



IJABBR- 2014- eISSN: 2322-4827

International Journal of Advanced Biological and Biomedical Research

Journal homepage: www.ijabbr.com



Original Article

Accidental Finding of Ectopic Pregnancy in a Cat with Presence of Three Fetuses without Gestational Sac that were Attached to the Abdominal Wall and Mesentery (A Case Report)

Pedram Mirsepehr¹, Iman Asheghian², Mostafa Hajinasrollah², Seyed Reza Javadi², Ali Reza Bashiri², Mohamad Reza Esmailinejad³, Hamid Taghipour*⁴, Seyed Mohamade Mojtahedzade⁴

¹Assistant Professor of Veterinary Surgery, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran

²Resident of Veterinary Surgery, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran

³Resident of Veterinary radiology, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran

⁴Doctor of Veterinary Medicine, student of Faculty Veterinary Medicine, University of Tehran, Tehran, Iran

ARTICLE INFO

Article history:

Received: 09 Apr, 2015

Revised: 27 May, 2015

Accepted: 27 Jun, 2015

ePublished: 30 Jul, 2015

Key words:

Ectopic pregnancy

Gestational sac

Fetus

Cat

ABSTRACT

Objective: A secondary ectopic pregnancy is defined as continuing development of a fetus in the abdominal cavity after rupture of the uterine wall, which may be associated with a history of trauma. **Methods:** A cat was referred to the veterinary teaching hospital of the University of Tehran with history of anorexia and vaginal bleeding. In clinical examination some masses were palpated in abdominal cavity so the patient was referred to radiology and sonography for definite diagnoses. In ultrasonography examination three dead fetuses were detected outside the uterus. In US it so appeared that gestational sacs did not cover the fetuses and there was a rupture in cranial part of right uterine horn that made the case highly suspected to ectopic pregnancy caused by trauma. **Results:** Therefore the cat was prepared for aseptic surgery and anesthetized with isoflurane. After incision of the linea alba three fetuses were seen outside the uterus that were attached to abdominal wall (left and right wall) and mesentery. There was no sign of gestational sac to cover the fetuses. The three fetuses were bluntly dissected from the attachments and all conspicuous vessels were ligated and the fetuses were removed. Ovariohysterectomy was also performed to prevent recurrence. Recovery was uneventful.

Introduction

Ectopic pregnancy is a pathology that consists of a pregnancy developing in a site different from the uterus. The causes and mechanisms leading to this pathology are not always clearly defined (Corpa, 2006). According to the definition of extrauterine pregnancy (EP) ectopic pregnancy is the state when the pregnancy develops outside of the uterine body (Corpa, 2006). Regarding

location, two types of extrauterine pregnancy could be recognized: abdominal and oviductal pregnancy. Additionally, this pathological condition may be classified as primary or secondary (Bouyer et al. 2002; Corpa, 2006; Kriebs and Fahey, 2006). The primary extrauterine pregnancy occurs as a result of the waves of the antiperistaltic oviductal contractions, or as a result of oviductal obstruction, a fertilized ovum could not be transferred to the uterus. It may then fall out into the

*Corresponding Author: Hamid Taghipour, Doctor of Veterinary Medicine, student of Faculty Veterinary Medicine, University of Tehran, Tehran, Iran (Hamid_taghipour@yahoo.com)

abdominal cavity and attach itself to the peritoneum, omentum, liver, spleen, or onto the outside part of the uterine tube, or the uterine body (Dzięcioł *et al.* 2008). Primary ectopic pregnancy is not usually diagnosed in animals. The only exception is rodents and lagomorphs. They have, same as humans, a discoid, hemochorionic placenta, and the occurrence of EP in these animals is relatively common. The type of placenta present in the rest of domestic animals probably makes it impossible to develop the primary extrauterine pregnancy. Segura *et al.* (Segura *et al.* 2004) in their studies on EP in rabbits described two cases of primary EP, in which the extrauterine placentation was detected. Moreover, Gosden and Russel (Gosden Russell, 1981) also reported a case of a spontaneous placentation found in the abdominal cavity of a rat. However Laube (Laube, 1986) who observed embryos in a cat's abdomen finally concluded that the primary abdominal pregnancy could not be proved on the histological examination. The oviductal pregnancy is most commonly seen in humans. In animals this type of ectopic pregnancy was only recorded in primate monkeys (Jerome and Hendrickx, 1982). The oviductal pregnancy is very unlikely to develop in domestic animals while the physiology of the uterine tube in domestic animals is different in comparison to the humans' (Corpa, 2006; De Cecco *et al.* 1984; Hunter, 1994; Hunter, 1998). The restricted fluid flow, from the uterine glands to the uterine tubes, may lead to the significant difficulties in creating the appropriate conditions for the development of an embryo (Corpa, 2006). Moore *et al.* (1992) stated that the rabbit's endosalpinx may produce a factor, which prevents the implantation within its area. Similar suggestions were published by Pauerstein *et al.* (1990) who proposed, that this kind of factor might be present in other animals too, and absent in women, which would explain the adverse clinical findings in humans and animals. In the case of secondary EP, initially, the fetus develops in the uterus, and then gets into the abdominal cavity, through the rupture of the uterine wall, caused usually by a trauma or injury (Mitchell, 1989). Of the case reports describing ectopic pregnancy in cats, none of them describes the presence of viable kittens outside of the uterus (Rosset *et al.* 2011). Instead, most report the occurrence of mummified or macerated fetuses in the abdominal cavity, with or without apparent supporting membranes, in some period of time after routine ovariohysterectomy or parturition (Dzięcioł *et al.* 2012). In most of the reported cases, females carrying fetuses in the abdominal cavity, showed no clinical symptoms and some of them even remain fertile. However, there are also several recorded cases of EP, with subsequent development of pyometra, or with various intensity of clinical symptoms (Botcherby, 1980; Corpa, 2006; De Nooy, 1979; Nack, 2000). Clinical symptoms include non-specific signs like vomiting, anorexia, depression, lethargy, hematuria, pollakiuria, and urination outside of the litter box (Johnston *et al.* 2013). Most ectopic fetuses

are aseptic, although affected cats may be symptomatic. The main reason for the occurrence of the cases of the extra uterine pregnancy in small animals seems to be the parturition associated with uterine rupture and abnormal uterine anatomy (Corpa, 2006) In the literature there were several reports describing the cases of extrauterine pregnancies in cats (Corpa, 2006; Laube, 1986; Nack, 2000; Rosset *et al.* 2011; Wozniak, 2009). Diagnosis is made by abdominal radiography or ultrasonography. Treatment is usually made by surgical removal of the fetal tissues and supporting structures. This report focuses on a case in the context of different possible consequences and probable factors affecting the development and final effects of this event.

Case History

A two year old domestic short-haired cat was referred to the veterinary teaching hospital of the University of Tehran in May 2015. The cat was under evaluation for a recent history of increased thirst, urination outside the litterbox, poor appetite and vaginal bleeding. Clinical examinations revealed several masses in abdominal cavity similar to full term fetuses.

Clinical Finding

For definitive pregnancy diagnosis and to check for probable fetuses the patient was referred for ultrasonography examination. In US 3 fetuses without heart rate and also significant decrease in gestational sac and without presence of any gas echogenicity were detected in the abdominal cavity (Fig. 2). It seemed that the uterine horn tissue didn't cover the gestational sacs of fetuses, also presence of fetuses in cranial part of abdominal cavity near the liver parenchyma was noticeable (Fig 1).



Figure 1:



Figure 2:

Treatment

Surgery was performed as treatment in veterinary teaching hospital of the University of Tehran in May 2015. Anesthesia was induced using 5.5mg/kg of Ketamine in combination with 0.28mg/kg of Diazepam. The patient was then intubated and anesthesia was maintained using 1% to 3% concentrations of Isoflorane. The cat was placed in dorsal recumbency and the skin was prepared for aseptic surgery. The skin and linea alba were incised separately. Three fetuses were discovered in the abdominal cavity developed outside of the uterus. One of the fetuses didn't have a gestational sac. The other two fetuses developed amniotic membranes but with adhesion to surrounding mesentery and relating abdominal wall, one was attached to the right and the other was attached to the left abdominal wall. A small necrotic area was present on the right uterine horn, adjacent to its proximal portion (Fig 3). The two fetuses, which were fully developed and covered in thin membranes (Fig. 4) were carefully bluntly dissected and removed and connections of fetuses with mesentery and abdominal wall were intercepted and ligated with PGA 3/0. Ovariohysterectomy was also performed to prevent recurrence. The linea alba and subcutaneous tissue and the skin were closed in separate layers. Recovery was uneventful in the mentioned cat.



Figure 3:



Figure 4:

Discussion

Primary and secondary ectopic pregnancies have been previously reported in cats (Oe-Haan et al. 1991; Hosgood, 1989; Palmer, 1989). The cause of ectopia of the fetuses may be related to injury or traumatic rupture of the uterus during pregnancy or to abnormal disposition of the ovum after its fertilization (Colhy, 1986).

The present occurrence probably represents a secondary ectopic pregnancy in which the fetuses dropped out of the uterus by means of a tear in the uterine wall. The fetuses escaped from uterus into abdominal cavity following uterine rupture and were not viable at the time of surgery due to inadequate blood supply (Hosgood, 1989). To determine the precise time and the origin of the uterine rupture in this case were impossible because the owner had given us insufficient history. However, taken into account of her suffering from inappetence and emesis immediately after parturition and of litter dimensions it could be suggested that the rupture must have occurred as a result of abdominal trauma at the time of parturition. In this case the direct, underlying reason for the rupture of the uterine wall might be explained by the trauma caused by the fall from considerable height. The main idea for this described case is the general state of the females after the uterine wall damage. In contrast to the first incident, in this case, followed by the time of good general state of the female after fall, significant deterioration of the general health was observed. Furthermore, quick improvement following antibiotic therapy, may suggest the significant influence of the bacterial infection in the progression of symptoms. The clearly visible signs of peritonitis found during exploratory laparotomy also indicated the role of infection in development of the observed clinical symptoms. The possibility of presence of bacteria in vagina and in the uterus of the healthy females was described by many authors (Clemetson and Ward, 1990; Janowski et al. 2006; Watts et al. 1996; Olfati et al. 2014). Despite the fact that the presence of bacteria in queens' uterus could be infrequent, it may be concluded that it was the most probable source of microorganism in this

case, and the underlying cause of peritonitis. Moreover, as a consequence, it might be the reason for contrasting course of clinical changes in a cat suffering from ectopic pregnancy caused by the uterine wall rupture.

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