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Clinico-Therapeutic Management of Primary Partial Uterine Inertia in Persian cat

P.M. Chauhan[1], K.D. Patel[2] and Raish Pathan[3]
Dr. V.M. Jhala Clinical Complex
Department of Veterinary Clinics
College of Veterinary Science and Animal Husbandry
Kamdhenu University (KU)
Sardarkrushinagar - 385505 (Gujarat)

Abstract

A queen was presented with history of three live kittens delivered before 30 hours and then labor ceased. Primary partial uterine inertia was identified as cause of dystocia, which was successfully treated with ecbolic therapy, which included injections of Oxytocin and Calcium gluconate in dextrose normal saline intravenously. One live kitten and a dead kitten were delivered spontaneously per-vaginally. The queen cat recovered without any complications following the therapy.

Keywords: Calcium gluconate; oxytocin; primary partial uterine inertia; queen

Introduction

In queen, uterine inertia is most common cause of maternal dystocia, in which uterine musculature losses it's normal physiological contractibility during or after parturition (Arthur *et al*., 2001). It accounted for 60.60 percent of total cause of dystocia (Ekstrand and Linde-Forsberg, 1994). It may be either primary or secondary type of uterine inertia. Primary uterine inertia is mainly associated with hormonal dysfunction especially uterine musculature non-respond to stimulation of oxytocin, whereas in secondary uterine inertia, exhaustion of uterine muscle due to obstructive type of dystocia (Robert, 1982). Among uterine inertia, primary uterine inertia is most common cause of dystocia in the case of queens and it contributes around 36.8 percent (Line-Forsberg and Eneroth, 2000). In polytocous small animals, the uterus may fail to begin contracting entirely or partially. In partial failure, the uterus may push the first fetus to pelvic inlet, from which it is delivered by abdominal straining, after that, uterine contractions are stopped, despite presence of fetuses inside the uterus. An idiopathic type of primary partial uterine inertia has been described, in which delivery begins normally, and several members of the fetuses are delivered usually. There is no evidence of obstruction to birth canal through maternal or fetal factors. The uterus stops contracting and does not resume unless ecbolic therapy is administered, according to Jackson (2004). This article describes dystocia due to an idiopathic type of primary partial uterine inertia and its successful management by medicinal ecbolic therapy in a Persian cat.

1. Assistant Professor and Corresponding author.
E-mail: pmchauhan@kamdhenuuni.edu.in
2. Assistant Professor, Department of Veterinary Medicine
3. Post Graduate Scholar, Vanbandhu Veterinary College, Navsari

History and Clinical Observations

A four years old Persian queen cat in her second parity, weighing 4.1 kilograms, was presented with history of queening that began with delivery of three live kittens at midnight and ended with no kittens being delivered after that. According to owner, the queen was no longer straining after giving birth to three kittens, but her abdomen was still distended.

The queen was found to be quite awake and energetic. The temperature was 102.5°F and heart rate was 146 beats per minute. The vulva was mildly swollen. The vaginal discharge was reddish in color and odorless. Abdominal palpation revealed the presence of kittens. The birth passage was fully dilated on digital palpation vaginally, with no fetus or its parts observed at pelvic brim or in the passage. Within the uterus, however, a kitten was touched to the tip of the middle finger. Trans-abdominal real-time B mode ultrasonography confirmed the presence of two kittens, one alive and the other dead, based on their heartbeats and echogenicity (Fig.1). The uterine wall was thickened and amniotic fluid exhibited relatively low echogenicity. As queen was active and cervix was fully dilated, it was decided to use ecbolic therapy to expel the retained kittens.

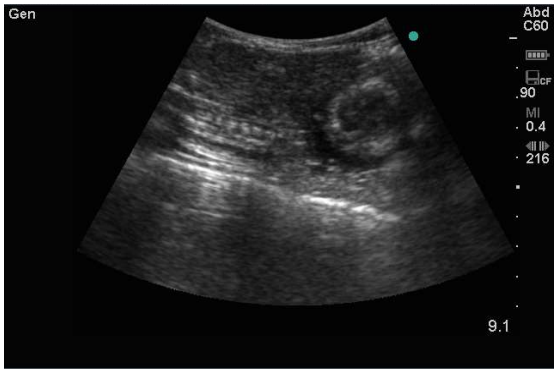

Fig. 1: Sonogram showed foetal presence

Fig. 2: A viable newborn kitten delivered spontaneously

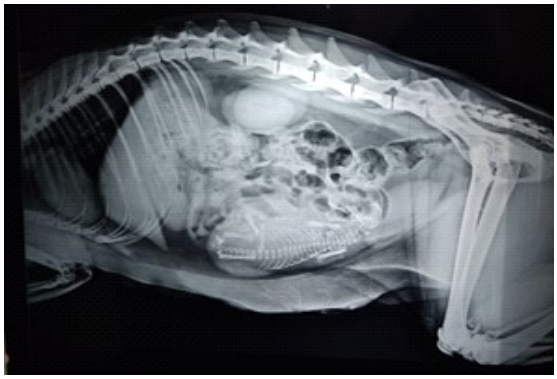

Fig. 3: Lateral abdominal radiograph revealed single fetus inside uterus in anterior presentation

Fig. 4: A dead kitten delivered spontaneously in anterior presentation

Treatment

Queen was administered with slow intravenous infusion of Oxytocin (10 IU; Inj. Oxykop[a]) and Calcium gluconate (150 mg; Inj. Gluci[b]) in 250 ml of 5 percent Dextrose normal saline solution over three hours. The progress of queening was monitored through intermittent per-vaginal examinations. One live kitten was expelled in anterior presentation during the therapy (Fig. 2). Primary newborn care of the kitten was taken; placed on a warm and dry towel, removing residues of placenta, clearing upper airways from the fetal fluid by suctioning and rubbing the neonate until it is dry and ligated the umbilical cord below abdominal wall. We waited for an hour, but the second kitten did not arrive and straining subsided again. As a result, the owner was advised to wait for 4 to 6 hours to deliver the retained kitten.

On next day, second ultrasonography was performed, that revealed presence of a dead fetus. Abdominal lateral radiography confirmed a single fetus in anterior presentation within the uterus (Fig. 3). On per-vaginal examination, the birth passage was still fully dilated. The kitten's head and limbs were palpated after inserting finger through contracted ring anteriorly to the fetus. So, the same medical ecbolic therapy was continued with same doses. 20 ml of liquid Paraffin as lubricant was infused and poured into the birth canal and around the kitten *via* a contracted ring into the uterus by inserting a plastic A.I. sheath. A dead male kitten with compressed head and anterior limbs was expelled spontaneously (Fig. 4). This compressed head and limbs indicated bandal's ring tightly contracted around the fetus. The queen was treated

a - Brand of Kopran Laboratories Ltd., Mumbai
b - Brand of Neon Laboratories Ltd., Mumbai

with Amoxycillin + Potassium Clavulanate (Tab. Toxo-mox[c] at 25 mg/kg b.wt., P.O., B.I.D.), Melonex[d], Syp. Metaflam[c] at 0.2 mg/kg b.wt. P.O., O.I.D.) for five days was given. The queen was completely recovered without any post-therapy and post-partum complications.

Discussion

Primary partial uterine inertia occurs when there is enough uterine activity to initiate parturition, but it is insufficient to complete normal birth of all fetuses without obstruction. In present case, the birth passage was fully dilated, but only tip of the middle finger was touched by the fetus, which might be due to the flaccid uterus (Purohit and Gaur, 2004). The Oxytocin hormone is crucial in initiating uterine contractions at time of parturition (Arthur *et al.*, 2001). The Low plasma Oxytocin level is a cause of primary uterine inertia in bitches with normal serum calcium concentrations and aggravates the condition in bitches with low calcium levels (Bergstrom *et al.*, 2006; Bergstrom *et al.*, 2010). Further, subclinical hypocalcemia is also one of the cause of uterine inertia (Freak, 1962). Generally, two drugs *viz.* Oxytocin and Calcium gluconate, relieve primary uterine inertia as Oxytocin initiates and increases the frequency of rhythmic uterine contractions, which help the fetus to pass through fully dilated birth canal. Calcium gluconate increases the strength of myometrial contractions and enhances Oxytocin's effects (Feldman and Nelson, 2004). Therefore, it is necessary to give energy, Oxytocin and Calcium gluconate to surpass primary partial uterine inertia. In present case, both injections were given in saline by intravenous drip technique over several hours, which worked similar to physiological procedure after properly lubricating the birth canal and fetus. Hence, delivery of two kittens happened spontaneously. The queen expelled only one viable kitten after first dose, but another kitten was expelled after second dose of same injections on next day. The placenta was wrapped around the first viable kitten while it was dropped just after delivery of the second dead kitten. Similar to present study, the researcher reported successful treatment of uterine inertia with intravenous infusion of Oxytocin and Calcium (Shille, 1983 and Jones and Joshua, 1988). However, rapid administration and high concentrations may cause hyperstimulation of the uterus that lead to uterine rupture and fetal death due to asphyxia besides cardiac arrhythmia (Dominguez *et al.*, 1999 and Phaneuf *et al.*, 2000). Further, Calcium gluconate had advantage over Calcium borogluconate because of dangerous boron toxicity in small animals (Purohit and Gaur, 2004).

In present case, the Persian cat has expelled three viable kittens normally at home and then labor ceased even though more numbers of fetuses were present inside the uterus. This cessation of queening might be due to low level of Oxytocin and Calcium or psychotic abnormalities and voluntary nervous inhibition of parturition due to pain (Robert, 1982). The presented cat might suffer from a low level of Oxytocin, Calcium or both because the cat responded to therapy. However, some authors reported no significant relationship between Calcium level of primary uterine inertia or dystotic queen with normal parturition (Jackson, 2004; Bailin *et al.*, 2021). Successful management of uterine inertia by surgical intervention and removing a single macerated fetus has been recorded (Parmar *et al.*, 2017). This therapy also prevented post-partum complications like retained placenta, metritis, pyometra and delayed involution of the uterus.

In prolonged dystocia, uterine myometrium may become fatigued and produce a contraction ring (Bandal's ring) that contracts tightly around the fetus or caudal to it and obstruct normal labor process (Robert, 1982). According to Benesch and Wright (1951), it is an intermediate character between primary and secondary uterine inertia. This character may be further complicated; if not recognized, it may result in rupture of the uterus if forced extraction is applied. In present case report, adequate lubrication around the fetus and birth canal led to spontaneous expulsion of a dead male compressed kitten in anterior presentation trapped in contraction ring as possible. In this case, both kittens were delivered in anterior presentation. However, anterior and posterior presentation ratio was found to be 60:40 percent (Johnston *et al.*, 2001).

This report shows dystocia due to an idiopathic type of primary partial uterine inertia in Persian queen cat and their successful management. Both ultrasonography and radiography are found to be useful techniques for diagnosing and handling such cases.

c - Brand of SavaVet Healthcare Ltd., Pune

d - Brand of Intas Animal Health, Ahmedabad

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