

## **Dystocia due to Secondary Uterine Inertia in Dog and its Surgical Management**

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Received: June 08, 2020

Published: September 08, 2020

### **Abstract**

Uterine inertia is a lack of or decreased uterine wall contraction during labor and parturition that are associated with different factors and forms. A case of secondary uterine inertia with a dead fetus in the uterus was presented to the Veterinary Teaching Hospital of Mekelle University with a history of 28 hours duration of dystocia. Upon vaginal examination and palpation, the fetus was dead and emphysematous. Putrid smelling lochial discharges were coming out through the vagina. The bitch was showing frequent labor pain, licking the hind part, pyrexia, and had gone for off feed for twenty-four hours. An emergency caesarean section was performed under general anesthesia to deliver the dead fetus using the ventral midline laparotomy approach and the abdomen layers were closed using the routine methods. Postoperatively, PenStrep, and Tramadol hydrochloride were given for three days. Besides, modified Elizabethan collar was applied and the wound was healed without any postoperative complication. Hence, Caesarean Section using a ventral midline laparotomy approach is an alternative to deliver the dead emphysematous fetus in dog and its successful management was presented in the present case report.

**Keywords:** Caesarean Section; Secondary Uterine Inertia; Dog; Emphysematous Fetus

### **Introduction**

Dystocia is one of the reproductive problems that occur when the first or second stage of labor is prolonged and assistance is required for delivery. Dystocia is a difficulty of parturition that represents a true emergency faced by the veterinarian, and effective management is essential for the survival of both fetus and dam and the dam's subsequent fertility. It has a direct negative impact on the fetus (e.g., prolonged hypoxia, significant acidosis, vigor, increased stillborn calves, etc.) and dams (e.g., trauma, paresis, metritis, endometritis, etc.). The causes can be maternal factors (uterine inertia, inadequate size of the birth canal) and/or fetal factors (oversized fetus, abnormal orientation as the fetus enters the birth canal) [1, 2]. Dystocia due to secondary uterine inertia leading to the stuck of a dead fetus in the cervical canal is rare in companion animals [3]. Maternal causes especially improper cervical dilation appears to be a more frequent cause of dystocia in most domestic animals [2]. The cause for dystocia in bitch may be the fetal or maternal origin and the incidence being higher on the fetal side (75.3%) than maternal (24.7%) [1]. In dogs, the condition occurs mostly due to uterine inertia that may be partial or complete. In partial uterine inertia, labor ends prematurely while incomplete uterine inertia, the labor period is unable to start [4]. Among various factors, uterine inertia constitutes the biggest maternal cause of dystocia in bitches. The causes of inertias

includes failure of the uterus to respond to fetal signals because of the presence of one or two puppies and thus, there is insufficient stimulation to initiate labor (the single puppy syndrome) or because of overstretching of the myometrium by large litters, excessive fetal fluids, or oversized fetuses [5, 6]. Moreover, in 75% of the cases, primary uterine inertia is also the cause of dystocia in maternal side [1]. This may be due to anatomical abnormalities or disturbances of the physiological interaction between hormones (oxytocin) and electrolytes (low plasma calcium concentration). Secondary uterine inertia is most commonly the result of uterine exhaustion following obstructive dystocia [7]. This may occur due to an obstruction in the birth canal or may happen spontaneously during second stage parturition. Other causes of inertias may be an inherited predisposition, nutritional imbalance, fatty infiltration of the myometrium, age-related changes, and deficiency in neuroendocrine regulation [8].

The incidence of dystocia in companion animals like the bitch and queen is quite low but when it occurs it may constitute life-threatening situations to both the dam and the fetus [2, 6]. The incidence of dystocia varies according to the breed of dog i.e. the brachycephalic (short-faced) breeds such as the Bulldog and Boston terrier, for example, have a higher incidence than crossbred dogs due to large fetal head size. According to a

survey by England [1], bitches of 2-4 years of age were found to be more affected than the adult one. Efficient diagnosis of dystocia is dependent upon taking an accurate history and performing a thorough physical examination on time. The clinician must quickly obtain a careful reproductive history detailing breeding dates, any ovulation timing performed, historical and recent labor, as well as a general medical history [3, 8]. In the present surgical case report discusses the diagnosis and surgical management of dystocia due to secondary uterine inertia in local breed bitch.

### Case History and Presentation

A five-year-old local breed bitch weighing 16 kg was presented to Mekelle University Veterinary Teaching Hospital, College of Veterinary Science with clinical findings of anorexia, dull, depression, frequent licking of the perineal area, putrid-smelling black to greenish discharges from the vagina (indicating placental separation and fetal distress) and frequent granting. The owner informed as the animal had already given birth of one puppy 12 hours before admission to VTH. On clinical examination, the animal was found lethargic, dehydrated, and pyretic (40.3 0C). On per vaginal examination, the birth canal was found moist with bad odor and discharges. Only posterior limb extremities could be palpated at deep pelvic inlet. The bitch was unable to deliver the next puppy due to long straining without any progress. Additionally, free gas was seen accumulated within the fetus with overlapping of bones of fetal skull confirming dead fetus. Upon on external palpation of the abdomen, there was hard mass found in the abdominal cavity. As there was a clear symptom of toxemia with dead emphysematous fetuses which could not be delivered normally; emergency surgery by caesarean section was decided to be performed under general anesthesia with adequate resuscitation measures taking utmost care not to spare the life of the bitch.

### Preoperative Preparations, Animal Handling and Anesthetic Protocol

Preoperatively, the bitch was administered with an intramuscular injection of Penicillin (24mg/kg), and dihydrostreptomycin sulfate (30mg/kg) (Pen & Strep® Norbrook UK) a few hours before the beginning of surgery. The dog then was properly restrained and premedicated with Atropine sulfate (dose rate of 0.04 mg/kg, intramuscularly). The bitch was sedated with Ana-Sed® (xylazine HCl, Heartland Vet Supply Ltd at a dose rate of 1.1mg/kg, Intramuscularly). After proper sedation, the dog was positioned in dorsal recumbency and the ventral abdomen was aseptically prepared by clipping the hair, shaving, scrubbing, washing with water, and salvon® (Cetrimide 3% and Chlorhexidine gluconate 0.5% solution).

Shaving of the hair was done gently, parallel to the skin, and then the skin was scrubbed with diluted chlorhexidine solution until the gross debris had been removed. Finally, the incision areas were scrubbed again with povidone-iodine solution and made ready for surgical incision. Then, general anesthesia was achieved by intravenous administration of a cocktail of Xylazine (dose rate of 1.1mg/kg) @ 0.15mg/kg and ketamine (Ketamine Hydrochloride manufactured in Germany, dose rate of 5mg/kg I.V). Then the bitch was kept in dorsal recumbency with the limbs loosely tied on the table to stabilization dog. The dog was kept on fluid therapy soon after induction (5% Dextrose solution plus 0.9% NaCl, 1000ml stat, I.V., Addis pharmaceutical, Adigrat Ethiopia, at a surgical rate of 10ml/

kg/hr. and calculated rate 1-drop/sec) to maintain the acid-base balance and minimize the risk of complication.

### Surgical Correction

A ventral midline incision was made and the skin, subcutaneous tissue, and line alba were incised one by one caudal to the umbilicus and to exteriorize the uterus. The abdominal cavity was cautiously entered, the gravid uterus was exteriorized and the remaining abdominal organs were packed with sterile drape to prevent peritoneal contamination. A stab incision was made on the uterus with a scalpel blade on the ventral midline of the uterine body on the avascular area and the incision was extended with Metzenbaum scissors to sufficient length for easy removal of a dead fetus. Then, the dead fetus was moved to incision site by gently pushing and squeezing the uterine horn. Then, the placenta was removed by gently pulling from the endometrium and removed the dead fetuses. Before closing the incised uterus, the uterine content was checked to the level of ovary for the left fetus if any and thoroughly cleaned with sterile saline water to minimize the contamination of the uterus. Then, the uterus was sutured with chromic catgut 3-0 size using Cushing fashion in two layers of inversion.

The surgical area of the uterus was checked for hemostasis before returning to normal position and the abdominal cavity was also lavaged with sterile saline solution and suctioned to remove uterine contents. Finally, the surgical site was closed in three layers. The line alba and peritoneal fascia were sutured together with simple continuous pattern by using polyglycolic acid 910 (vicryl) 2-0 sizes. The subcutaneous tissue was sutured in ford interlocking suture pattern and skin were sutured using a subcuticular (intradermal) manner by using polyglycolic acid 910 (vicryl) 2-0 size with a buried knot to avoid licking of suture material. After the closure was finished, the incision site was scrubbed with a diluted iodine solution.

### Post-Operative Care and Outcome

Postoperatively, Penicillin (24mg/kg) and dihydrostreptomycin sulfate (30mg/kg) (PenStrep® Norbrook UK) IM was administered for three days and Tramadol hydrochloride (Tramadol hydrochloride 2%, Sakar Health care Pvt. Ltd, Gujarat, India) at a dose rate of 2mg/kg IM B.I.D was administered for three days post-operation. Besides, modified Elizabethan collar was applied and the owner was advised to follow the dog for any complication as well as a sign of discomfort. The bitch has recovered successfully 14 days post-operation.

### Discussion and Conclusion

In the present case report, the dead fetus was expelled from the uterus. The main reason for the lack of expulsion of a dead fetus in the present case may be due to primary uterine inertia which is common in canine and feline species [9]. Moreover, the case was managed through caesarian section (laparohysterotomy). This is in agreement with the previous report of Sahoo et al., [6] that uses similar technique to manage dystocia in bitch. The main goals of the caesarean section are the preservation of the dam and fetus and the future reproductive efficiency of the dam. Besides, caesarian section is means the extraction of the fetus or foeti from the mother through a surgical opening in the abdominal wall and the uterus and indicated for obstructive dystocia that is accompanied by systemic illness, primary or secondary uterine inertia, and prolonged active labor [2, 10, 11].

There are different available surgical approaches for caesarean section and the selection of an approach should be based on the type of dystocia, the dam's condition, the environmental conditions, the availability of assistance, and the surgeon's preference [6, 12, 13]. The caudal midline approach predominates over the flank approach since the flank approach has potential complications and might lead to difficulty in removing the entire uterine body and cutting several layers. Besides, the caudal midline approach needs less time to enter the peritoneal cavity, enables easily accessing the uterine body and decreased bleeding from linea alba [10, 14]. Similarly, in the present study, recumbent ventral midline laparotomy approach was used to manage the dystocia in the bitch and was found successful.

Uterine inertia as the main cause of dystocia in bitch and queens and it may be due to poor abdominal muscle tone that leads to difficulty in producing uterine contraction in the second stage of labor [10, 15]. This primary uterine atony may have been caused by the maternal dystocia that is believed to occur when fetuses fail to produce sufficient ACTH and cortisol to initiate the birth process [16]. During the case management, the bitch was premedicated with atropine sulfate to reduce the bronchial secretion and GIT motility. This is also similar with the principle and anesthetic protocol, stated by Fossum et al., [10] in which it is normally recommended to decrease maternal stress and anxiety as well as to decrease the doses of induction and maintenance of anesthetic agents.

Several variables may affect the successful outcome of surgical procedures; case selection is the most important and often overlooked variable. Besides, patient and surgeon preparation, surgical technique, viability of the fetus at the time of surgery, and exteriorizing the uterus can affect outcomes. Moreover, a good surgical technique such as gentle tissue handling, selection of appropriate suture materials and patterns, and adequate in-folding of the uterine incision to prevent leakage, combined with antibiotics and anti-inflammatory medication when indicated, can help to minimize further complication that may adversely affect the future reproductive efficiency of the cow [2, 10, 13]. This agrees with the current case management in terms of surgical management and outcome of the case.

In conclusion, a caesarean section on recumbent ventral midline laparotomy was an effective in the management of dystocia due to uterine inertia.

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