

*Case Report***Management of Foetal Mummification in Canine****B. Konwar*, H. Bayan, K. Sarma and D. Talukdar**

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Abstract

The present study was conducted to diagnose and management of foetal mummifications in canine. Ten mixed breed dogs aged between 4.5 to 6 year of age were brought to the TVCC, CVSc & AH, CAU, Selesih, Aizawl, Mizoram, with the history of mating two and half months in six and three months earlier in four bitches. Animals were anorectic, dull, depressed with congested mucous membrane and distended abdomen. Abdominal palpation revealed distended uterus with palpable hard masses. Haematological examination revealed low haemoglobin, packed cell volume and total erythrocyte count and leukocytosis with neutrophilia. Blood biochemical examination showed hypoproteinemia, hypoalbuminemia and elevated aspartate aminotransferase, alanine aminotransferase, alkaline phosphatase, blood urea nitrogen, gamma glutamyl transferase and serum creatinine. Radiography confirmed the presence of mineralized mass and evidence of some skull and tubular bones in the uterus in six bitches and was irregularly mineralized mass with the detail of some skull (five numbers) and tubular bones in other four cases. Ovariohysterectomy was performed and recorded with five mummified foetuses each in all the cases with chocolate mummification. All bitches recovered uneventfully.

Key words: Hypoproteinemia, Mummification, Ovariohysterectomy, Radiography**How to cite:** Konwar, B., Bayan, H., Sarma, K., & Talukdar, D. (2020). Management of Foetal Mummification in Canine. International Journal of Livestock Research, 10(3), 212-217. doi: 10.5455/ijlr.20190809111951**Introduction**

Failure of pregnancy is usually divided into embryonic mortality and foetal mortality. Foetal mortality is unpredictable and influenced by several factors and mummification is one possible outcome. Although foetal mummification has been described in dogs, there are no accurate figures for incidence, although it is assumed to be very low (Lefebvre, 2015). Foetal mummification does not occur during first half of the pregnancy as embryonic or foetal death prior to the development of the foetal bones usually followed by resorption (Johnston *et al.*, 2001 and Lorenz *et al.*, 2009). Foetal death occurring in the late gestation, not associated with abortion or maceration, may be followed by foetal mummification. Foetal mummification is a sterile process due to

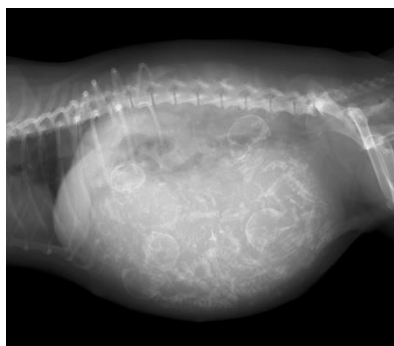
morphological changes of the retained dead fetus after first half of the pregnancy, in the presence of a mature foetal skin resistant to autolysis (Grunert *et al.*, 2005 and Linde-Forsberg, 2010). Ossification of foetal bones leads to foetal mummification after foetal death, if there is no bacterial infection concurrent with or causing death of the foetus (Robinson *et al.*, 2003). Uterus contracts on the foetus, placental fluids gets absorbed and foetal membranes become shriveled, dried up (Roberts *et al.*, 2004) and resemble parchment (Arthur *et al.*, 2001). Foetal mummification has been reported in several species but more common in cattle; uncommon and sporadic in canine (Roberts, 2004) and is common in polytocous and rare in monotocous species (Perumal and Srivastava, 2011). Ten cases of canine foetal mummification and its surgical management is reported in this paper.

History, Clinical Observations and Diagnosis

Ten mixed breed dogs aged between 4.5 to 6 year of age were reported with the history of prolonged gestation (mating two and half months in six bitches and three months earlier in four bitches), anorexia since one week were presented to the TVCC, CVSc & AH, CAU, Selesih, Aizawl, Mizoram.

Physical examination of the animals revealed normal mammary gland, no evidence of imminent parturition signs with normal vulva, congested mucous membrane, dull, depressed and distended abdomen. Abdominal palpation revealed uterine distension with palpable hard masses. The bitch did not show any clinical manifestations of approaching whelping. Haematological examination recorded with significantly decreased haemoglobin (9.28 ± 0.57 gm/dl), packed cell volume (28.52 ± 2.76 %) and total erythrocyte count (4.11 ± 0.19 M/mm³) with leukocytosis (31.76 ± 0.87 cells/mm³), lymphopenia (5.99 ± 0.23 %) and neutrophilia (91.35 ± 1.34 %). Blood biochemical examination revealed significantly decreased total protein (4.23 ± 0.42 g/dl), albumin (1.45 ± 0.09 g/dl) and significantly elevated aspartate aminotransferase (51.38 ± 3.69 U/L), alanine aminotransferase (61.33 ± 3.37 U/L), alkaline phosphatase (120.87 ± 24.87 U/L), blood urea nitrogen (38.78 ± 5.86 mg/dl), gamma glutamyl transferase (12.97 ± 2.16 U/L) and serum creatinine (2.13 ± 0.32 mg/dl).

Radiography revealed enlarged uterus with irregularly mineralized masses, evidence of overlapping foetal skull bones and tubular bones inside the uterus in three months mating history (Fig. 1a & 1b) and other cases were recorded with evidence of skull (five numbers) and bones inside the uterus (Fig. 2a & 2b) with irregularly mineralized masses was suggestive of autolytic changes following death. Trans-abdominal ultrasonography with 5 MHz transducer revealed hyperechoic fetal bones and vertebrae, without any soft tissue structures around them, absence of foetal fluids and foetal heartbeat. From the radiography it was diagnosed as the case of mummified foetus and similar observation was also reported by Shwetha *et al.* (2014).

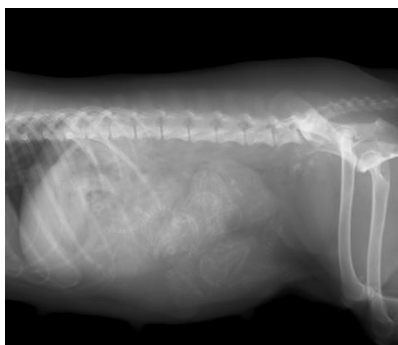


1a



1b

Fig. 1a & 1b: Radiography revealed enlarged uterus with irregularly mineralized masses in three months mating history bitches.



2a



2b

Fig. 2a & 2b: Radiography revealed irregularly mineralized masses with evidence of skull (five numbers) and bones inside the uterus in two and half months mating history bitches.

Surgical Management

Bitches were prepared for caudal mid ventral laparotomy and were premedicated with Meloxicam @ 0.2mg/kg B.W. IM and Ceftriaxone @ 25 mg/kg B.W. IV. Glycopyrrolate @ 0.01mg/kg BW IM, dexmedetomidine @ 5µg/kg BW IV and butorphanol (@ 0.1mg/kg BW IV were administered as preanaesthetics and general anaesthesia was achieved with propofol @ 1mg/kg BW IV as induction agent and isoflurane as maintenance agent. During surgery DNS was administered @ 20ml/kg BW IV. On uterine examination it was observed that the uterus was very fragile (Fig. 3) and uterine wall was closely adhered to the foetuses in all the cases. Ovariohysterectomy was performed in all the cases as the foetuses were adhered to the uterine wall. Betadine solution was poured inside the abdominal cavity to reduce the post-operative abdominal adhesion. Laparotomy incision was sutured with 1-0 Vicryl followed by subcuticular and skin suture and sealed with sterile general dressing (GD-15). Each bitch was recorded with five numbers of dehydrated foetuses surrounded by dark wet chocolate coloured viscous adhesive material without odour (Fig. 4).



Fig. 3: Fragile uterus filled with mummified foetuses in all the cases.



Fig. 4: Five numbers of dehydrated foetuses present in the uterus.

Post-operatively Ceftriaxone @ 25mg/kg B.W. IV daily for five days, Meloxicam @ 0.2mg/kg B.W. IM and DNS @ 15ml/kg B.W. IV daily for three days were administered. Daily dressing was done for 7 consecutive days with Wokadine® solution and sutures were removed on 10th post-operative day and all the bitches made uneventful recovery.

Discussion

Low haemoglobin, packed cell volume, total erythrocyte count and leukocytosis with neutrophilia recorded in the present cases of mummified foetus was also reported by Bindari and Shrestha (2012) and might be due to passage of red blood cells into the uterine lumen by diapedesis (Vorwald *et al.*, 2012). Hypoproteinemia and hypoalbuminemia recorded in the present cases were also reported by Bindari and Shrestha (2012). Hypoproteinemia might be resulting from dehydration or increased synthesis of acute phase proteins and antibodies in response to bacterial infection and inflammation. Hypoalbuminemia might be due to a lack of protein ingestion consequent to anorexia as a result of decreased liver synthesis of albumin, haemorrhages and protein loss (Vorwald *et al.*, 2012). Elevated aspartate aminotransferase, alanine aminotransferase, alkaline phosphatase, blood urea nitrogen, gamma-glutamyl transferase and serum creatinine value recorded in the present study were also reported by Patil *et al.* (2013) in dogs with closed pyometra. Increased aspartate aminotransferase might be due to inhibition of liver enzyme synthesis or hepatic membrane damage (Kumar *et al.*, 2016). A major cause of increased serum alkaline phosphatase activity in dogs was due to cholestatic liver diseases (Fransson *et al.*, 1997). Increased serum alkaline phosphatase in the present study was indicative for the involvement of liver which indicated intrahepatic cholestasis, which also had been suggested as a possible consequence of endotoxaemia (Sato *et al.*, 2002). Elevated blood urea nitrogen and creatinine levels recorded in the present findings might be due to organic tissue destruction, altered in organ functions, including kidney and liver function (Ravishankar *et al.*, 2004) and also might be due to the deleterious effect of toxins from mummified foetus on kidney and dehydration (Kumar *et al.*, 2016).

Distended uterus with irregularly mineralized overlapping foetal bones with evidence of skull and bones inside the uterus observed in the present study with radiography was also reported by Bindari and Shrestha (2012). Hyperechoic fetal bones and vertebrae, without soft tissue structures, absence of foetal fluids and foetal heartbeat observed with ultrasonography in the present study was also reported by Shwetha *et al.* (2014). Each bitch was recorded with five numbers of dehydrated fetuses surrounded by dark wet chocolate coloured viscous adhesive material without odour. Once all fluids were completely reabsorbed, the fetal membranes and uterine wall adhered closely to the foetus and the whole mass became brownish black, leathery in appearance and odorless. It might or might not have exudates which were resulted from the degeneration of red blood cells (Kennedy and Miller, 2007 and Lefebvre, 2015). Chocolate coloured viscous adhesive material above the mummified foetus was indicative of chocolate mummification (Sandoval-Castillo and Villavicencio-Garayzar, 2008). Mummification that produced a dry, stiff foetoplacental unit with no exudates was called papyraceous mummification and had been reported in dogs, cats, cattle, buffalo, and sharks (Lefebvre, 2015). The main reason for the lack of expulsion of dead mummified foetus in present cases might be due to primary uterine inertia which is common in canine species (Romagnoly *et al.*, 2004) and the primary uterine atony also caused maternal dystocia (Vorwald *et al.*, 2012).

Conclusion

Imaging techniques like radiography and ultrasonography are safe and non-invasive techniques for the diagnosis of mummified foetus. Radiography visualized mummified fetuses as irregularly mineralized masses with more radio opaque and compact foetal bones. Ultrasonography showed hyperechoic fetal bones and vertebrae, without any soft tissue structures around them with absence of foetal fluids. Therefore, routine imaging examination of pregnant bitch helps to diagnose the diseases. Surgical treatment by pan-hysterectomy was found an effective method to save the life of the bitches.

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