

Twin mummified fetuses in a Holstein Friesian cow: a case report

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ABSTRACT: Mummification of the bovine foetus is rare in cows. There is currently limited data available on the success of pregnancies following expulsion of mummified fetuses, especially after expulsion of twin mummified fetuses. This report describes a case of the expulsion of twin mummified fetuses from the uterus two days apart and the process of oestrous synchronisation for a new pregnancy of a five-year-old Holstein Friesian cow. The patient was referred with a slimy chocolate-coloured vaginal discharge. Bone fragments directly related to the foetus were visualised using transrectal ultrasonography with no foetal fluid in the uterus. An intramuscular single dose of prostaglandin $F_{2\alpha}$ ($PGF_{2\alpha}$) analogue was given to the cow and antibiotic therapy was started. On the second day of treatment a mummified foetus was seen in the vagina, while another mummified foetus was observed by transrectal ultrasonography in the uterus. Therefore, a $PGF_{2\alpha}$ analogue was re-injected and the second foetus was expelled 58 h later. When the cow showed oestrous behaviour, the vaginal discharge was cloudy and intrauterine treatment was applied. A pregnancy was achieved in the next oestrus. It is suggested that after expulsion of the foetus, the uterus should be lavaged and gynaecological examinations should continue until the patient has normal ovarian and uterine activity.

Keywords: cow; twin; mummification; oestrous synchronisation; pregnancy

In mummification of the bovine foetus, foetal membranes are mummified together with the foetus. Mummification is rare in cows, occurring in 0.13 to 1.8% of conceived animals (Arthur et al., 1996). Foetal mummification occurs after the first trimester of gestation (Roberts, 1986). It can go undiagnosed, because the placenta and corpora lutea (CL) are capable of producing sufficient progesterone. If left undiagnosed the foetus can remain in the uterus for between 150 and 200 days or a normal gestation period (Johnson et al., 1981). There is currently a lack of data on the success of pregnancies following the expulsion of mummified fetuses (Lefebvre et al., 2009), especially after the expulsion of twin mummified fetuses. In the present paper, a unique case of twin mummified fetuses that were expelled from the uterus two days apart and the process of oestrous synchronisation for a new pregnancy is described.

Case description

A five-year-old Holstein Friesian cow, weighing 450 kg, was referred to the Faculty of Veterinary Medicine Animal Hospital at Afyon Kocatepe University, with a slimy chocolate-coloured vaginal discharge. The owner of the cow noted that she had been inseminated 196 days before. Bone fragments directly related to the foetus were visualised using transrectal ultrasonography with no foetal fluid in the uterus (Figure 1). On vaginal examination, the cervix was open and a small amount of uterine discharge could pass through to the vagina. An intramuscular single dose of prostaglandin $F_{2\alpha}$ ($PGF_{2\alpha}$) analogue (*d*-cloprostenol, 0.15 mg, Sincromic, Vilsan, Turkey) was given to the cow and antibiotic therapy was started with ceftiofur hydrochloride (1 mg/kg, Ceftivil, Vilsan, Turkey) by intramuscular injection daily for five days to prevent probable uterine infection. The starting

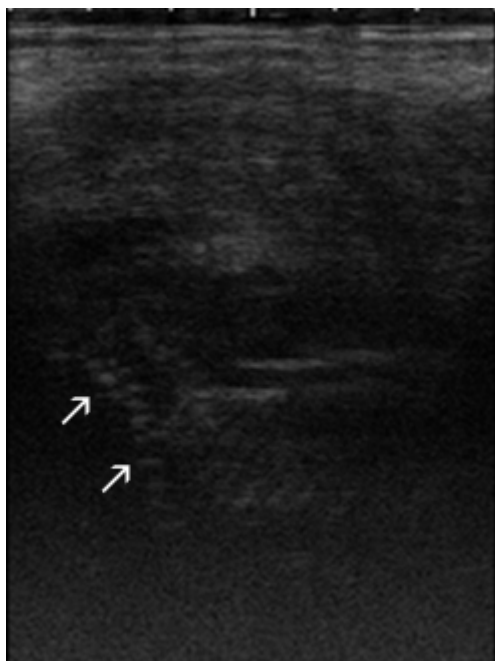


Figure 1. Ultrasonographic image of the bone fragments (arrows) of a mummified foetus in a five-year-old Holstein Friesian cow

day of these treatments is described as the first day of applications.

On the second day, a mummified foetus was seen in the vagina, approximately 36 h after the $\text{PGF}_{2\alpha}$ analogue injection. The size of the foetus including the surrounding foetal membranes was 20×15 cm and the crown rump length (CRL) was 32 cm after removal of the placenta (Figure 2a). After removing the foetus from the vagina, another mummified foetus was seen by transrectal ultrasonography in the right uterine horn. The CL on the right ovary

and a large follicle on the left ovary were also evident. Another single dose of $\text{PGF}_{2\alpha}$ analogue was injected.

On the fourth day, a second mummified foetus was expelled, 58 h after the second $\text{PGF}_{2\alpha}$ injection. This foetus was 13.4×12 cm and the CRL was 21.4 cm (Figure 2b). The mucosa membranes of the cow appeared normal and respiratory and heart rates were also normal. Feed intake was optimal and the cow had a rectal temperature of 38.6°C . On the sixth day, gynaecological examination revealed that the cervix was open and that there was no discharge in the vagina. The CL and follicle on the left ovary measured 1.83 and 0.75 cm, respectively. The right ovary had three follicles with diameters of 1.16, 0.79 and 0.71 cm. On the 13th day, it was observed that the CL on the left ovary was 1.84 cm in diameter and the largest follicle on the right ovary was 2.22 cm in diameter.

One more single dose of $\text{PGF}_{2\alpha}$ was injected into the cow on the 13th day. The following day, a 2.25 cm follicle on the right ovary and a 1.14 cm regressing CL on the left ovary were imaged. The cow also showed oestrous behaviour. The vaginal discharge was cloudy and intrauterine treatment was performed with rifaximin (two cans of foam spray, Fatroximin, Fatro, Turkey). A pregnancy was achieved in the next oestrus. Unfortunately, on telephone enquiry it was found that the calf died during delivery owing to the carelessness of the owner.

DISCUSSION AND CONCLUSIONS

Twin births in the bovine species account for about 1% of all births in beef herds and 5.02% in



(a)



(b)

Figure 2. Mummified fetuses expelled approximately 36 h (a) and 58 h (b) after the first and second injection, respectively, of a prostaglandin $\text{F}_{2\alpha}$ analogue in a five-year-old Holstein Friesian cow

dairy herds (Johanson et al., 2001). Mummification has a low incidence in the cow (0.13 to 1.8%; Arthur et al., 1996). Therefore, the clinical observations related to a case of foetal mummification are even more noteworthy as they are associated with the gestation of twins, which is also a rare occurrence. Based on the aspect of the foetuses and membranes, we suggest that the mummification described here is a haematogenous type due to the partially dry appearance of the foetuses and the presence of bloody and viscous tissue (Roberts, 1986).

The main goal when treating an animal with an abnormal pregnancy related to the foetus is to expel the abnormal foetus so the cow can become pregnant again within the shortest possible time. Although spontaneous abortion of a mummified foetus can occur (Erb and Morrison, 1957), expulsion of the foetus usually requires veterinary medical intervention (Lefebvre et al., 2009). The treatment of choice in cases of foetal mummification is medical and surgical treatment. Medical treatment may consist of administration of a $\text{PGF}_{2\alpha}$ analogue to induce luteolysis, leading to expulsion of the foetus within two to four days (Wenkoff and Manns, 1977). Furthermore, oestrogens may also be used to provoke the regression of the CL and induce contraction of uterine muscles, relaxation of the cervix and expulsion of the mummified foetus (Roberts, 1986); however, oestrogen use may cause infertility (Lefebvre et al., 2009). Surgical removal of mummified foetuses (Roberts, 1986; Lefebvre et al., 2009) remains an option when medical treatment fails. In the present case, we chose to first try medical treatment with a $\text{PGF}_{2\alpha}$ analogue instead of oestrogens, because surgical treatment could have led to a long hospitalisation period, a failed pregnancy (Lefebvre et al., 2009) and potential residual risks following oestrogen treatment (Anderson and Skakkeback, 1999).

The luteolytic cascade of the bovine CL is initiated by surges in uterine $\text{PGF}_{2\alpha}$. A rapid functional regression, characterised by inhibition of progesterone release, is followed by a structural regression (Pate, 1994). In the present case, functional regression and expulsion of mummified foetuses were achieved with $\text{PGF}_{2\alpha}$ use but the CL continued to persist structurally. Secondly, the mummified foetus was expelled 58 hours after a second $\text{PGF}_{2\alpha}$ injection. The uterine endometrium is unable to secrete prostaglandins when endometrial regeneration is delayed (Guilbault et al., 1988). We observed luteal regression and uterine contractions with the

first $\text{PGF}_{2\alpha}$ injection but it was probably not enough to produce the continuous contractions required to expel the second mummified foetus. Therefore, a second $\text{PGF}_{2\alpha}$ injection was administered and expulsion of the second foetus was successfully achieved. According to this observation, repeated $\text{PGF}_{2\alpha}$ injections may be suggested for the treatment of cases of mummified foetuses in order to produce sufficient uterine contractions.

It is reported that the prognosis for fertility after foetal expulsion is good. Cows usually conceive on the first or second oestrous cycle after expulsion (Roberts, 1986); however, many practitioners recommend slaughtering the cow. We found that the first oestrus occurred 10 days after the expulsion of the last mummified foetus with the aid of $\text{PGF}_{2\alpha}$. Moreover, the cow conceived on day 31 after removal of the second mummified foetus.

The foetus and uterine environment are usually sterile; therefore, culturing the foetus is of little value (Elmore, 1992). Although parenteral antibiotic therapy was used in the present case to prevent probable uterine infection, a cloudy vaginal discharge was seen, so intrauterine treatment was performed. It is possible that uterine infusion instead of parenteral antibiotic therapy should have been used to prevent probable uterine infection after expulsion of the foetus.

To the best of our knowledge, we are the first to describe the expulsion of twin mummified foetus at different time intervals with the administration of $\text{PGF}_{2\alpha}$. We strongly suggest that after expulsion of the foetus, the uterus should be lavaged and gynaecological examinations should continue until the patient has normal ovarian and uterine activity.

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