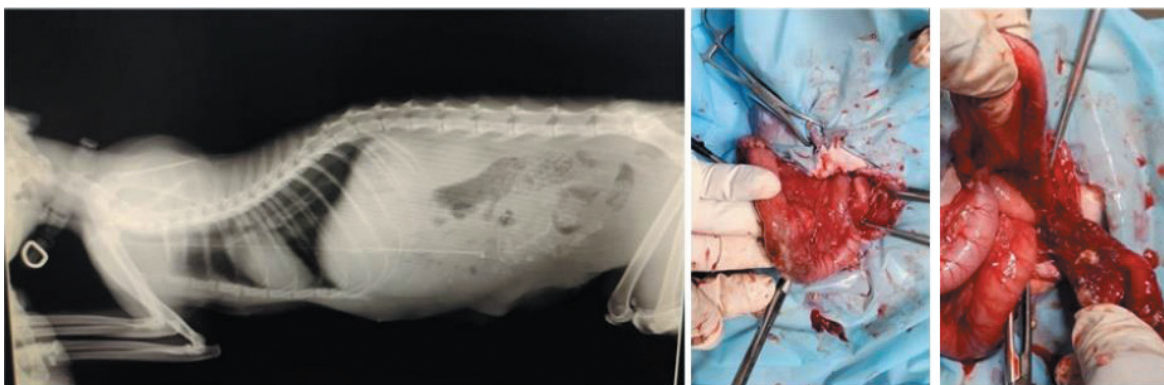


Fig 1. Scattered foetal skeleton and bubble like appearance around autolyzed tissue **Fig 2.** Adhesions in intestinal serosa **Fig 3.** Bladder necrosis



Fig 4. Necrosis of omentum, falciform ligament, falciform fat and adhesion to spleen **Fig 5 a.** Removed foetal skeletal parts, **b.** foetal adnexa, **c.** uterus and ovary, **d.** omentum and falciform fat

abdomen. Haematology revealed anemia and neutrophilia. Radiography revealed a scattered foetal skeleton, and a bubble-like appearance of autolyzed tissue was visible. Based on the history, clinical signs, haematology and radiography the condition was diagnosed as uterine rupture and foetal maceration.

TREATMENT AND DISCUSSION

As the case was protracted, leading to possibilities of adhesions, and since the foetal parts appeared to have undergone autolysis, ovariohysterectomy was chosen as the treatment option after discussion and consent of the owner.

Midventral laparotomy was done under ketamine (@5mg/kg) –xylazine (@1mg/kg) induction and propofol (10mg/kg) maintenance. Adhesions were noticed in the intestinal serosa and spleen. Necrosis of the intestinal serosa, bladder, omentum, falciform ligament, and falciform fat could be observed along with scattered foetal skeletal parts and adnexa. The scattered foetal skeletal parts, foetal adnexa, necrosed omental fat, and falciform fat were removed. On inspection of the uterine horns, rupture and necrosis of the left horn of the uterus were noticed. Ligation and dissection of both ovarian ends and the uterine end were done.

The abdominal cavity was lavaged with sterile normal saline twice, followed by two metronidazole flushes. Abdominal muscles and subcutaneous tissue were apposed continuously with Vicryl 2/0 and skin in a horizontal mattress pattern with Vicryl 2/0. Post operatively, Amoxicillin @12.5mg/kg, Enrofloxacin @ 5mg/kg, Ranitidine @ 0.2 mg/kg, Ringer's lactate @ 10ml/kg were given and advised to continue for 6 more days. Tab firocoxib @ 1mg/kg and sharkoferol were given. The animal was brought for review 10 days post-surgery. Improvement in terms of food intake, activity was reported by the owner.

In most reports of secondary ectopic pregnancy, a history of trauma, either due to vehicular accident, animal fight, or fall from height, can be seen (Lucas *et al.*, 2003; Jayakumar *et al.*, 2015; Davies *et al.*, 2016). The animal was multiparous in this case, as in similar reports. Complications of previous parturition, caesarean section, or ovariohysterectomy leading to disposition of foetus into abdomen and damage to uterine wall have been stated to contribute to the development of ectopic pregnancy (Kustritz, 2006).

The animal was presented with nonspecific signs like anorexia and weakness, clinical signs that have been noted in such cases. Commonly reported signs are anorexia, retching, vomiting,

and increased abdominal size (Rosset *et al.*, 2011; Chong, 2017; Suresh *et al.*, 2023). Foul-smelling uterine discharge and systemic illness are reported in cats undergoing maceration (Johnston *et al.*, 2001). The clinical signs generally develop either following mechanical interference of the ectopic foetus and abdominal organs or when sepsis develops following necrosis of the ectopic tissue (Rosset *et al.*, 2011).

No association was reported between the period during which the ectopic foetus is present in the abdominal cavity and the development of clinical signs (Rosset *et al.*, 2011). Time from previous queening to the presentation of the animal was three weeks in this case, while in reports of Suresh *et al.* (2023), the animal was presented in four weeks. Osenko and Tarello (2014) reported a diagnosis of ectopic pregnancy after seven years.

Abdominal ectopic foetus can be diagnosed by palpation, radiography, ultrasonography, computed tomography, or explorative laparotomy. Ultrasonography is the most preferred method, while computed tomography and magnetic resonance imaging can provide a more precise location of the foetus. Histopathology can further confirm the condition (Kose *et al.*, 2024).

A firm, non-painful mass was palpated on the caudal abdomen in this case;

similar observations were made by Davies *et al.* (2016) and Suresh *et al.* (2023). On radiography, mineralized foetal skeleton could be visualized, and gaseous distension around the autolyzed tissue could be seen, consistent with the report of Davies *et al.* (2016) and Suresh *et al.* (2023). In this case diagnosis was based on radiography and laparotomy findings.

A dead macerated foetus was seen in this case, consistent with the report of Suresh *et al.* (2023). Mummification of ectopic foetus was reported by Rosset *et al.* (2011). Live foetuses were removed from the abdomen only in cases presented within a few hours of trauma (Lucas *et al.*, 2003; Jayakumar *et al.*, 2015; Davies *et al.*, 2016). Uneventful recovery as reported in this case is validated by the reports of Rosset *et al.* (2011), Davies *et al.* (2016), and Suresh *et al.* (2023).

CONCLUSION

A five-year-old multiparous queen was presented with anorexia and weakness three weeks post-queening. Clinical examination revealed fever, pallor, and a non-painful abdominal mass. Haematology showed anaemia and neutrophilia. Radiography demonstrated scattered foetal skeletons with autolyzed tissue, suggestive of uterine rupture with foetal maceration. Laparotomy followed by ovariohysterectomy was

performed under general anaesthesia, during which foetal remnants and necrotic tissues were removed. The animal had an uneventful recovery post-surgery. Secondary ectopic pregnancy is a condition that is seen with atypical signs and sometimes as an incidental finding in cats. The time of development of clinical signs after a foetal death is variable. Hence, this condition is to be ruled out in cats post-queening, caesarean, or spaying. This case report highlights the successful diagnosis and surgical management of secondary ectopic pregnancy due to uterine rupture and foetal maceration in a queen.

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