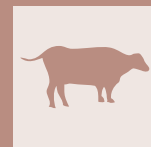


Fetal Maceration in a Heifer: Case Report



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SUMMARY

Fetal maceration is a pregnancy pathology characterized by the death of the fetus at any stage of pregnancy and the failure of the fetus to be removed as a result of the failure of the abortion mechanism. As a result of luteal regression, the fetus undergoes a bacterial autolysis under the effect of bacteria migration the uterus through the opened or partially open cervix uteri. As a result of this bacterial autolysis, necrotic areas in the soft tissues of the fetus and fragmentation in the bones occur. With these fetal destructions, fetal integrity is impaired. Along with these events, the general condition of the animal is affected, presenting loss of appetite, weakness, pain, and a foul-smelling-red/gray vaginal discharge are observed. Vaginal discharge examination and anamnesis help us in terms of diagnosis. In the treatment, medical or surgical interventions are performed according to the decision of the veterinarian. In the presented case report, the interventions performed with a case of fetal maceration in a heifer, which was on the 284th day of pregnancy, and which had a foul-smelling, gray-red discharge and bone fragments from the vagina of a dairy farm were evaluated. As a result of clinical examinations, it was determined that fetal skeletal integrity was impaired and decay started with putrefaction. As a result of the treatment with PGF₂-α to remove the dead fetus from the uterus, it was observed that not all of the tissues of the offspring were removed vaginally and the foul-smelling-prulent discharge continued. It was decided to slaughter of the heifer due to the management policy of the farm and the failure to obtain a positive response as a result of the medical treatment applied. In conclusion, fetal maceration cases in cattle is a pregnancy pathology that adversely affects animal health and fertility. The treatment method to be applied in these cases should be chosen depending on the general condition of the animal and the management policy of the enterprise.

KEY WORDS

Fetal maceration; Heifer; Pregnancy pathology.

INTRODUCTION

It is economically very important to get one calf per cow per year in cattle farms. Fetal maceration prolongs the time between calvings and, as a result, causes losses in farm economy and fertility. Fetal maceration is a pregnancy pathology that occurs as a result of the death of the fetus at any stage of pregnancy and the failure of the abortion mechanism (1). Fetal maceration is seen in cows (0.13-1.8%) (2) and buffaloes (3), and rarely in mares (4), sheep-goats (5) and cats-dogs (6,7). In cows with fetal maceration, luteolysis mechanism has occurred and the cervix uteri is almost open. With the opening of the cervix and uterus, fetal invasion occurs with the migration of contaminant bacteria in the vagina and the environment to the uterus (8). As a result of this invasion, bacteriological degradation, autolysis of soft tissues and decay events occur. After these events, fetal skeletal integrity and a mucopulent content are formed in the uterus. Since the cervix uteri are not fully open,

fetal bone fragments cannot be removed most of the time. In cows with fetal maceration, fetal bone fragments from the uterus, foul-smelling-mucopulent vaginal discharge and intermittent straining help the diagnosis (9). Ecibolic drugs and antibiotics are used in cases of fetal maceration, but the prognosis is generally poor (8,10). In this case report, the diagnosis of fetal maceration, which is rarely seen in cows, and treatment methods are evaluated.

CASE DESCRIPTION

The case material was a Simmental heifer, 2 years old, 500 kg live weight and 284th day of pregnancy, located in Erzurum Atatürk University Food and Livestock Application and Research Center. In the anamnesis taken from the farm veterinarian, it was learned that the heifer was pregnant, bone fragments came from the vagina with a foul-smelling, gray-red discharge, there was no decrease in feed-water intake, and as a result of rectal examination, there were irregular hard structures in the uterus. It was learned that the veterinarian administered Dinoprost 25 mg IM (Enzaprost®, Ceva, Turkey) for 3 days at 24 h intervals to remove the fetus, but only the scapula and mandib-

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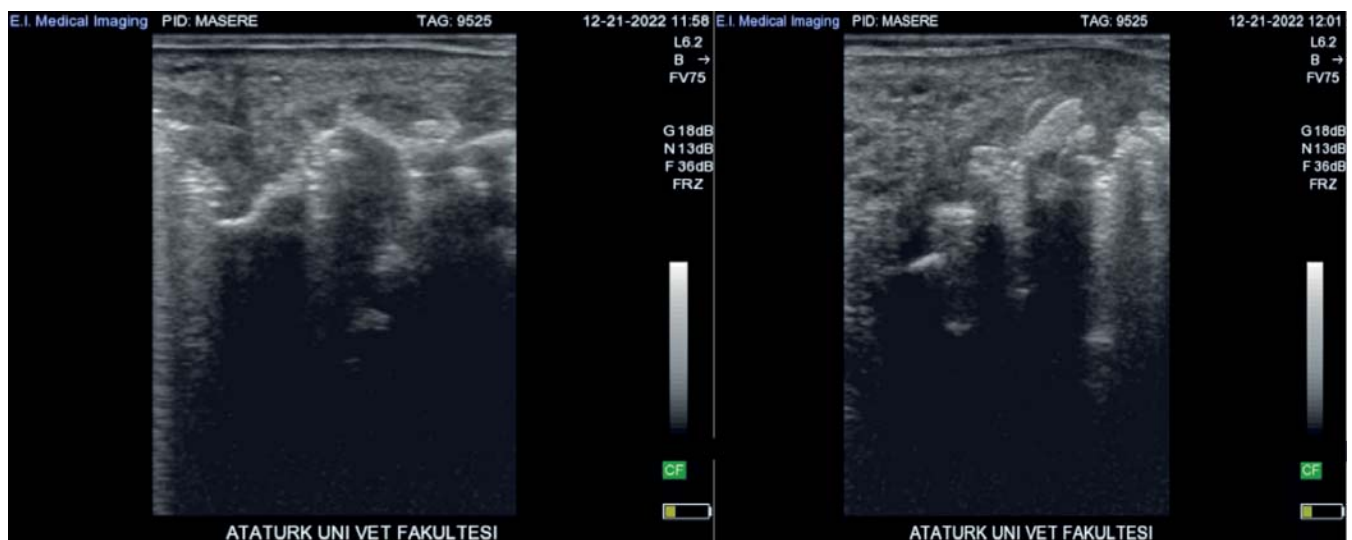


Figure 1 - Hyperechoic areas on the ultrasonographic images.

le of the fetus were removed 2 days after this administration. In addition, it was learned that Ceftiofur Hydrochloride 1 ml/50 kg (Cevaxel®, Ceva, Turkey) was administered for 3 days at 12 h intervals as a preventive antibiotic treatment for the possibility of toxemia in the heifer. After these administrations, the heifer was brought to Atatürk University Veterinary Faculty Animal Hospital for a detailed examination.

As a result of the examinations, it was decided to slaughter the heifer considering that there would be a decrease in the uterine health and fertility rate. The heifer was slaughtered at the Erzurum Meat and Milk Institution about 1 week after the examination in our hospital, depending on the duration of the antibiotic treatment in the meat. Finally, tissue samples were taken from different regions of the uterus for histopathological examination after the slaughter process.

Tissue Tracking Process

Samples from the uterus containing the macerated fetus were placed in 10% formaldehyde solution and fixed for 24 hours. After fixation, the tissues were reduced in size and placed in tissue cassettes for routine follow-up and were washed in running tap water for 1 night to remove formaldehyde. The washed tis-

ues were taken into an automatic routine tracking device (Therma Shandon Citadel 2000) and histopathological follow-up was performed. For this purpose, tissues were kept in 70%, 80%, 90%, 96%, 100% and 100% alcohol for 1 hour each. Subsequently, the tissues were kept in xylene I, xylene II and paraffin for 1 hour each and were placed in pre-melted paraffin and turned into blocks. From the tissues in paraffin blocks, 5 μ thick sections were taken on slides using a microtome (Leica RM2255).

Hematoxylin & Eosin Staining

The sections taken on the slide were kept in an oven at 57 °C for 1 hour to allow the paraffin to melt. Then, the sections were placed in cut I and xylene II solutions and deparaffinization was performed. Sections were passed through decreasing degrees of alcohol solutions (100%, 100%, 96%, 90%, 70%, 50%, 3 min each). The sections passed through alcohols were kept in distilled water for 5 minutes for rehydration. The sections were stained with hematoxylin and washed in tap water after waiting for 3 minutes. Then, the sections stained with hematoxylin were placed in eosin solution, kept for 15 seconds, and then passed through gradually increasing alcohol soluti-



Figure 2 - a)Fetal bones in uterus b)Removed fetal bones c)Macroscopic view of the uterus (Red Circles: Necrotic areas).

ons and transferred to xylene. Entellan was dropped on the sections and covered with a coverslip, and the sections were examined under a light microscope (Olympus BX51).

RESULTS

In the general examination, it was observed that his body temperature was 38.5°C, he had a hunched posture and there were no signs of dehydration. Rectal examination revealed that the fetus was inside the pelvic canal. Ultrasonographic examination (Ibex®Pro, E.I. Medical Imaging® Portable Ultrasound Solutions), revealed images where fetal structures were not clear and hyperechoic areas were intense (Figure 1.). Vaginal examination revealed a foul-smelling, red-cream colored vaginal discharge. In addition, it was determined that the cervix uteri was open approximately two fingers wide. Necrotic areas and inflamed foci on the endometrium were ob-

served in the macroscopic (Figure 2.) and microscopic (Figure 3.) examination of the uterus obtained as a result of the necropsy.

Typical histopathological changes observed in uterine tissue samples from which the mummified fetus was formed are shown (Figure 3.). Desquamation was observed in the lamina epithelialis layer of the endometrium (Figure 3a.). There was severe hyperemia in the vessels in the lamina propria. Additionally, abundant neutrophil leukocytes were found in the lamina propria. Lamina epithelialis underwent degenerative necrosis, and abundant neutrophils, leukocytes, histiocytes, and a few plasma cells and lymphocytes were observed in the lamina propria (Figure 3b.).

DISCUSSION-CONCLUSION

Fetal maceration is a pregnancy pathology that occurs as a re-

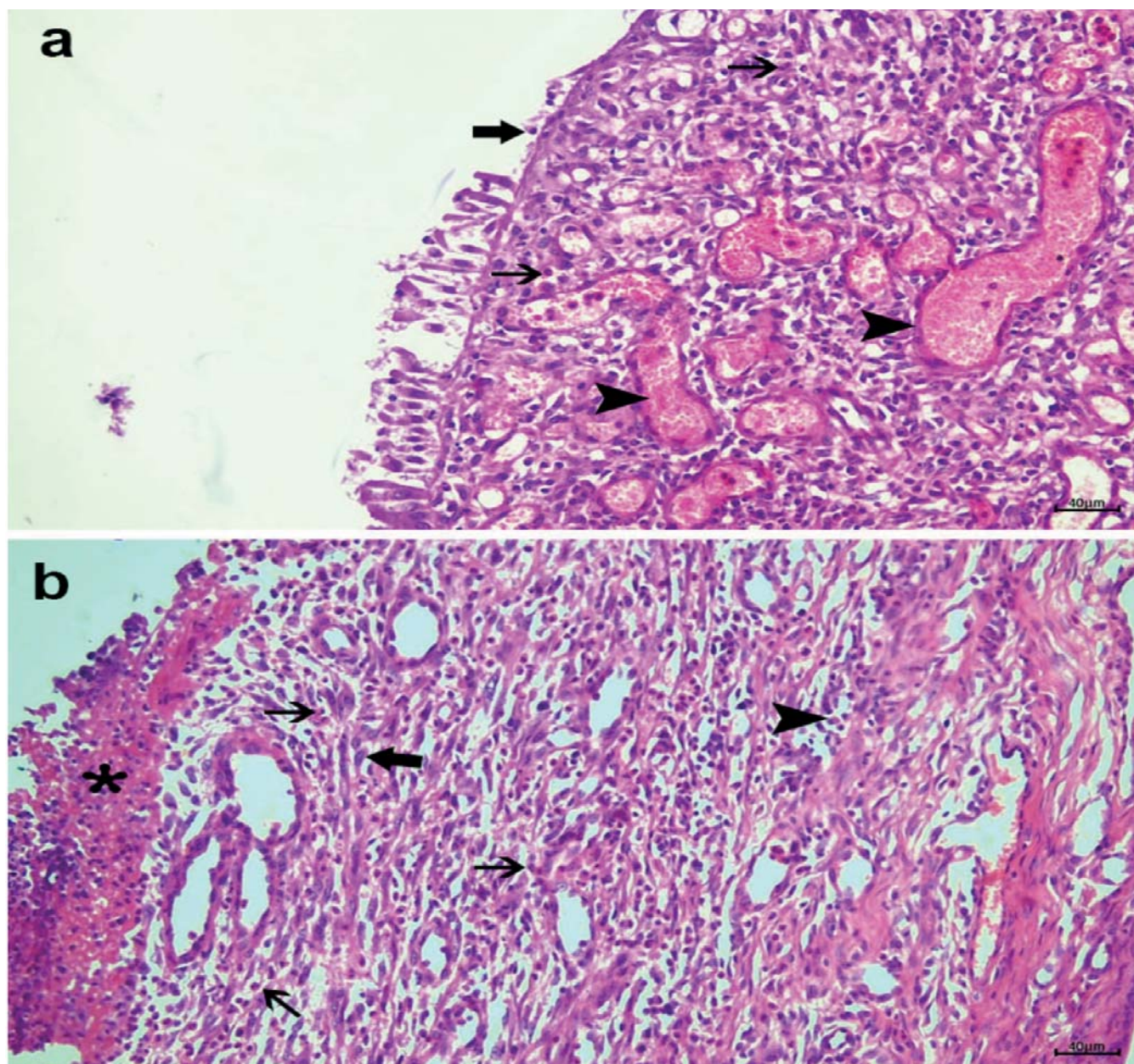


Figure 3 - Uterine tissue of mummified fetus. a) Desquamation of the lamina epithelialis (thick arrow), hyperemia in the vessels in the lamina propria (arrowheads), neutrophil leukocytes (thin arrow). b) Necrotic tissue (star), neutrophil leukocytes (thin arrows), histiocytes (thick arrows) and plasma cells (arrowhead) in the lamina propria. H&Ex20µ.

sult of autolysis in the uterus and the cannot remove the fetus that dies in any period of pregnancy, even though the cervix uteri is open (1). Embryonic and fetal deaths can result from damage to the embryo/fetus or lysis of the corpus luteum during pregnancy (11). Such deaths occurs due to genetic, environmental, and hormonal factors (12). While the embryo is resorbed by the uterus as a result of embryonic deaths, fetal emphysema, mummification or maceration may occur as a result of fetal deaths (13). In cases of fetal maceration, the fetus cannot be expelled vaginally due to various reasons such as abnormal uterine shape caused by the drying of the fetus, incomplete cervical dilation or uterine inertia (8).

Fetal autolysis and invasion occurs as a result of the migration of various pathogenic microorganisms to the uterus through the cervix uteri. As a result of this bacterial invasion, fetal maceration occurs (8). In this case report, it is thought that fetal maceration occurs as a result of the cervix opening as a result of the regression of the corpus luteum and the migration of pathogenic microorganisms to the uterus through the partially open cervix.

In the animals can be seen clinical signs such as foul-smelling purulent-mucopurulent vaginal discharge and straining due to pain (9). Anemnesis, in cases of fetal maceration, presence of bone in the vaginal discharge, rectal and ultrasonographic examination help the diagnosis (14). In the ultrasonographic examinations, the images of the hyperechoic area formed due to bone fragments and pus foci reflected on the echogenic-anechoic areas are observed. In the ultrasonographic examination, we performed in the presented case, images with mixed echogenicity were obtained in accordance with the literature (15).

In cases of fetal maceration, before deciding on the treatment method, vaginal examination should be performed to find out whether the cervix is open. If the cervix is open, the bone fragments in the uterus can be removed manually. In cases where the cervix is partially open or closed, PGF2 α administrations should be performed to assist the lysis of the partially regressed corpus luteum and uterine contractions (3,8). PGF2 α injections may not be effective in cases of fetal maceration when the birth canal cannot allow the fetus to come out or the uterus cannot contract because it cannot respond to hormonal stimuli (16). In the presented case, PGF2 α injection was administered to increase uterine contractions because of the cervix uteri was not fully open, but the fetus was not observed coming out of the vagina. It is thought that the reason why the fetus cannot be expelled is because the PGF2 α injection does not cause sufficient dilatation in the cervix or the birth canal is too dry for the fetus to come out.

It is possible to perform laparohysterotomy in cases where medical treatment is ineffective (17) but, the fact that the heifer in the presented case belongs to a dairy farm eliminates the option of laparohysterotomy. Operation cesarean is also a treatment option used in cases of fetal maceration, but it was not requested by the management as it may cause fertility problems and decrease the heifers fertility in the future (18,19). In the presented case, the heifer was sent to slaughter because the results of the administrations were insufficient and the prognosis of the disease was poor.

As a result, the general condition of the animal, the prognosis and the management policy of the farm are important factors for the treatment method to be applied in such cases. For this reason, in cases of fetal maceration, the general examination of the animal should be done in detail and a correct decision should be made on the treatment method to be applied.

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Conflict of Interest

The authors declare that there were no conflicts of interest.

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