

# **Bovine Haematic Mummification – New Observations-Report of Two Cases in HF Crossbred Cows in Mekelle**

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## **Abstract**

A five year old HF X local crossbred cow, in her first lactation, was reported by the owner to have overshot her gestation by nearly a month, without showing any signs of udder development and approaching parturition. Clinical examination revealed the presence of fetal head just anterior to the pelvic brim. Attempts to stimulate fetal movements by digital pressure on the eye orbits failed to produce any response. The rest of the uterus appeared as an enlarged structure containing a doughy mass. Fetal fluids and placentomes were not palpable. A tentative diagnosis of fetal mummification was made with a strong probability of an anomalous fetus. Caesarean section was resorted to, through a left ventro-lateral incision. After removal of one fetus in anterior presentation, it immediately became apparent that another fetus of similar size was present in posterior presentation. Both fetuses were tightly covered by leathery fetal membranes and a brownish colored, thick, viscous material. The uterine cavity was cleaned with mild antiseptic solution, before closure of the uterine incision. The abdominal incision was closed routinely. The animal had uneventful recovery and skin structures were removed on day 9. The other animal was a seven year old HF x local cross, brought to the clinic for threatened abortion, with partly necrosed membranes hanging from the vulva. Vaginal examination revealed the presence of a small fetus, tightly surrounded by fetal membranes in the vagina, which was easily removed. The external os was firmly closed and did not admit even one finger. A detailed examination of the fetus confirmed the existence of haematic mummification. This paper records some new features of the condition, so far not reported, in bovine fetal mummification.

**Keywords:** Abortion, Caesarean section, Haematic mummification, Placentomes

Intrauterine fetal death may either end up in resorption or mummification. The later event being common when the death of fetus occurs after ossification of bones has begun and resorption cannot take place. The chances increase with the advancement of gestation stage. In cattle an incidence of 0.13 to 1.8% has been reported (Barth, 1986) and haematic mummification is common. Caruncular hemorrhage has been incriminated to be the cause of fetal death, followed by resorption of fetal fluids and thereafter the fetus, tightly covered by the membranes, being separated from the uterine wall by a viscous mass of clotted blood; giving the uterus a doughy feeling. However whether the inter-placental hemorrhage is the cause or the sequel of fetal death remains unclear (Noakes *et al.*, 2001). A genetic predisposition to the condition has been described in Jersey, Guernsey, and Friesian cattle (Logan, 1973). Recently (Ghanem *et al.*, 2005) investigated the genetic factors in 10 fetal mummies and reported a factor XI gene deficiency, in 2 of these fetuses was heterozygous. Although umbilical cord torsion has also been suggested as a possible cause, this has not been a consistent finding. Hormonal causes have also been suggested (Gorse, 1978). With the absence of concomitant luteolysis, the fetal mummy is indefinitely retained in the uterus in a sterile environment, with the condition being diagnosed when animals are examined for prolonged gestation. Whereas single mummified fetuses have been widely reported, the present paper records a rare case of mummified twins in a HF X local cross and a case of abortion following fetal mummification at about 3 months gestation in two HF x local crossbred cows. Most veterinarians are agreed that the fetal mummy is indefinitely retained in a sterile uterine environment, indefinitely. However, Hafez and Hafez (2000) also reported abortions in early stages of mummified bovine fetuses. The present paper reports two cases of haematic fetal mummification in HF X local crossbred cows, one with twins delivered through caesarean section and the second having aborted at about four months.

### **Case Reports**

A 5 year old cow (local X HF cross), in her first lactation, was reported to have overshot her gestation by about a month, without showing any signs of approaching parturition. The animal was in good body condition, eating and drinking normally, with no clinical signs of illness. Physiological parameters like body temperature, pulse and respiration were in the normal range.

Clinical examination revealed the presence of an enlarged uterus, in front of the pelvic brim, with no fetal fluids, a tightly contracted uterus over the fetus, along with the presence of a doughy mass in between the uterine wall and fetus. Further, careful examination lead to palpation of the right eye orbit of the fetus, but the

fetal head on the other side appeared to be covered by a bony mass so that the left orbit could not be palpated. Vaginal examination revealed a tightly closed cervix. A tentative diagnosis of fetal mummification including the possibility of twins or an anomalous mummified fetus was made.



**Figure 1. Mummified Twin Fetus in Posterior Presentatoin**



**Figure 2. Mummified Twins Tightly Covered by Fetal Membranes, Crown-Rump length 48 cm**



**Figure 3. Mummified fetus aborted at 3 months Exposed, necrotic membrane is black**



**Figure 4. Exposed, aborted fetal mummy with chocolate colored skin. Crown-rump length 15 cm**

### **Treatment**

Since the tentative diagnosis of mummified twins or an anomalous single mummified fetus was made, medicinal treatment was not considered, as it may not have lead to sufficient cervical relaxation to allow vaginal delivery. Therefore, caesareotomy was preferred.

Laparotomy was performed through a 25cm long ventro-lateral skin incision under epidural and local infiltration analgesia, induced with 8ml and 100ml of

2% solution of Lidocaine hydrochloride, respectively. The uterine segment containing a fetal limb was exteriorized and the uterine wall incised. Immediately after removing one fetus in anterior presentation, exploration of the uterine cavity revealed the presence of another fetus (Fig. 1) in posterior presentation. The second mummified fetus was also removed. Both fetuses were tightly covered by the fetal membranes (Fig. 2). The crown-rump length of both the fetuses was about 48 cm, suggesting that fetal death had occurred, probably, around six months of gestation.

The uterus was sutured with double layer lambert sutures after placing 2.5gm oxytetracycline in the uterine cavity. The abdominal incision was closed in four layers. The uterus, peritoneum and the abdominal muscles were sutured with chromic catgut. The skin incision was closed with silk using interrupted pattern. 20ml (4g) of long acting oxytetracycline was administered I/M and 40 IU oxytocin was given I/M, immediately post surgery. The animal made on uneventful recovery and skin sutures were removed on day 9.

The second case was a 7 year old HF x local crossbred cow in her second lactation. The animal was inseminated about four months back. For the last several days the animal was reported to be showing intermittent symptoms of tenesmus, followed by the appearance of membrane like structure at the vulva. No fluid discharge was reported.

At clinical examination the part of the membranes which was hanging from the external genitalia was dark colored and necrosed (Fig. 3). Vaginal examination revealed the presence of a round mass in the anterior vagina, tightly covered by a membranous structure. The whole mass was removed manually. The external surface of the membranous covering (chorion) was without any cotyledons, except at one place where remnants of degenerated chorionic villi were still present. The fetus was covered by a chocolate colored material which had imparted similar coloration to the fetal skin (Fig. 4). The crown-rump length of the fetus was 15cm, suggesting that the fetal death had occurred at about 3 months gestation. Except for removal of the fetal mummy, no other treatment was required; as the animal did not show any other signs of illness.

## **Discussion**

Haematic mummification is one of the common features of abnormal fetal development in bovines. The incidence of this condition has been reported to vary between 0.13 to 1.8%, although in some herds it may be higher (Barth, 1986). The death of a fetus in the uterus without simultaneous luteolysis and cervical relaxation ensures fetal retention. Mummification results due to autolytic changes

in fetal tissues and resorption of fetal fluids in a sterile uterine environment. The dead fetus shrinks through loss of water from the tissues and mummifies. The hemorrhage which occurs between the endometrium and placenta imparts a reddish-brown hue to the fetus and fetal membranes. However, whether the hemorrhage is the cause of fetal death or its sequel is debatable (Noakes *et al.*, 2001).

It is rather difficult to exactly ascertain the cause of fetal death in mummification. Genetic factors have been implicated as the condition was observed to be more common in Jersey and Guernsey breeds and occurred with high frequency in one family of Friesian cows (Logan, 1973). Recently Ghanem *et al.* (2005) reported a factor XI gene deficiency in 10 mummified fetuses. This deficiency is reported to be involved in early stages of blood coagulation pathway and has been described for Holstein cattle (Gentry and Ross, 1993). The patients in the present report were HF x local crosses and it remains an intriguing speculation whether it could have inherited the gene deficiency

It is generally, widely, accepted that induction of abortion by causing luteolysis is the treatment of choice. Before the availability of prostaglandins, estrogens (single or repeated doses) were used (Roberts, 1986). However, with the use of estrogen being banned for food animals, majority of practicing veterinarians prefer a single luteolytic dose of PGF2 $\alpha$ ; with the mummy being expelled in to 2 to 4 days (Dobson, 2005). In the present case this mode of treatment was not considered due to two factors. One was the possibility of existence of twins or a malformed fetus, the second being that, if sufficient cervical relaxation is not produced; vaginal delivery of possible twins or the anomalous fetus may become difficult. Therefore, caesareotomy was preferred and the twin mummies were delivered. Hopper *et al.* (2006) and Jonson (2009) used colpotomy for delivering the fetal mummies, but in these cases the mummies were of small size and therefore, easily delivered by this route. Lefebvre *et al.* (2009) in a retrospective study of fetal mummification in cows not responding to PGF2 $\alpha$  and, relieved of the condition by caesareotomy, observed that 5 out of 14 (36%) conceived shortly after surgery, whereas no pregnancy was recorded in PGF2 $\alpha$  treated cows.

The fetal death in bovine haematic mummification is reported to occur any time between 3 to 8 months of gestation and, therefore, such a fetus where ossification of bones has already occurred, can not be resorbed. Abortion does not occur due to persistence of the corpus luteum. With resorption of the fetal fluids and a tightly closed cervix, the fetal mummy is indefinitely preserved in a sterile environment. In the first case of the present report both mummified twins had a crown-rump length of about 48cms; suggesting that fetal death occurred around six months

gestation. The second case is more difficult to explain. Most of the previous studies have one common observation that fetal mummification in cattle is always associated with persistence of the corpus luteum, concomitant with indefinite retention of the fetal mummy in a sterile uterine environment. However, Hafez and Hafez (2000) reported abortions in fetuses which had become mummified at early stages of gestation. The present case, therefore, appears to be one where fetal death occurred at about 3 months pregnancy, following which the fetus was retained in the uterus for sometime. During this period of fetal retention, the fetal fluids would have been reabsorbed and the uterine wall tightly surrounded the fetus and the membranes. This probably was followed by luteal regression, cervical dilatation and expulsion of the small sized mummy in to the vagina. Following the expulsion of the mummy into the vagina, the cervix would have gone through secondary closure to be completely closed at the time of removal of the fetus.

In the light of the present findings (i.e.) recording two cases in HF crosses within the space of a few months in the same population is on the one hand alarming. It is quite possible that some other cases where early abortions are taking place, may be treated as routine and not being reported. Thus these cases could remain undiagnosed. More important is the fact that the semen of the bull carrying the gene is still being used. Therefore, it is necessary to identify the bull in question and to discard the semen already collected. The occurrence of mummified twins could be explained by the fact that they were identical, monozygotic, twins carried in the same set of fetal membranes. Therefore, after the inter-placental haemorrhage both suffered the same fate. Deaton *et al.* (1958) observed that the cause of mummification could be a “Sex Linked Gene”, rather than an autosomal recessive lethal gene, as all the affected fetuses are males. The mummified twins in the present investigations also were males.

The retention of such females in the herd for future breeding is debatable, unless they are high producing animals. However, if retained, care needs to be exercised to not use the semen of the same male again.

## **Conclusion**

A rare case of mummified twins is reported in a 5 year old HF x local crossbred cow, in her first lactation. The twins were delivered by a lower-left ventro-lateral caesareotomy and the animal made an uneventful recovery. The second case resulted into an early abortion of the single mummified fetus at about 3 months of gestation. Although many different, possible, causes may be involved; it is difficult to pin point the exact aetiological agent. Factor XI gene deficiency, an autosomal recessive gene deficiency, has recently been reported. Retention of such

females for breeding purposes is questionable, unless they are high milk yielders. The affected bulls need to be culled to avoid spreading the condition further.

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