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Feline extrauterine pregnancy with fetal mummification: A case report

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Abstract
A four-year-old female Persian cat was presented to the Department of Veterinary Gynaecology and Obstetrics, Veterinary College, Hebbal, Bengaluru, with a history of anestrus persisting for three years. Clinical examination revealed free-floating, hard masses in the abdominal region, accompanied by pollakiuria, though the cat maintained a normal appetite. Radiographic imaging identified two circular mineral-dense structures in the caudal abdomen, while trans abdominal ultrasonography confirmed the presence of mummified fetuses characterized by disorganized bone architecture, hyperechoic fetal masses, and absence of cardiac activity. These findings were conclusively verified through exploratory laparotomy.

Keywords: Extrauterine pregnancy, cat, mummified fetus, ultrasound, ketamine, xylazine

Introduction
Extrauterine pregnancy (EUP), also known as ectopic pregnancy, occurs when a fertilized ovum implants outside the uterus. It is typically classified based on the site of implantation, most commonly as abdominal or tubal pregnancies. In non-primate species, tubal pregnancies have not been documented, possibly due to biological mechanisms that prevent implantation within the uterine tube and/or the absence of maternal recognition of pregnancy at this site (Corpa *et al.,* 2006) [1]. Nevertheless, although rare, the available veterinary literature has reported abdominal pregnancies in cats and other domestic animals (Chong *et al.,* 2017) [2].
Abdominal pregnancies can be categorized into 2 forms: primary and secondary. Primary abdominal ectopic pregnancies occur when a fertilized oocyte is displaced into the abdominal cavity, instead of following its normal path through the fallopian tubes, resulting in the entire pregnancy developing outside the uterus, attaching to the peritoneum, omentum, liver, spleen, uterine surface, or fallopian tube (Rosset *et al.,* 2011)) [3]. One theory suggests that if a fertilized ovum is present during spay surgery, extensive manipulation during the procedure may facilitate its escape into the abdomen, leading to implantation (Kustritz *et al.,* 2006) [4]. The diagnosis of primary abdominal ectopic pregnancy requires histological confirmation of extrauterine placentation on an abdominal organ. However, to date, no reports have provided sufficient histological evidence to document this occurrence. Secondary EUP occurs when a fertilized oocyte develops into a fetus within the uterus but is later expelled into the abdominal cavity due to uterine wall rupture (Chong *et al.,* 2017) [2]. In this case, a pregnancy that initially forms within the uterus continues its development in an extrauterine environment (Nack, 2000) [5]. Scientific literature suggests that true primary extrauterine pregnancy (EUP) occurs primarily in primates, including humans, rodents, and lagomorphs, due to their discoid hemochorionic placenta, which facilitates ectopic fetal development (Dzięcioł *et al.,* 2012 and Corpa *et al.,* 2006) [6, 1].

Materials and Methods
A four-year-old, female Persian cat was presented to the Department of Veterinary Gynaecology and Obstetrics, Veterinary College, Bengaluru, with a complaint of anestrus

persisting for three years and frequent urination. The owner, who adopted the cat three years ago, had no clear history of spaying. Since then, the cat has neither given birth nor displayed any signs of the estrus cycle.

The physical examination and auscultation revealed no abnormalities, and the cat remained active. Upon palpation, a mass with a kidney-like consistency was detected in the caudal abdomen. The radiographic study aimed to identify the location and number of space-occupying lesions. Abdominal radiograph obtained from the left lateral view (Figure 1) revealed two radiodense structures positioned cranial to the bladder, which were characterized by circular shape, smooth and well-defined margins. Subsequently, ultrasound imaging at a frequency of 7.5 MHz revealed a mummified fetus with an irregular bone structure. Fetal head (Figure 2a) and vertebrae (Figure 2b) appeared as hyperechoic structures. No fetal cardiac activity or limb movements were detected. The gestational age of the fetus as estimated by the ultrasound was approximately 6 weeks.

Exploratory laparotomy was conducted under dissociative anesthesia using Ketamine at a dosage of 15 mg/kg and Xylazine at 1 mg/kg, following clinical examination and diagnostic investigations. Multiple masses were identified, loosely adhered to the omentum (Figure 3). Further, during abdominal exploration for ovariohysterectomy, the uterus and ovaries were unexpectedly absent, suggesting that the cat had been spayed before adoption. The gross anatomical appearance of the mass resembled a potato, characterized by a smooth surface and firm consistency. Careful dissection revealed a mummified fetus within one of the masses. Two distinct masses contained a total of three foetuses two within a single mass and one within another characterized by disorganized osseous structures (Figure 4). The fetuses were enclosed in a thin, translucent membrane that resembled placental tissue (Figure 5).

Fig 1: Abdominal radiograph depicting two radiodense structures

(A)

(B)

Fig 2: Ultrasound image depicting, a) Mummified fetal head (H) of fetal age of appx. 6 weeks and b) Fetal vertebrae (V)

Fig 3: Loosely attached masses to the omentum

Fig 4: Mummified fetuses dissected out from the mass

Fig 5: Separation of the placenta from the outer layer of the mass

Results and Discussion

According to Rosset *et al.* (2011) [3], primary extrauterine pregnancy (EUP) arises when a fertilized ovum implants outside the uterine environment, such as on the omentum, peritoneum, or within the fallopian tubes. In contrast, secondary EUP results from uterine wall rupture, typically due to trauma, allowing the fetus to develop ectopically within the peritoneal cavity. In this case, the clinical symptom of pollakiuria may be associated with the presence of a firm mass in the caudal abdomen that exerts pressure on the bladder, correlating with the cat's frequent urination. These findings are consistent with the observations of Osenko and Torello (2014) [7], who reported increased urination in animals presenting with abdominal tumors. The adopted cat had previously engaged in mating, resulting in pregnancy. A subsequent uterine rupture may have led to a secondary extrauterine gestation that remained undetected. Given the absence of a detailed pre-adoption history, it is reasonable to presume that the cat may have undergone ovariohysterectomy prior to adoption. As ectopic fetuses are defined by their abnormal location, macroscopic examination of the fetuses, along with an analysis of the patient's history, supports the diagnosis.

Distinguishing primary from secondary EUP remains challenging (Laube *et al.*, 1986[8] and Rosset *et al.*, 2011) [3], as secondary EUP, which is common in cats due to trauma-induced uterine rupture (Kumru *et al.*, 2007) [9], is often misclassified as primary in non-ovariohysterectomized individuals (Johnston *et al.*, 1983) [10]. Two primary explanations have been proposed for the occurrence of ectopic pregnancy in spayed animals. One theory suggests that physical manipulation of the fallopian tubes during an ovariohysterectomy, performed coincidentally after coitus, may displace fertilized ova into the abdominal cavity. Alternatively, the retrieved fetus may originate from a previously undetected primary or secondary pregnancy (Nack, 2000 and Corpa *et al.*, 2006) [5, 1].

Radiography serves as a valuable diagnostic modality in assessing ectopic pregnancy, as it enables visualization of fetal bone mineralization and facilitates estimation of the number of gestational sacs. Ultrasonography facilitates the detection of fetal heart rate and movement. Ectopic pregnancies are typically associated with fetal death. However, cases of primary abdominal pregnancy have been documented in domestic animals, fetoplacental development outside the uterine environment does not support viable gestation. In cats, this form of placentation is incompatible with the successful progression of extrauterine pregnancy (Corpa *et al.*, 2006) [1].

Conclusion

Extrauterine pregnancy is often an incidental finding because affected animals typically remain asymptomatic, maintain good health, and go undetected for months or even years. Advanced imaging modalities like radiography and ultrasound imaging are pivotal in establishing an accurate diagnosis, while surgical intervention remains the most effective therapeutic approach.

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Conflict of Interest

Not available

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Reference

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