

Case Report - Colpotomy approach for a hystrotomy for the removal of foetal remains in a Holstein-Friesian cow

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Introduction

In cattle the pregnancy is dependent on the presence of progesterone produced by the corpus luteum. However between days 150 and 200 of gestation the placenta is capable of producing enough progesterone to maintain a pregnancy. The condition of bovine foetal mummification is a relatively uncommon. It arises when in-utero foetal death occurs between 3 to 8 months without the loss of the corpus luteum, failure to open the cervix and expel the foetus (Roberts, 1986). Barth (1986), reported that the incidence of the condition is less than 2% in cattle. With this condition, once fetal death has occurred, the amniotic and allantoic fluids are resorbed by the uterus, resulting in the dehydrating the fetal tissues and annex membranes.

There are many proposed aetiologies for this condition. These include genetic conditions including chromosomal defects and abnormal hormonal profiles, infectious conditions including bovine viral diarrhoea (BVD) and leptospirosis, toxins such as aflatoxins and mechanical factors such as uterine torsion, compression and or torsion of the umbilical cord (Roberts, 1986). A definitive diagnosis is rarely obtained due to the mummification process rendering further analysis of the foetus unrewarding (Lefebvre, 2009).

In general the condition has minimal impact of the clinical examination of affected cows. However it has been reported in some cases to cause a reduction in milk production and weight (Frazer G, 2004). The detection of the condition in cows is usually easily made through manual transrectal palpation and/or ultrasonographic examination of the reproductive tract. The mummified foetal mass is immobile within the uterus and on palpation generally feels compact and firm, without placental fluids or placentomes (Lefebvre et al, 2009).

The condition can generally be managed medically through lysis of the corpus luteum using an injection of prostaglandin F_{2α}. This may result in the expulsion of the mummified foetus within 2-4 days of treatment (Lefebvre et al, 2009). If the medical approach fails, then surgical intervention is required. There are two surgical approaches via colpotomy or laparotomy (caudal abdominal/ ventral paramedian). One study examining the fertility in cows post removal of the mummified foetus found that 36% of became pregnant after extraction of the mummified foetus by hystrotomy. Whereas, all animals that were treated medically and the foetus manually extracted failed to become pregnant (Lefebvre et al, 2009).

Case Report

The animal, an 8-year-old Holstein-Friesian, had not been seen to be on cycling and was presumed to be in calf and was presented to a private veterinary practitioner for routine pregnancy diagnosis. On presentation the cow appeared to be alert and in good health, with a conditions score of 6.5 (scale out of 8). On manual rectal palpation it was discovered that the uterus was enlarged and bone-like structures could be palpated in the right uterine horn, and the left horn was within normal limits. The diagnosis of partial foetal mummification was made.

The foetal remains were located in the body of the right uterine horn. The structures within the uterine horn were consistent with a foetal scapular and other bone structures. It was noted that no free fluid was palpated within the uterus. The uterus was located with the pelvis. The ovaries were palpated and were within normal size limits and it was thought a corpus luteum was present in the right ovary.

A manual vaginal exam was then performed. There was evidence of mucoid fluids present and some urine pooling in the caudal vagina. The fluid was clear with no signs of purulent material. The cervix was tightly closed.

Treatment

The cow was first treated medically using intramuscular injection of 2ml Juramate (Cloprostenol sodium 263 microgram/mL, Jurox), then the cow was put on a Bomerol program, 2ml Bomerol (Oestrodial benzoate 1mg/ml, Bayer) intramuscular injections on day 0, 3 and 6 and on day 6, the cow also received an intramuscular injection of 2ml Juramate (Cloprostenol sodium 263 microgram/mL, Jurox). These treatments failed to allow expulsion of the foetal remains. The animal was of considerable value and the owners of the animal wanted to have the foetal remains removed surgically. A flank laparotomy was not considered as a viable option due to the intrapelvic positioning of the uterus and the general size of the animal. The decision to remove the foetal remains via a colopotomy procedure was made.

The procedure was carried out on farm on the 29th January 2014. The cow was restrained in a crush with the neck in the head bail. The following preoperative drugs were give; intramuscular injections of 10ml A.C.P. 2 (Acepromazine maleate 2.9mg/ml, Deltavet), 30ml Alamycin 10 (Oxytetracycline hydrochloride 100mg/ml, Norbrook), intravenous injection of 10mls Planipart (Clenbuterol

hydrochloride 0.03mg/ml, Boeringer Ingelheim), and a caudal epidural anaesthesia with 4ml Lignocaine 20 (Lignocaine hydrochloride 20mg/ml, Ilium) was given. The tail was tied up out of the surgical field. The perineum was clipped with a razor and surgically scrubbed. The vagina and vestibule were flushed with a weak solution of iodine in sterile saline. Stay sutures were placed in both of the vulval lips and anchored to perineal skin dorsolaterally on the respective sides.

A stab incision was made in the right craniolateral vaginal fornix approximately 10 cm caudal to the cervix and at the 1 o'clock position using a surgical scalpel blade number 23. The incision was extended using a combination of blunt dissection with blunt-blunt scissors and digital manipulation. This process continued through the peritoneum and extended to allow access of the surgeons right hand (Figure 2). The cow displayed discomfort during this process and sat down in sternal recumbency in the crush.

The right uterine horn containing the foetal remains was located and retracted through the peritoneal and vaginal incisions until the uterus was visualized at the entrance of the vagina. Whilst the uterine horn was being retracted and grasped, the second surgeon incised directly over the foetal remains and the foetal remains were removed from the uterus. The foetal remains were 5 ribs and a scapula (Figure 4). On digital palpation on other foetal remains were found elsewhere in the horn. The uterus was then flushed with sterile saline and the uterus was closed by an inverting continuous suture pattern using 3 chromic catgut (Figure 3). The vaginal incision was not sutured.

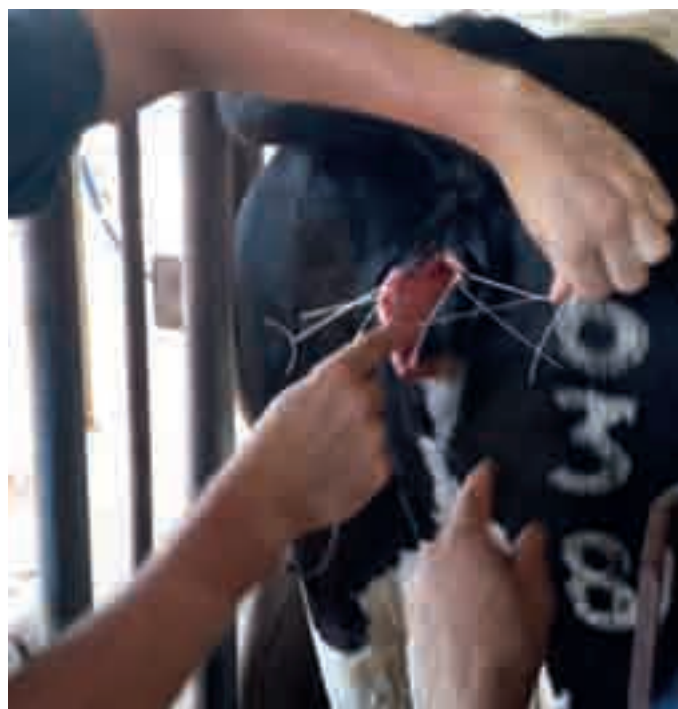


Figure 1. Placement of stay sutures



Figure 2. Exposure of the right uterine horn



Figure 3. Suturing the uterus post removal of foetal remains



Figure 4. Foetal remains removed from the uterus

The animal received the following postoperative treatments, intramuscular injection of 10mls Syntocin (Oxytocin 10 i.u/ml, Ilium) and subcutaneous injection of Metacam 20 (Meloxicam 20mg/ml, Boehringer Ingelheim). A further three days of intramuscular injections of 30ml Alamycin 10 (Oxytetracycline hydrochloride 100mg/ml, Norbrook). Post-operative complications were limited, with the cow showing no signs of discomfort shortly after the procedure.

Ultrasonic examination of the uterus was performed 23 days after the procedure revealed no evidence of uterine adhesions, left ovary was inactive and the right ovary contained a 15mm follicle.

The cow was submitted into an embryo transfer program on May 18th 2014, detailed below:

Day 0 – 2ml intramuscular injection of Prostaglandin F2 α

Day 5 – Insertion of intravaginal progesterone implant (Ezi-Breed CIDR, 1.9g Progesterone, Pfizer)

Day 14 – 3ml intramuscular injection of follicle stimulation hormone (FSH) in the morning and repeated in the evening

Day 15 – 2.5ml intramuscular injection of follicle stimulation hormone (FSH) in the morning and repeated in the evening

Day 16 – 2ml intramuscular injection of follicle stimulation hormone (FSH) in the morning and repeated in the evening, 2ml intramuscular injection of Prostaglandin F2 α and removal of intravaginal progesterone implant (Ezi-Breed CIDR, 1.9g Progesterone, Pfizer)

Day 17 – 1.5 ml intramuscular injection of follicle stimulation hormone (FSH) in the morning and repeated in the evening

Day 18 – Inseminated when on heat

Day 25 – The cow was submitted for embryo retrieval.

It was noted that the left ovary was small and inactive however the right ovary had 4 corpus luteums present. One viable embryo was obtained from the flushing procedure on the 12th June 2014.

Discussion

This case of foetal mummification is unusual as only a part of the foetus remained in the uterus. The aetiological cause for foetal death and mummification was not determined in this case. In majority of mummification cases the aetiological diagnosis is not determined (Irons, 1999).

The time period of which the foetal mummification most commonly occurs is between 3-8 months of gestational age (Roberts, 1986). The gestational age of the mummified foetus is estimated to be 170 days, based on the length of the scapula (Khan, 1989).

The period of time of which mummification of the foetus occurred is unknown. The presence of a corpus luteum would have been responsible for the cow not displaying signs of oestrus. However, the failure for the cow to expel the remaining foetal remains after prostaglandin F2 α and oestrodial benzoate may have been due to uterine pathology.

The intrapelvic location of the uterus did not facilitate a surgical approach via a flank laparotomy. The colpotomy procedure did allow adequate exposure of the right uterine horn containing the foetal remains and therefore surgical removal of foetal remains.

The post-operative complications were minimal and the cow returned to showing signs of oestrus within 30 days of having the procedure. The farm owners did not wish to get her back into calf, they decided they wanted to submit the cow into a superovulation program with the goal of getting embryo's from the cow to put into recipient cows. One viable embryo was obtained from the superovulation program from the right uterine horn 135 days after the procedure was carried out. In this case the colpotomy procedure was considered successful.

The advantages of performing a colpotomy procedure include:

- » The ability of completing the procedure in a standing animal under mild sedation
- » No need for incising through the abdominal musculature via flank laparotomy
- » The procedure is an inexpensive
- » The procedure can be carried out under field conditions

The colpotomy procedure should be considered in cases where hormonal treatments have failed to expel mummified foetal remains from a small to moderate size uterus.

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References

- Roberts S, 1986. "Veterinary obstetrics and genital diseases (theriogenology) 3rd edition". Woodstock, Vermont.
- Barth A, 1986. "Induced abortion in cattle". In Morrow DA, ed. Current Therapy in Theriogenology. 2nd edition. Philadelphia: WB Saunders, 205- 208.
- Lefebvre R, Saint-Hilaire E, Morin I, Couto G, Francoz D and Babkine M, 2009. "Retrospective case study of fetal mummification in cows that did not respond to prostaglandin F2 α treatment". The Canadian Veterinary Journal. 50 (1): 71-76
- Iron P, 1999. "Hystrotomy by colpotomy approach for treatment of foetal mummification in a cow". Journal of the South African Veterinary Association. 7 (3): 127-129
- Frazer G, 2004. "Obstetrics Part 1. Pregnancy complications in the cows". Proceedings of the North American Veterinary Conference 2004. 9-12
- Kahn, W. 1989. "Sonographic fetometry in the bovine." Theriogenology 31(5): 1105-1121.