

Caesarean section followed by ovariohysterectomy in a Bangladeshi domestic cat: A surgical intervention for management of dystocia due to partial primary uterine inertia

Anup K. Talukder¹  | Ziban C. Das¹ | Mohammad A. Rahman² |
 Mohammad T. Rahman² | Abu N. M. A. Rahman¹

¹Department of Gynecology, Obstetrics & Reproductive Health, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Gazipur, Bangladesh

²Department of Surgery & Radiology, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Gazipur, Bangladesh

Correspondence

Anup K. Talukder, PhD, Associate Professor, Department of Gynecology, Obstetrics & Reproductive Health, Faculty of Veterinary Medicine & Animal Science, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Gazipur-1706, Bangladesh.
 Email: anupbau@bsmrau.edu.bd

Abstract

Background: The incidence of dystocia in cats is relatively low compared to that in other pet and farm animals. However, when dystocia occurs in cats, manual, medicinal or surgical intervention is required.

Objectives: Here, we report a caesarean section (C-section) in a Bangladeshi domestic cat that suffered from dystocia due to partial primary uterine inertia.

Methods: A Bangladeshi domestic queen cat was presented to the Veterinary Teaching Hospital (VTH) with signs of dystocia. The queen had given birth to one kitten 36 hr earlier; however, newborn died 30 min after birth. She was unable to deliver the remaining fetuses. The cat had gone off feed, appeared depressed, had a severely enlarged abdomen and showed no straining efforts. On palpation, bony-like structures were felt in both sides of the abdomen. Ultrasonographic (USG) examination was carried out, which confirmed the presence of two fetuses, one fetus in each uterine horn. No fetal movements could be detected. The cat was diagnosed with dystocia due to partial primary uterine inertia.

Results: A C-section was performed, and two emphysematous, putrefied and large dead kittens were removed. The uterus was found to be severely decomposed and foul smelling; therefore, an ovariohysterectomy was carried out to prevent development of maternal toxemia and septicaemia. The queen recovered fully.

Conclusion: To the best of our knowledge, we report here, for the first time, a successful C-section followed by an ovariohysterectomy in a Bangladeshi domestic cat, suffering from severe dystocia due to partial primary uterine inertia for >36 hr.

KEYWORDS

Bangladeshi domestic cat, caesarean section, dystocia, ovariohysterectomy, uterine inertia

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1 | INTRODUCTION

Parturition is a normal physiological process that usually occurs without any assistance. Dystocia, also known as difficult parturition, is a state in which the dam is unable to expel the fetus without manual assistance and/or medicinal or surgical interventions (Sahoo et al., 2018). Unlike large domestic mammals, the incidence of dystocia is fortunately quite low in cats, even lower than that in dogs (Jackson, 2004). Only a few studies have been carried out on the incidence and management of dystocia in cats (*Felis catus*). Dystocia occurs in approximately 3.3%–5.8% of parturitions in queens (Gunn-Moore & Thrusfield, 1995; Humphreys, 1974; Pretzer, 2008) and is an important cause of stillbirth (Gunn-Moore & Thrusfield, 1995). Its incidence is slightly higher in Persian cats and lower in Norwegian forest cats than in other breeds (Ekstrand & Linde-Forsberg, 1994). To the best of our knowledge, there have been no reports on dystocia and its management in Bangladeshi domestic cats. Dystocia in the cat may be caused by fetal or maternal factors or, in some cases, a combination of both (Stedile et al., 2011). Altogether, 67.1% of cases have been attributed to maternal factors, and 29.7% to fetal factors (Ekstrand & Linde-Forsberg, 1994; Jackson, 2004). The fetal causes of dystocia include fetal oversize, malformation, malposition and abnormal posture. The maternal causes of dystocia mainly include abnormal force of contractions (abdominal and uterine) and incomplete dilatation of birth canal (narrow pelvis, uterine torsion, cervical/vaginal tumour, abscess, cyst and fibrosis etc.). Uterine inertia is a condition of weak or lack of the uterine contractions during parturition (Raut et al., 2009), which is reported to be the most common cause of maternal dystocia, amounting to 60.6% of cases reported in cats (Jackson, 2004; Oliveira, 2016). Uterine inertia might be associated with anatomical abnormalities of the birth canal, abnormal levels of hormones (especially oxytocin) or electrolyte imbalance (especially low plasma calcium) (Sahoo et al., 2018). This condition is classified as primary or secondary uterine inertia (Gendler et al., 2007; Van Den Weijden & Taverne, 1994). The primary uterine inertia is again subdivided into two groups: complete and partial primary uterine inertia. Complete primary uterine inertia occurs when the second stage of labor completely fails to start, resulting in failure of any fetal expulsion. Partial primary uterine inertia occurs when there is normal delivery of a litter, but the uterus becomes fatigued before delivery of all the fetuses (Jackson, 2004; Jones & Joshua, 1982; Pretzer, 2008). Primary uterine inertia is more common in multiparous species (dogs and cats) in comparison to that in uniparous animal species (Kutzler, 2009), and its incidence is also higher in primiparous animals than that in pluriparous (Kumar et al., 2018). On the other hand, secondary uterine inertia is a consequence of another cause of dystocia, such as fetopelvic disproportion, in which the uterine contraction ceases due to exhaustion after a period of non-productive labour (Jackson, 2004). Depending on the type of uterine inertia, timely and appropriate interventions, either medicinal or surgical, are required for survival of the dam and fetus as well. When medicinal treatment fails or is not possible, an immediate surgical intervention is required (Jyothi & Rajesh, 2018; Sahoo et al., 2018;



FIGURE 1 A Bangladeshi domestic cat, presented to the veterinary teaching hospital, with signs of dystocia for >36 hr

Traas, 2008). Here, we report the surgical management of dystocia due to partial primary uterine inertia in a Bangladeshi domestic cat.

2 | CASE REPORT

2.1 | Case details

A 2.5-year-old Bangladeshi domestic queen cat (Figure 1), weighing 3.95 kg body weight, was presented to the veterinary teaching hospital on February 16, 2020 with signs of dystocia. The cat was mated naturally and completed full gestational length of 65 days according to the information provided by the cat owner. The cat showed signs of onset of parturition such as restlessness, anorexia and panting, etc., approximately 2–3 hr before delivery of the first kitten. The queen had given birth to one kitten 36 hr ago, but the newborn died 30 min postpartum. The queen was unable to deliver the remaining fetuses. Before being presented to the hospital, the queen was treated with an ecbolic preparation, cloprostenol sodium (Dinorin®, Health Pharma Ltd.) and with a steroid preparation, dexamethasone (Steron-vet®, Acme Laboratories Ltd.), but these treatments did not work to deliver the remaining fetuses. The cat was anorectic and depressed; her abdomen was extremely large and she showed no effort to strain.

2.2 | Case diagnosis

During abdominal palpation, bony-like structures were felt in both left and right sides. No fetal heartbeat was detected by auscultation. USG examination was performed, which confirmed the presence of one fetus in each uterine horn, without any fetal movement. The case was diagnosed as dystocia due to partial primary uterine inertia. In this condition, the uterus is capable of bringing the first fetus to the pelvic inlet, from where it is delivered by abdominal straining (Jackson, 2004) and then the remaining fetuses cannot be delivered due to exhaustion of uterine muscles (Barolia et al., 2010; Jones &

Joshua, 1982; Pretzer, 2008), while the uterus loses its contractility (Parmar et al., 2017).

2.3 | Surgical procedure

First, the queen was injected with a pre-anaesthetic agent, atropine sulfate (Atropine®, Chemist Laboratories Ltd.) @ 0.06 mg/kg body weight intramuscularly (IM). After 10 min, general anaesthesia (GA) was induced by injection of ketamine hydrochloride (Ketaride®, Incepta Pharmaceuticals Ltd.) @ 20 mg/kg body weight IM. Anaesthesia was achieved in 15 min. The cat was transferred to the operation table and all limbs were secured using ropes made of surgical gauze. The tongue was pulled out to the side using tongue forceps and the mouth was closed.

The operative site, the abdomen caudal to the umbilicus (Figure 2a), was clipped, shaved, disinfected with povidone iodine (Povisep®, Jayson Pharmaceuticals Ltd.) and draped with surgical cloth. A 5–6 cm long incision was made on the ventral abdominal midline, 1 cm caudal to the umbilicus. Skin, subcutaneous tissue, linea alba, and peritoneum were sequentially incised. Then, the uterus was identified and exteriorized through the incision. A longitudinal incision was made on the greater curvature of the uterus close to the bifurcation of the uterine horns, avoiding large blood vessels and the placental belt. The fetus in the left horn was removed first (Figure 2b). The umbilical cord was ligated and transected. The remaining fetus in the right horn was removed in the same manner. The uterus was found to be severely infected, and partially necrotic, with putrefaction; consequently, ovariohysterectomy was initiated. Briefly, the left ovary was grasped with artery forceps and distal blood vessels were ligated. The same procedure was followed for the right ovary. Then, the uterine vessels running along each side

were ligated. An artery forceps was placed in the uterine body. A secure ligature using chromic catgut 2-0 was applied around the cervix (Figure 2c). The ovaries and uterus were freed from other structures, including the mesovarium and mesometrium, by cutting with a sterile scissor and crushing with a sterile artery forceps. The uterus was transected 1 cm cranial to the ligature around the cervix. Crushing was done to prevent haemorrhage. Before closing the abdominal wound, we checked carefully for the presence of any haemorrhage. The peritoneum, muscle and subcutaneous tissue were closed using simple continuous suture with cat-gut 1-0 (Figure 2d), and the skin was closed by applying horizontal mattress sutures with silk thread (Figure 2e).

2.4 | Post-operative care

As post-operative care, the queen was given 40 ml 5% dextrose saline (Libbot®, Libra Infusions Ltd.) intravenously immediately after surgery. She was also treated with a broad-spectrum antibiotic, ceftriaxone (Ceftron-Vet®, Square Pharmaceuticals Ltd.) @ 50 mg/kg bodyweight IM at 12 hr intervals for 7 days, and with a pain killer, ketoprofen (Keto-A Vet®, Acme Laboratories Ltd.) @ 3 mg/kg body weight, IM once daily for five days. In addition, 100 mg Vitamin-C (Syp. Ascason®, Jayson Pharmaceuticals Ltd.) was administered orally once daily for 10 days. External skin sutures were removed after complete healing.

3 | RESULTS AND DISCUSSION

In the present case, two dead fetuses along with their placentas (Figure 3a) were removed by C-section in a Bangladeshi domestic

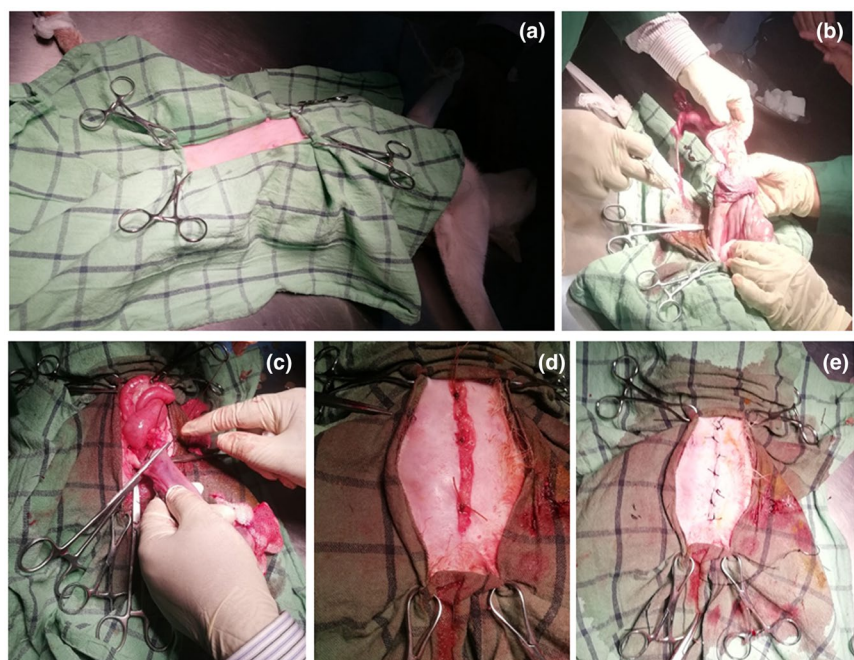


FIGURE 2 Different steps of C-section and hysterectomy in cat. (a) Operative site with surgical drape, (b) Removal of a kitten from uterus, (c) Ligating of cervix for hysterectomy, (d) Sutured abdominal wound after C-section and hysterectomy, and (e) External suture in skin

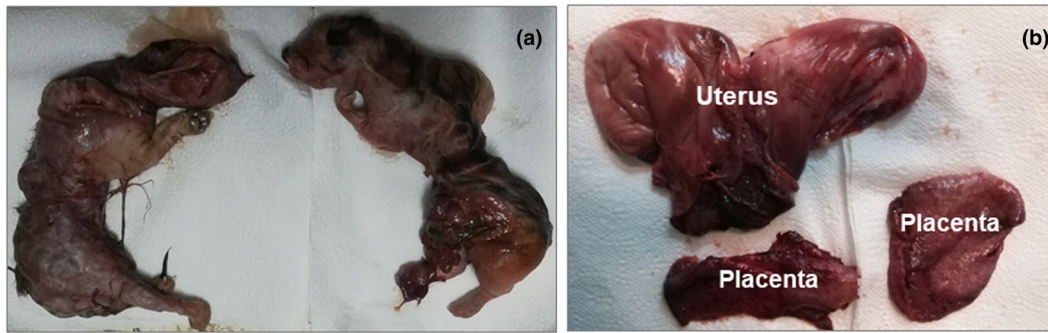


FIGURE 3 (a) Two large and emphysematous dead kittens after removal by C-section, and (b) The uterus and placental part after hysterectomy

cat. By 10 days after the C-section and ovariohysterectomy, the cat returned to all normal activities, including eating, drinking, playing, urinating, and defecating.

The incidence of dystocia is fortunately very low in the queen cat (Jackson, 2004). However, when dystocia occurs, there are two forms of treatment: medicinal and surgical management (Pretzer, 2008; Traas, 2008). The drug of choice for treatment of the uterine inertia is oxytocin alone or supplemented with calcium borogluconate and glucose solution in cats (Jackson, 2004). Surprisingly, in the present case, the queen was previously treated with cloprostenol before the patient was placed in our hospital. The treatment of uterine inertia with cloprostenol is very uncommon, which might aggravate the situation of the queen.

It should be noted that physiological prolongation of parturition lengths up to 48 hr has been reported in cats (Jutkowitz, 2005; Sparkes et al., 2006). In our case, the queen was unable to deliver remaining two fetuses after delivery of the first kitten >36 hr previously. The cat did not show any straining effort, failed to respond to medicinal therapy and became exhausted, when she was admitted to our hospital. In addition, there was no fetal movement detected on examination. Moreover, a foul smelling vaginal discharge, dullness, depression and anorexia suggested for development of maternal toxemia. This condition might be the result of an exhausted uterus (Barolia et al., 2010), which lacked the ability to produce contractions for delivery of the remaining fetuses. All these factors led us to perform an immediate C-section for delivery of the remaining fetuses and to save the life of dam.

A C-section is a major surgery, in which the fetus is delivered through incision of the abdomen and uterus (laparohysterotomy). The outcome of a C-section mainly depends on the physical condition of the dam and how long she has been suffering from dystocia. In our study, C-section was performed after 36 hr of dystocia, but it was used successfully to remove two dead fetuses that save the dam's life. The dead fetuses looked relatively larger in size due to accumulation of gas in the subcutaneous tissue (emphysematous condition), which might also be associated with bacterial infections. During the operation, a foul smell from the uterus and the uterine colour strongly indicated severe uterine infection. Thus, the uterus

was removed (Figure 3b), along with two ovaries to prevent development of toxemia and septicaemia.

In conclusion, we successfully carried out a C-section followed by ovariohysterectomy for the first time in a Bangladeshi domestic cat suffering from severe dystocia due to partial primary uterine inertia for >36 hr. This C-section enabled delivery of two dead kittens and thereby saved the life of the dam.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest with regard to the publication of this manuscript.

AUTHOR CONTRIBUTION

Anup Kumar Talukder: Conceptualization; Investigation; Methodology; Supervision; Validation; Visualization; Writing-original draft. **Ziban Chandra Das:** Conceptualization; Investigation; Methodology; Writing-review & editing. **Mohammad Ataur Rahman:** Investigation; Methodology; Writing-review & editing. **Mohammad Tuhinur Rahman:** Investigation; Methodology. **Abu Nasar Mohammad Aminoor Rahman:** Investigation; Writing-review & editing.

ORCID

Anup K. Talukder  <https://orcid.org/0000-0001-6904-8801>

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