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Obstetrical Emergencies in Domestic Cats

X. Sophia[1], C. Jayakumar[1], M.H. Hiron[1], R.S. Abhilash[1]

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ABSTRACT

The adaptability of kittens as indoor pets and the unique situation presented by Covid 19 pandemic led to a flourish in cat breeding and sales. This has led to an increased number of feline obstetric cases presented to veterinary clinical settings during the last two years. Dystocia in dogs is well referenced, but it has received less attention and documentation in cats. Hence, a retrospective study of obstetric emergencies in cats was made. This study reviewed the incidence, treatment and outcomes of 48 feline obstetric emergencies presented to University Veterinary Hospital, Mannuthy, Kerala during the calendar year 2021. The data was analysed and represented according to the presenting complaint, causes of dystocia as maternal or foetal, diagnostic modes, outcome to medical or surgical treatment adopted and exceptional reasons for obstetric emergencies in cats. Dystocia (n= 45), uterine torsion (n= 3), ectopic pregnancy (n= 2) and uterine prolapse (n= 1) were the obstetric emergencies recorded during this study. 75.56 per cent of feline dystocia were due to maternal factors and 24.44 per cent due to foetal factors and in three patients, uterine torsion was identified as the cause of dystocia. Medical management was successful in 45.71% and surgical management was adopted in 48.89% cases. Ovariohysterectomy was performed in cats identified with torsion of uterus, prolapsed uterus and ectopic pregnancies.

Key words: Cat, Dystocia, Ectopic pregnancy, Uterine prolapse, Uterine torsion.

The gestation length in cats varies from 61 to 72 days from the first day of mating with an average of 65 days (Kustritz *et al*., 1995) and it is not correlated with age of queen, parity, number of kittens per litter, mean weight of kittens born, weight gain during pregnancy or genetic background (Johnston *et al*., 2001). Most queens deliver kittens with ease over several hours and the average length of parturition recorded is 16 hrs with a range of 4-42 hrs (Root *et al.,* 1995). But there are reports of queens delivering live healthy kittens over 2-3 days. This is known as interrupted labour during which the queen will pause active stage two labour, then resume foetal expulsion without compromising foetal viability (Little, 2012). In contrast to this during dystocia, progression of the labour is disrupted and survivals of dam as well as kittens are jeopardized.

The incidence of dystocia in the cats is reviewed at 5.8 per cent and brachycephalic breeds like Persian cats are identified with a higher incidence. The reported incidence of maternal dystocia is 67.16% and foetal causes contribute to 21.9% (Gunn-More and Thrusfield, 1995). Primary uterine inertia is identified as the most common cause of feline dystocia and intervention is often confused with normal gestation that may prolong up to 71 days (Johnston *et al*., 2001). Uterine prolapse, uterine torsion, ectopic pregnancies are the other obstetric emergencies often reported in feline species. However, there is an inadequacy of studies regarding the incidence and outcome of these types of obstetric emergencies in cats. Hence, this retrospective study was carried out to analyse the causes, diagnostic modalities, foetal and maternal outcomes in queens presented with obstetric emergencies. This will benefit the veterinary practitioner to institute timely management of obstetric emergencies in cats for the safety of the dam and the foetuses.

Feline cases registered at the Obstetrics and Gynaecology ward of the University Veterinary Hospital, College of Veterinary and Animal Sciences, Mannuthy, Kerala Veterinary and Animal Sciences University from January 2021 to December 2021 were inspected for obstetric emergencies. A total of 283 feline cases were registered from which breeding advice, pregnancy diagnosis, pyometra, medical termination of pregnancy, routine ovariohysterctomy (OHE) and anoestrus cases were excluded. Obstetric emergencies (n= 48) considered for the current study included dystocia, prolonged delivery, Caesarean section, uterine prolapse, uterine torsion and ectopic pregnancies.

Criteria used for diagnosis of dystocia included abdominal contractions and persistent straining for more

[1]Department of Animal Reproduction, Gynaecology and Obstetrics, College of Veterinary and Animal Sciences, College of Veterinary and Animal Sciences, Kerala Veterinary and Animal Sciences University, Pookode-680 651, Kerala, India.

Corresponding Author: C. Jayakumar, Department of Animal Reproduction, Gynaecology and Obstetrics, College of Veterinary and Animal Sciences, College of Veterinary and Animal Sciences, Kerala Veterinary and Animal Sciences University, Pookode-680 651, Kerala, India. Email: jayakumarc@kvasu.ac.in

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than 30 minutes without foetal expulsion, interval of more than 4 h between the expulsion of kittens, no progress of labour after 2 hrs of initiation of lochial discharge and peripartum maternal illness. Cats with the above clinical status were admitted to the feline obstetric ward and radiographic imaging of the abdomen was done to determine the foetal number, size, malpresentations, foeto-pelvic disproportions and obstructions of the birth canal. Trans-abdominal sonographic evaluation was done to determine foetal age based on biparietal diameter and foetal viability. Foetal heart rate <160 bpm was considered an indication for emergency intervention (Smith, 2012).

Digital manipulation and delivery following vaginal lubrication was practiced in dams with foetuses presented partially in the birth canal. In cats diagnosed with non-obstructing dystocia, medical management was initiated. Oxytocin, 1 IU was administered intramuscularly followed by intravenous administration of 0.5 ml of calcium gluconate (10%). Failure to expel the foetuses even after two courses of medical management at 30 min. interval was followed by emergency Caesarean section (CS). Pre-anaesthetic administration of glycopyrrolate and butorphanol followed by mask induction of isoflurane was used for surgical anaesthesia. Mid ventral laparotomy followed by milking out of fetuses through an incision on the dorsum of the uterine body was performed. After removal of kittens, uterine incision was closed in Utrecht pattern followed by closure of laparotomy wounds under standard surgical conditions. Post- operatively, all the cats were administered with antibiotic, analgesic and fluid therapy for 5 days. The sutures were removed on day 10 post-operatively.

A total of 283 queen cats were presented to Gynaecology and Obstetrics unit during the study period of one year, of which 62 cases were identified with obstetric emergencies. Fourteen cases were excluded because they were either aborting queens (n= 4), in normal stage one labour (n= 2) or post-parturient (n= 8). Cases considered for analysis included a total of 48 cats of which 45 were dystocic, one suffered prolapse of uterus and 2 had ectopic pregnancies. The mean age of the obstetric population of queens was 1.8 years and represented breeds that included domestic non-descript cats (n= 27) and Persians (n= 21). Thirteen cats were primiparous, 19 were multiparous while the parity status was unknown for 16 queens. Breeding was planned for 19 cats and for the remaining queens, it was unplanned.

Presenting complaints about the obstetric population of queens were visible abdominal contractions, lochial discharge, kittens presented in the vulva, prolonged interval between expulsion of kittens and restlessness exhibited by queens during peripartum period. The cause of dystocia in 75.56 per cent of cases (34/45) could be attributed to maternal including uterine inertia (n=28), uterine torsion (n=3) and constrictions of the birth canal (n=3). Dystocia due to foetal factors were identified in 11 cases (24.44%) including foetal oversize (n=4), malpresentation of the foetus (n=6) and dead emphysematous foetus (n=1). Observations of the present study agreed with the reports of Ekstrand and Forsberg (1994) that, maternal origin of dystocia was predominant in cats and fetal origin were fewer. According to this study uterine inertia (62.22%) was the major cause of dystocia and this corroborated with the previous report of Jutkowitz (2005), who specified uterine inertia as the predominant maternal cause in dystocic cats.

Vaginal lubrication followed by digital manipulation without medical management was successful in relieving dystocia in 7 cats and medical management was attempted in 35 cases (Table 1). Eleven cats failed completely to respond to medical management, while the response was partial in 8 cats. Total success rate to medical management of dystocia in cats under study was 45.71% which was higher than the previous reports of 31% by Gunn-Moore and Thrusfield (1995). Nineteen cats underwent surgery after medical management due to complete or partial failure to medical management. Three cats underwent direct CS without medical management owing to foetal distress (n=2) and pelvic fracture of the dam (n=1). The total number of cats which received surgical treatment was 48.89% (22/45) which was lower compared to other studies that reported surgical intervention of 75.0% (Gunn-Moore and Thrusfield, 1995) and 79.4% (Ekstrand and Forsberg, 1994).

A total of 153 kittens were born to all the 45 cats under report with dystocia, of which 83 (54.25%) were born before the presentation of the dam to the obstetric ward. Out of the 70 kittens born after dystocia management, nine kittens (12.86%) were delivered through digital manipulation, 27 kittens (38.57%) delivered after medical management and 34 kittens (48.57%) delivered through surgical intervention (Table 2). Total stillbirth observed was 49 (32.02%) of which 16 were kittens delivered through medical management, six kittens delivered through digital manipulation and 27 were from CS deliveries. Since queens with litter were discharged after treatment on the same day, the neonatal survival rate was not available for this study. According to Fournier (2017), stillbirth rate in general population of cats was 8.5% and in dystocic deliveries, the rate was 26.0% (Bailin, 2021), which approximately corresponds to a stillbirth of 32.0% in thisstudy. However, a high stillbirth rate (61.76%) in CS deliveries could be justified by a delayed presentation of the dystocia, uncertainty on culmination of delivery as well as from uterine torsions that compromised foetal viability.

Table 1: Management methods attempted for feline dystocia cases (n= 45).

Digital manipulation alone	7
Medical management attempted	35
All foetuses delivered with medical management	16
Complete failure to medical management	11
Partial response to medical management	8
Surgery after medical management	18
Surgical management alone	3
Total number of CS	21

Uterine torsion was identified as the cause of dystocia in three cats and it was confirmed by abdominal sonography in one cat. In the other two cats with complaint of prolonged parturition and non-responsive to medical management, uterine torsion was confirmed on laparotomy. The degree of torsion was 1080° involving the uterine body in one cat (Fig 1) and for the other two cats, 360° torsion of the left uterine horn was observed. Two of these cats underwent ovariohysterectomy as the uterus appeared cyanotic and devitalized and a partial hysterectomy was performed in one cat as torsion was limited to only a segment of the left uterine horn. Proposed contributing factors for uterine torsion include excessive foetal movement, uterine contraction, rough handling during pregnancy, lack of tone in the pregnant uterus, lack of foetal fluids and previous stretching of the broad ligament in multiparous individuals (Biller and Haibel, 1987). Presumptive diagnosis of uterine torsion is generally difficult and, in most cases, cats were presented with signs of dystocia and diagnosis made during explorative laparotomy. Due to the high frequency of vascular compromise and tissue devitalization, OHE is recommended for a better prognosis in feline uterine torsion cases (Freeman, 1988). OHE was carried out in two of the cats diagnosed with uterine torsion in the present study. A partial hysterectomy was performed in one cat as torsion was limited to a segment of the left uterine horn. Authors had performed the same procedure previously in a rabbit identified with uterine torsion limited to a single horn and four months later to surgery the animal conceived and had a normal delivery (unpublished data).

Uterine rupture and ectopic pregnancies in two feline patients were accidental findings of this study. One of the cats was presented with a complaint of dystocia and emergency laparotomy revealed single horn pregnancy. The other horn found ruptured and adhered with omentum entangling foetal bones of a previous pregnancy. Another

Table 2: Neonatal (n= 153) outcome of different methods of dystocia management.

	Still born	Live born	Total
Delivered prior to hospital admission	16	67	83
Born through Veterinary Assistance	49	21	70
Born through digital manipulation	6 (12.24%)	3 (14.28%)	9 (12.86%)
Born through medical management	16 (32.65%)	11 (52.38%)	27 (38.57%)
Born through surgical intervention	27 (55.1%)	7 (33.33%)	34 (48.57%)

(Figures in parentheses indicate per cent of assisted birth).



Fig 1: Torsion of uterus of 1080$^{0.}$

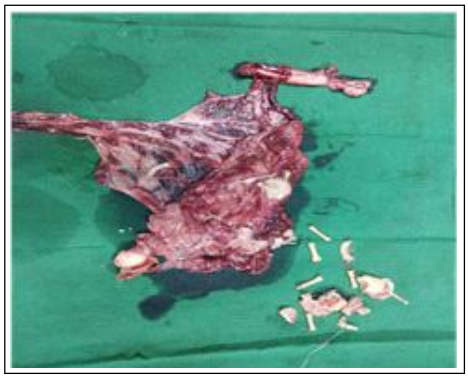


Fig 3: Ruptured uterus- foetal bones in abdomen.



Fig 2: Abdominal radiograph-Ectopic pregnancy.



Fig 4: Post-partum uterine prolapse.

queen was presented three months after mating for general examination. On abdominal palpation crepitation was evident and radiography (Fig 2) revealed foetal bony parts in the abdomen. Explorative laparotomy revealed a ruptured uterus and denuded foetal bones entangled with omental mesentery and abdominal viscera (Fig 3). In both the cats, ovariohysterectomy was performed. The presence of mummified foetuses outside the uterus has been reported in queens. These have been classified as primary if there was no evidence of uterine rupture and secondary, if uterine rupture could be identified (Johnston *et al*., 2001). In the current study, both the cases of ectopic pregnancy were identified as secondary due to ruptured uterus. The foetal bones denuded of tissues were attached to the omental mesentery and abdominal viscera in both cats. Clinical signs of illness are usually absent in queens with extra uterine mummified foetuses (Crownover and Yergen, 1976) and it was factual in this study also as the condition was determined on laparotomy procedure for management of dystocia.

A non-descript queen cat was presented with the complaint of postpartum uterine prolapse (Fig 4) and the interval between the expulsion of foetus and occurrence of prolapse was not clear as she was rescued from the street. Surgical management of correction was resorted in this cat with laparotomy and repositioning of uterus by vaginal manipulation and traction from inside through the laparotomy incision. Following reposition, OHE was performed owing to gross damage in the uterus. Uterine prolapse is relatively an uncommon obstetric emergency reported in cats and it was identified as the cause of maternal dystocia in 0.6% of cases (Ekstrand and Forsberg, 1994). The treatment for uterine prolapse depends on the severity of damage to the uterus and included ovariohysterectomy if further breeding was not desirable. OHE could be performed before or after reduction depending on the degree of contamination of the prolapsed uterus (Johnston *et al*, 2001) and in the mentioned case OHE was performed after reduction of the prolapsed uterus.

CONCLUSION

Compared to canines, documentation of obstetric emergencies is limited in feline species. This paper presents a retrospective analysis of 48 cases of obstetric emergencies in domestic cats, which is anticipated to broaden the understanding on the relatively unscripted sphere. Obstetric emergencies including uterine prolapse, ectopic pregnancies and uterine torsion require further documentation on incidence rate, etiologies and treatment outcomes with a large study population. Such documentations in felines will aid in accurate diagnosis, identification and management of obstetric emergencies which might help to reduce the overall fatalities for the dam and the fetuses.

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Conflict of interest

All authors declare that they have no conflict of interest.

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