COMPICATIONS OF SINGLE-PUP PREGNANCIES, ITS CLINICAL DIAGNOSIS AND MANAGEMENT IN DOGS: REPORT OF TWO CASES

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Complications of single-pup syndrome in two female dogs (1 German shepherd and 1 Nondescript) were ultrasonographically and radiographically diagnosed. Ultrasonographic examination of the abdomen in both the cases revealed presence of single dead foetus in gravid uterine horn. Survey lateral radiographs of the abdomen showed presence of an S-shaped beaded radiopaque structure, consistent with single-pup pregnancy. Further, an emergency caesarean section was performed to resolve the conditions.

Key words: Dogs, Radiography, Single pup syndrome, Ultrasonography

B-mode real-time ultrasonography provides a highly accurate method of diagnosing pregnancy in dogs (Jackson, 2004). It is a useful diagnostic technique to confirm the presence of live or dead puppies especially in late gestation between 61 and 70 days after mating (Noakes et al., 2009). Foetal numbers can be quite accurately assessed with the help of ultrasonography if the numbers of foetuses are less than four (Jackson, 2004). Radiography is a useful technique for the diagnosis of suspected pregnancy, especially with a single puppy that may have suffered prolonged gestation (Noakes et al., 2009). One fetus pregnancy has been termed as single pup syndrome. It can occur in any breed but the highest incidence is said to occur in Scottish terrier (Jackson, 2004). It is believed that the single puppy fails to produce sufficient adrenocorticotropic hormone (ACTH) and cortisol to initiate parturition. Having outgrown its placental supply of oxygen and nutrients, puppy dies in utero. A life-saving hysterectomy may be the only way of resolving such cases (Jackson, 2004). Reports of single pup syndrome in literature are rare (McLean, 2012 and Hajurka et al., 2005). In the present study, complications of single-pup pregnancy in two female dogs (1 German shepherd and 1 Nondescript) was ultrasonographically and radiographically diagnosed and managed surgically.

Material and Methods

Animals

A three year old German shepherd dog (case 1) weighing about 27 kg was presented with a 69 days history of suspected pregnancy. Feed and water intake was normal. On clinical examination, the animal was bright, alert and active with a good physical condition (body condition score of 3/5). Heart rate, respiratory rate and rectal temperature were within normal limits. Oral as well as conjunctival mucous membranes were pale pink and capillary refill time was less than 2 seconds. On palpation, presence of abdominal mass was appreciated. Another adult stray nondescript female dog (case 2) weighing about 16 kg was presented with a primary complaint of restlessness, changed behaviour (apathy, decreased food intake) after showing signs of whelping. Whelping signs started 24 hours prior to presentation. At presentation, the animal had a lowered rectal temperature. Respiration and heart rates were elevated. On examination, presence of a minute quantity of dirty, green-black, odorless vaginal discharge was observed. Upon digital vaginal examination, a fetal head in the partially opened cervix was felt. Further, radiographic and ultrasonographic examinations were used for definitive diagnosis of those cases.

Ultrasonographic and radiographic examinations

Ultrasoundographic examinations of the abdomen in both the cases were performed...
using real-time ultrasound equipment with 3.5 MHz curved array transducer. The hair at the examination area were clipped and skin was shaved. After application of acoustic gel to transducer, abdomen was examined. Ultrasonographic examination of uterus showed a hyperechoic structure close to endometrium (foetus) and a hypoechoic area (gestational sac) within boundary of another hyperechoic structure (uterine wall) in the transverse plane. Survey lateral radiographs of the abdomen revealed an “S” shaped beaded radiopaque mass, consistent with single-pup pregnancy (Fig. 1). Further, in order to resolve those conditions, an emergency caesarean section was planned.

Fig. 1. Left lateral radiograph of the abdomen showing presence of an S-shaped beaded radiopaque mass (arrow) in a female nonfoetal dog

Fig. 2. Intraoperative image showing gravid right uterine horn (a) and showing exteriorized nongravid left uterine horn (b) in single foetus a female German shepherd dog

Fig. 3. Intraoperative image

Surgical Procedure

Both the female dogs received a pre-operative subcutaneous injection of 40 µg/kg Atropine sulfate and an intravenous injection of 0.5 mg/kg Diazepam. An antibiotic, Ceftriaxone sodium at the dose of 20 mg/kg, was administered intravenously twice, before and after surgery. General anaesthesia was induced with an intravenous injection of 10 mg/kg Ketamine HCl and maintained with repeated boluses of Diazepam and Ketamine HCl, as needed. In case 1, animal was then positioned in right lateral recumbency, and the left flank was prepared for aseptic surgery. A left flank oblique celiotomy was performed. Abdominal inspection indicated a single fetus pregnancy. The right gravid uterine horn was exteriorized (Fig. 2) and an incision was given on caudal aspect of greater curvature of uterine horn. The dead fetus was exteriorized by applying traction on the head (Fig. 3). A bolus containing Nitrofurazone, Metronidazole, Urea, and Povidone iodine was placed inside the uterus and the uterus was closed with Lambert’s pattern using number 1-0 chromic catgut in single layer. In case 2, animal was positioned in dorsal recumbency, and ventral abdomen was prepared for aseptic surgery. A ventral midline celiotomy was performed. Left gravid uterine horn was identified. An incision was given on caudal aspect of the greater curvature of uterine horn and extended towards uterine bifurcation. One dead fetus was found in left uterine horn in anterior presentation and ventral position. The fetal head was firmly lodged close to the partially opened cervix. Following a moderate traction dead fetus was exteriorized. At the owner’s request a standard ovariohysterectomy was performed. In both the cases, abdominal muscles were closed with number 1 Polylactin-910 in a single layer simple interrupted suture pattern. Subcuticular suturing was done using 1-0 polyglactin-910 and the skin incision was closed with nylon in
a simple interrupted suture pattern. Postoperative analgesia was provided by meloxicam (0.2 mg/kg intramuscularly, once daily) for 3 days. Ceftriaxone sodium (10 mg/kg intramuscularly, twice daily) was administered for 7 days. Three hours post surgery animals were discharged with necessary advice. The bandage was changed and wound lavaged daily with sterile saline containing Povidone iodine solution till wound healing. Skin sutures were removed on postoperative day 12. The long term outcome of animal was inquired by telephone contact.

**Results and Discussion**

Using this technique, foetal numbers can also be quite accurately assessed when the number of foetuses was less than four as also reported by Jackson (2004). Ultrasonographic findings of uterus in both the cases of this study were suggestive of presence of single dead foetus in gravid uterine horn. In order to further confirm the number of foetus (es), an abdominal radiography was performed following ultrasonography, revealing an S-shaped beaded radiopaque mass which was consistent with single-pup pregnancy.

In the present study, the German shepherd female dog fails to whelp on the expected date. The failure to whelp in time, might be due to single-pup pregnancy, as a result of insufficient secretion of ACTH and cortisol as also mentioned by McLean (2012). Although, we could not estimate the cortisol in the study, but the failure of whelping indicates that luteolysis did not initiate in the bitch. However, in case number 2, the process of parturition was initiated inspite of presence of single pup in uterus but not completed due to foetopelvic disproportion, a complication leading to dystocia. Previously, a similar case was reported by Hajurka et al. (2005) in Schnauzer bitch in which single pup syndrome had led to complication of pregnancy characterized by spontaneous uterine rupture and eversion of puppy’s intestine through its ruptured abdominal wall at the umbilical cord. To resolve the conditions, a life-saving caesarean section was performed, and the death of the puppies in the current study perhaps may be due to outgrown its placental supply of oxygen and nutrients as also reported by Jackson (2004).

**Summary**

Current report discusses complications of single-pup pregnancy in dogs, their definitive diagnosis based on ultrasonographic and radiographic findings and surgical management.

**References**


