

Ultrasound guided diagnosis and management of foetal mummification in dairy cattle: A clinical study

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Abstract

A total of six crossbred cows with foetal mummification were brought to the Veterinary Clinical Complex, Faculty of Veterinary Science, SKUAST- Kashmir, India. The animals weighed approximately between 275 to 350 kg and were reportedly inseminated around 4 to 7 months back. Per-rectal palpation accompanied by trans-rectal ultrasonography using 5 MHz to 7.5 MHz transducer was found useful in confirmatory diagnosis and management of affected cows. It was observed that prostaglandin $F_{2\alpha}$ ($PGF_{2\alpha}$) accompanied with valedhamate bromide served as drug combination of choice for luteolysis and cervical dilatation and ultimately the expulsion of foetal mummy. However, in addition, slight transrectal and trans-vaginal manual manipulation (gentle massage cum traction) was also applied in two out of the six cows for the removal of mummy. A broad spectrum parental antibiotic (oxytetracycline) course accompanied by uterine cleansing agent hastened the process of uterine involution and restored normal fertility in the affected cows. In conclusion, diagnosis of foetal mummification using trans-rectal ultrasonography and medical management using combination of $PGF_{2\alpha}$, valedhamate bromide, oxytetracycline and cleansing agent improves the conception rate at first service in dairy cows carrying foetal mummy (4/6 cows conceived, 66.66 %).

Keywords: Cattle, Foetal, Mummification, Ultrasound

Highlights

- A hard mass found on rectal palpation of cows with no foetal viability on USG suggests foetal mummy.
- Induction of abortion in mid gestation is a tough task unless dead foetus or mummy is confirmed.
- USG precisely confirms mummification in cattle during mid gestation, unlike usual rectal palpation.
- Proper treatment for removal of foetal mummy is a must, and it restores future fertility in affected cows.

If foetus dies in-utero post-ossification, complete resorption of foetal material cannot take place, instead foetal mummification follows. The uterus contracts on to the foetus, which becomes twisted and contorted (Arthur *et al.*, 1996). In cattle, mummification is commonly observed between 4th to 8th months of gestation and haematic mummification is the norm. In this condition, the foetal fluids are resorbed, but the foetus and membranes are surrounded by a viscous, chocolate coloured material. The foetal death without abortion, persistent corpus luteum and progesterone influence collectively lead to the formation of the mummified foetus (Vikram *et al.*, 2020). Mummification is occasionally diagnosed in cattle (Shah *et al.*, 2018), buffalo (Yadav *et al.*, 2019) and occurs sporadically in both exotic and indigenous breeds of cattle (Jana and Ghosh, 2014)

Mummification in cattle is generally difficult to diagnose on routine transrectal examination because the affected cows seldom pass abnormal cervico-vaginal discharge. However, a hard mass could be felt on routine pregnancy diagnosis per rectum in some dairy animals (Lokavya *et al.*, 2022). Ultrasound scanning helps in pregnancy diagnosis (Naikoo *et al.*, 2013) and confirmatory diagnosis of many reproductive problems, including foetal mummification (Kumar and Purohit, 2009). Some reported aetiological factors include bovine viral diarrhea (BVD), leptospirosis and mold infections - *Neospora caninum* (Ghanem *et al.*, 2009), torsion of the umbilical cord and some compressive factors (Mahajan and Sharma, 2002), uterine torsion (Moore and Richardson, 1995), placental defects, infectious agents, abnormal hormonal concentrations, drugs, genetic anomalies and chromosomal

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abnormalities (Vikram *et al.*, 2020). However, a definitive aetiology is seldom recognized due to a varied degree of tissue degeneration.

A total of 06 crossbred cows (one each from Pattan Baramulla and KVK, Ganderbal) and 4 cows from adjacent villages of Ganderbal, Jammu and Kashmir, India were brought to the Veterinary Clinical Complex, Faculty of Veterinary Science, Shuhama, Srinagar. All the 6 cows weighed approximately between 275 to 350 kg, had insemination history of around 4 to 7 months and were brought for either routine pregnancy diagnosis or referred doubtful infertility problems. On rectal palpation, a hard mass of varying size was observed, and the lively feel comprising of placentomes and fremitus were absent. Four out of six cows had palpable corpora lutea on the right ovary and the other two cows on the left ovary. The blood serum progesterone (P_4) levels estimated using standard ELISA kit on the day of presentation of the case ranged between 1.50 to 3.70 ng/mL. On palpation per-vaginum, the cervix was found closed in all the six cows. But, in two out of the six cows, there was slight non-foetid discharge and brown colour shreds stuck to the obstetrical gloves on palpation per-vaginum. The rectal temperature of the animals was within the normal physiological range (average, 101.6°F).

On transrectal ultrasonography (USG), an uneven hyperechoic area suggesting of foetal ribs and other irregular bony structures was observed (Fig. 1) with little or no foetal fluids inside the embryonic vesicle. Further, no foetal heart beats were detected on scanning the gravid uterus. After per-rectal palpation and confirmation of the mummification by USG, the cows were injected intramuscularly (i.m) with cloprostenol 500 µg (Pragma 2 mL, Intas Pharma India Ltd) and a shot of 80 mg valethamate bromide (Epidosin - Vet, 8 mL, TTK, India Ltd), on day of presentation (first day of confirmation). One shot of Epidosin - Vet, 5 mL i.m. was injected after 48 hours to hasten the dilatation of the cervix. Further, oxytetracycline (Wolicyclin-DS 20 mL Vetoquinol, India, Ltd.) was administered at the rate of 7 mg/kg body weight for five days to check infection, if any. Exapar (Ayurved, India Ltd.) was administered orally to all the six animals post-foetal expulsion @ 100 mL (twice a day) for first day followed by 50 mL twice daily for 3 more days. It was administered as a uterine tonic cum cleansing agent.

It was found that two of the cows expelled out the mummified foetus 72 hours post-Pragma injection. In the two other cows, the mummified foetuses were

expelled out with gentle manual intervention 72 hours post Pragma injection. Manual intervention was done by inserting left hand per-rectum and right hand per-vaginum in the affected cows. The hard mass felt per-rectum was gently pushed by left hand towards the vagina/ vulva and it was grasped by the right hand inserted per-vaginum and the foetuses pulled out smoothly. Similar findings were reported by Jalakas (2000) and Vikram *et al.* (2020). However, in the remaining two cows, a second shot of Pragma was injected on 4th day after first pragma shot due to incomplete dilatation of the cervix and the foetuses were expelled out with manual traction. The foetuses expelled out (along with the placenta) were deformed in shape and size (mummies), dark brown and surrounded by a sticky brown material (Fig. 2).

Four out of six cows conceived (66.66%) on first service between 60 to 120 days post-treatment. The treatment of choice in cases of foetal mummification is induction of luteolysis by injection of $PGF_{2\alpha}$, which is followed by the expulsion of the foetus within 2 to 4 days. Similar findings were also reported by Lefebvre *et al.* (2015), who recorded that the medical and surgical approaches both result in a normal pregnancy rate.

The precise conclusion of foetal mummification is subjective to many aspects. It is difficult to decide whether to go for the induction of abortion in bovine during mid gestation unless a dead or mummified foetus is confirmed. However, confirmatory diagnosis of condition by USG is of considerable diagnostic significance. Further, $PGF_{2\alpha}$ accompanied with valethamate bromide serves as drug combination of choice for luteolysis and cervical dilatation and ultimately for the expulsion of foetal mummy. A course of broad spectrum parental antibiotic (oxytetracycline) may restore the normal fertility in the affected cows post-foetal expulsion. A uterine tonic/cleansing agent will remove the uterine debris, if any, and hasten the process of uterine involution.

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Fig. 1. Hyperechoic area suggesting of foetal ribs and other irregular bony structures



Fig. 2. Deformed foetus in shape and size (mummy), dark brown

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