



Transvaginal uterine evisceration during labor in a Bengal queen

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Abstract

Case summary A 2.5-year-old Bengal queen was admitted with a 12-h history of a mass protruding from the vulva during labor. At that time, three healthy kittens had already been delivered. Physical examination identified the mass as a portion of the uterus that was eviscerated without eversion of the mucosa. Exploratory laparotomy revealed a vaginal vault rupture with a large portion of the uterus herniated through the tear and eviscerated through the vulva. Ovariohysterectomy was performed, and a dead fetus was removed with the uterus. Reconstruction of the vaginal rupture required careful dissection and urethral catheterization. The queen recovered without complications.

Relevance and novel information Uterine evisceration through a vaginal tear is a very rare condition that sometimes is erroneously referred to as 'prolapse'. Uterine prolapse and uterine evisceration may have similar presenting signs; however, proper identification and surgical correction is key when the uterus is eviscerated. This case highlights the importance of differentiating these two conditions and of rapid identification and surgical intervention for successful patient survival.

Keywords: Vaginal rupture; uterine evisceration; dystocia; queen

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Introduction

Several conditions, including infectious, metabolic or traumatic, have been described during the peripartum period in domestic animals. Although rare in domestic cats, the most commonly reported are vaginal and uterine prolapse,^{1–4} which can occur at any time during labor and up to 48 h after delivery. A queen with a prolapsed uterus will present with one or two tubular masses protruding from the vulva, and diagnosis is confirmed by inspection of the prolapsed organ. Another even rarer condition is uterine evisceration, in which the uterus is not prolapsed, but eviscerated through a vaginal tear. To our knowledge, only one case of uterine evisceration in a queen is described in the literature.⁵ Rupture of the vaginal wall with evisceration of different organs (including, but not exclusively, the uterus) has been described in women,^{6,7} and similar cases are reported in ewes⁸ and dogs (intestines, bladder and uterus).^{9–12}

Both uterine prolapse and uterine evisceration may have similar presenting signs and only a careful inspection of the prolapsed/eviscerated organ allows for an accurate diagnosis. These are two different clinical conditions in

which the treatment and prognosis vary; however, in the literature both are sometimes erroneously referred to as 'prolapse'. This is the report of a rare complicated case of a complete vaginal tear with uterine evisceration through the vulva in a Bengal queen during labor.

Case description

A 2.5-year-old (3.5 kg) female intact Bengal queen was referred for a possible uterine prolapse during parturition, which had started approximately 12 h before presentation. The owner found the cat after it had delivered three healthy kittens, hiding and showing aggressive behavior. Upon examination, they noticed a mass protruding from the vulva that was thought to be another

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Figure 1 Eviscerated uterus through the vulva. The distal uterine body wall is everted making the mucosa visible, with evident signs of necrosis. The serosal surface of both uterine horns is visible, which confirms evisceration and allows differentiation from uterine prolapse, in which only the uterine mucosa is apparent to the exterior

kitten. The owner manipulated the protruding mass as if it was an obstructed kitten, but this provoked profuse bleeding, which prompted the owner to seek emergency veterinary consultation.

On presentation, physical examination revealed mild tachypnea (48 respirations/min), mild tachycardia (200 beats/min) and mild dehydration (estimated 5%), the mucous membranes were pale and lacked observable capillary refill, and pulses were weak. The abdomen was distended, and signs of pain were elicited on palpation. Indirect blood pressure measured using Doppler ultrasonography was mildly decreased (systolic blood pressure 80–90 mmHg; reference interval [RI] 110.0–180.0 mmHg).¹³ What was thought to be a uterine prolapse was an evisceration of most of the uterus through the vulva. The distal region of the uterine body was torn 360°, and the edge was everted showing the uterine mucosa, which had signs of necrosis. Both uterine horns were eviscerated, almost entirely, through the vulva (Figure 1).

A serum biochemical analysis was performed and showed: low packed cell volume (22%; RI 25–45%) and normal proteinemia (6 g/dl; RI 6.0–7.9 g/dl) attributed to subacute bleeding; mildly increased glucose concentration (14.3 mmol/l; RI 3.3–6.7 mmol/l) attributed to stress; normal creatinine (102 µmol/l; RI 80–194 µmol/l); and mildly increased blood urea nitrogen (30–40 mg/dl; RI 14–36 mg/dl) attributed to mild dehydration. A metabolic acidosis (pH 7.1; RI pH 7.27–7.40) with hyperlactatemia (6.2 mmol/l; RI 0.37–2.81 mmol/l)¹⁴ was present. An abdominal ultrasound limited to the reproductive system was able to identify only a uterine horn containing a dead fetus, and a small amount of free abdominal fluid.

For stabilization and in preparation for an emergency surgical procedure, ampicillin 22 mg/kg (Ampicillin Sodium; Novopharm) and two boluses of lactated Ringer's solution, 10 ml/kg in 15 mins and 5 ml/kg in 10 mins (Plasma-Lyte A; Baxter), were administered intravenously (IV). The patient's systolic blood pressure increased to 110 mmHg. Analgesia was administered (hydromorphone 0.05 mg/kg IM [HYDROMORPHONE; Sandoz]; remifentanyl 5 µg/kg/h continuous rate infusion IV [Remifentanyl Hydrochloride; SteriMax]) and pre-oxygenation was performed via a facemask.

Anesthesia was induced with midazolam 0.2 mg/kg IV (Midazolam Injection; Sandoz) and propofol 1 mg/kg IV (PropoFlo; Zoetis), and the queen was intubated with a cuffed endotracheal tube that had an inner diameter of 4.5 mm. Anesthesia was maintained with isoflurane (Isoflurane; Fresenius Kabi), and intraoperative monitoring included capnography, electrocardiogram and pulse oximetry performed with a multiparameter patient monitor (Life Window; DigiCare Animal Health). Intraoperative analgesia was provided with epidural locoregional analgesia (bupivacaine 0.5 mg/kg epidural [Bupivacaine Injection; SteriMax]) and an infusion of remifentanyl 5–7 µg/kg/h IV. Because of the preoperative anemia and hypotension during anesthesia (systolic blood pressure 50 mmHg), dopamine 5–7 µg/kg/min (Dopamine; Baxter) and norepinephrine 0.1 µg/kg/min (Norepinephrine; Sandoz) IV infusions were initiated at the time of induction, a blood transfusion was given (11 ml/kg of whole blood, type A, IV transfusion over 4 h) and fluid therapy intraoperatively consisted of crystalloids 6 ml/kg/h IV (Plasma-Lyte A; Baxter), and a bolus of colloids 10 ml/kg IV over 10 mins (Voluven; Fresenius Kabi Canada).

A midline laparotomy was performed. There was a moderate amount of blood in the abdomen, with some blood clots located in the caudal abdomen dorsal to the urinary bladder. The right uterine horn was identified with a dead fetus inside (Figure 2). The left uterine horn and left ovary were absent, and the ovarian pedicle was not ruptured, but the left suspensory ligament with its ovarian artery and vein were severely elongated (Figure 3). The right and left ovarian pedicles were ligated and transected. The right uterine horn was double ligated and transected distal to the location of the fetus to separate the intra-abdominal and eviscerated parts and remove the uterus. Once the left ovarian pedicle and the right uterine horn were ligated and transected, gentle retraction allowed exteriorization of the rest of the uterus and the left ovary from the vulva. Upon manipulation of the uterine stump dorsal to the bladder, urine extravasation was noted. A small cystotomy was performed to introduce a 5 F urinary catheter (Covidien) in a normograde manner to help to identify the urethra during correction of the vaginal tear. The remnant of the vaginal vault was severely damaged making it

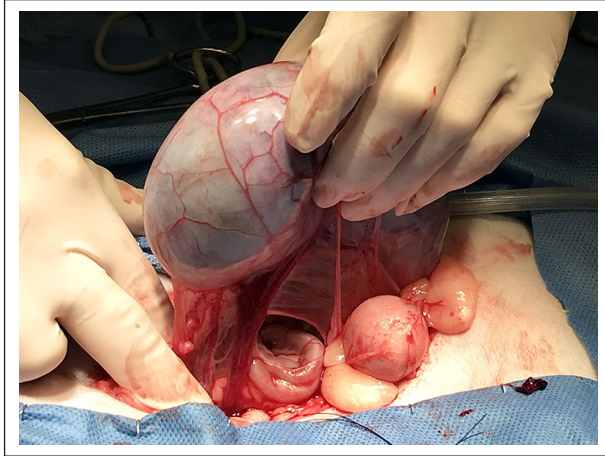


Figure 2 Right uterine horn with a dead fetus inside (the head of the animal is to the left). This is the sole part of the reproductive tract (with the right ovary) that remained in the abdomen

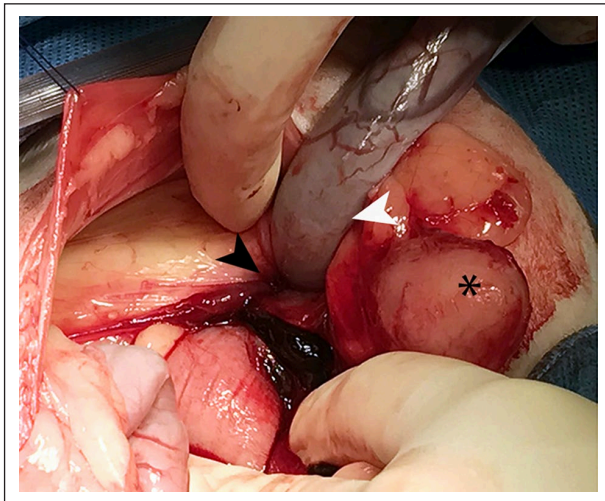


Figure 3 Caudal abdomen (the head of the animal is to the left). A moderate amount of coagulated blood was found dorsal to the urinary bladder (asterisk). Only a portion of the right uterine horn and the right ovary were visible in the abdomen (white arrowhead). The left ovarian pedicle was severely elongated (black arrowhead). The left uterine horn and left ovary were not identified during laparotomy

difficult to identify its margins (Figure 4). Careful closure of the vaginal tear was performed with absorbable sutures (polydioxanone 3-0) making sure not to compromise the urethra. The abdomen was lavaged with warm saline and abdominal wall closure was routine.

The queen recovered well from anesthesia and was hospitalized for a total of 5 days. Postoperative care included fluid therapy with crystalloids 2 ml/kg/h IV, remifentanyl 5–7 µg/kg/h IV, enrofloxacin 5 ml/kg slow IV q24h (Baytril; Bayer), ampicillin 22 mg/kg IV q8h and

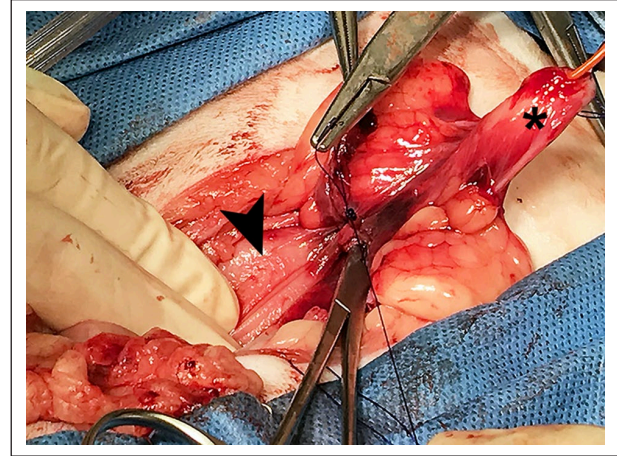


Figure 4 Caudal abdomen after the uterus had been removed (the head of the patient is to the left). The remnant of the vaginal vault was torn and severely damaged; this structure is located between the urinary bladder (asterisk) and the colon (black arrowhead). A Halsted mosquito hemostat is inside the lumen of the vagina to help identify the margins before its closure. A 5 F urinary catheter was introduced normograde in the proximal urethra via a cystostomy to protect this structure during closure

maropitant 1 mg/kg IV once (Cerenia; Zoetis). A 5 F urinary catheter was left in place for the first 3 days, and the cat was able to urinate voluntarily thereafter without difficulty. The intravenous analgesia was progressively transitioned to sublingual buprenorphine 0.02 mg/kg q8–12h (Vetergesic Multidose; Champion Alstoe Animal Health). Intravenous antibiotics were discontinued and the queen was prescribed amoxicillin–clavulanic acid 62.5 mg PO q12h (Clavaseptin; Vetoquinol) to complete a total of 10 days of antibiotherapy.

Discussion

This report describes a rare case of vaginal vault rupture with a pregnant uterine evisceration through the vagina in a queen during labor. Transvaginal evisceration has been described in women as far back as the nineteenth century, and since the beginning of the twentieth century more than 100 cases have been reported, mostly in postmenopausal or multiparous women after vaginal traumas caused by coitus, obstetric instrumentation in the vagina, direct trauma, hysterectomy or after pelvic surgery.^{6,12} The risk was increased in combination with straining (intense cough or constipation) and/or vaginal ulceration.⁶ In veterinary medicine, although low in incidence, eviscerations of abdominal organs through the vagina have also been reported in difference species. Most cases described are multiparous pregnant ewes in which a spontaneous partial or total dorsolateral vaginal tear close to the uterine cervix allowed evisceration of intestines and uterus occurring approximately 1 week

before parturition.^{8,15} Three cases of small intestine evisceration have been reported in three mares; in two, intestines eviscerated through a tear in the vaginal fornix dorsal to the cervix secondary to natural breeding, and in the third, several meters of small intestine eviscerated through the external urethral orifice after rupture of the urinary bladder.¹⁶ Four cases of transvaginal evisceration have been reported in dogs,^{9–12} and, to our knowledge, only one case was ever reported in the queen.⁵ Most of the reported cases were related to violent trauma, dystocia, obstetrical manipulations or misuse of oxytocin and were accompanied by intestinal, vesical and/or uterine herniation, similar to what has been described in women.⁶

When only the uterus is eviscerated through the vagina, it can be mistaken with a uterine or vaginal prolapse. Unlike in vaginal and uterine prolapse in which medical treatment and reposition of the organs might be an option, when an evisceration is present, emergency surgical intervention is necessary to reposition the eviscerated organs and suture the vaginal defect with a combination of laparotomy and external manipulations. Survival rates of animals suffering vaginal organ evisceration are low, presumably owing to the poor general condition of the patients and the time elapsed between the insult and the treatment. Early recognition is critical in these patients.

In the present case, the evisceration occurred during the active phase of parturition; three kittens were already delivered uneventfully and we believe that the vaginal tear was due to strong pressure exerted on the organs in the pelvic cavity aggravated by inappropriate manipulations of the organs by the owner. It is likely that what the owner first identified was a vaginal/uterine prolapse (as suggested by the eversion of the distal portion of the uterine wall; Figure 1) and their manipulations resulted in a complete tear of the vagina and the uterine evisceration. The tear was of 360° and the exact anatomic location was difficult to determine owing to the condition of the reproductive tract at the time of parturition. The uterine cervix was not identified but as the tear had a very distal location, we are referring to it as a vaginal tear as we do believe the location was at the limit between the uterus and the vagina and that the remnant tissue in the abdomen corresponded to the vagina.

The patient arrived with tachycardia, hypotension, dehydration and anemia secondary to abdominal bleeding from the vaginal tear, and developed considerable hypotension during anesthesia that required the use of intravenous vasopressors and a blood transfusion for normalization. These signs are consistent with the critical status of these patients and are indicators that a proper and rapid stabilization and surgical intervention are important in these cases. Treatment was performed using a combination of an abdominal approach and

manipulation of the eviscerated portion of the uterus through the vagina. Once the ovariohysterectomy was performed, suture of the torn vagina was difficult owing to the friability of the tissues and the proximity of the external urethral orifice.

Conclusions

Transvaginal organ evisceration, associated or not with parturition or dystocia, is a clinical condition that requires early recognition and prompt surgical intervention for successful treatment and patient survival. Careful inspection and evaluation are essential to differentiate uterine evisceration from uterine prolapse as these two clinical conditions may have similar presenting clinical signs, but surgical intervention is guaranteed when uterine evisceration is present.

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Ethical approval This work involved the use of non-experimental animals only (owned or unowned), and followed established internationally recognised high standards ('best practice') of individual veterinary clinical patient care. Ethical approval from a committee was not necessarily required.

Informed consent Informed consent (either verbal or written) was obtained from the owner or legal custodian of all animal(s) described in this work for the procedure(s) undertaken. No animals or humans are identifiable within this publication, and therefore additional informed consent for publication was not required.

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