Case Report

# Fetal mummification in a goat

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## Abstract

A 5-year pet doe (unknown breed) was presented (~ 1 month after her expected day of kidding) with a history of vaginal discharge and fetal membranes hanging from the vulva. She was bright, alert, and responsive with an elevated heart rate and respiratory rate. Blood chemistry panel was unremarkable. Vaginal speculum examination was attempted; however, her vulva was 1 inch in length (dorsal to ventral commissure) making it very hard. Transabdominal uterine ultrasonography revealed no fetus and uterus had an irregular echogenicity. A small fetus was identified via transrectal uterine ultrasonography. Decision was to perform cesarean surgery (left flank approach). A mummified fetus was extracted from the left uterine horn.

**Keywords:** Goat, fetus, mummification, cesarean surgery

## Background

In utero death of a fetus after bone development[1] (without undergoing autolysis and expulsion) becomes a mummy. Mummification is possibly due to dry and hypoxic uterine environment that alters normal autolytic process. Apparently, dehydration is a major factor that prevents bacterial survival. Mummification has been reported in monotocous and polytocous species,[2] mostly in the latter.[1] Not much is reported in goats. Diagnosis, treatment, and causes are presented.

## Case presentation

A 5-year pet doe (unknown breed) was presented (~ 1 month after her expected day of kidding) with a history of vaginal discharge and fetal membranes hanging from the vulva. Doe was recently adopted with an unknown history regarding herd status, disease prevalence, and management. Physical examination revealed elevated heart rate (130/beats per minute [bpm]) and respiratory rate (30/bpm) with decreased rumen contractions. Doe had a hypoplastic vulva. Vaginal palpation revealed an enlarged and firm urethra, reddish brown mucoid discharge, and fetal membranes. No vaginal lacerations or other abnormalities were noticed. Cervix felt closed on digital examination. Vaginal speculum examination was attempted; however, her vulva was 1 inch in length (dorsal to ventral commissure) making it very hard and furthermore proper size speculum was not available. Transabdominal uterine ultrasonography revealed no fetus and uterus with irregular echogenicity. A small fetus was identified via transrectal uterine ultrasonography. There were bony structures (appearance of thorax), but no heartbeat was detected. Differential diagnoses were fetal mummification or maceration. Prostaglandin treatment was not considered (may not expel all fetal and bacterial content). Owners elected surgical option. An abortion panel (to determine fetal cause of death and mummification) was offered, but owners declined. Prior to cesarean surgery, doe was given subcutaneous ceftiofur (6.6 mg/kg) and thiamine (20 mg/kg daily), intravenous flunixin meglumine (1.1 mg/kg) and butorphanol (0.1 mg/kg). Thiamine was given because doe was anorexic, and as part of regular supportive care. During surgery, patient was given intravenous lactate Ringer's (140 ml/h). A mummified fetus with small partial placental membranes (Figures 1 and 2) was removed. Uterus was lavaged and abdomen was infused with 1.5 ml of penicillin G procaine (10,000 IU/kg), and intravenous morphine (0.1 mg/kg) was given after surgery. The patient was quiet, alert, and responsive the morning after the procedure. The patient had no interest in eating throughout the night, and there was no rumination.

## Outcome

The patient was sent home the next day because of positive recovery after surgery. The patient was prescribed oral meloxicam (15 mg once a day for 7 days). Owners were advised to observe her closely (placing her in a dry place separate from herd) and ensure that her appetite remained stable and that there was no sign of bloody feces (due to nonsteroidal

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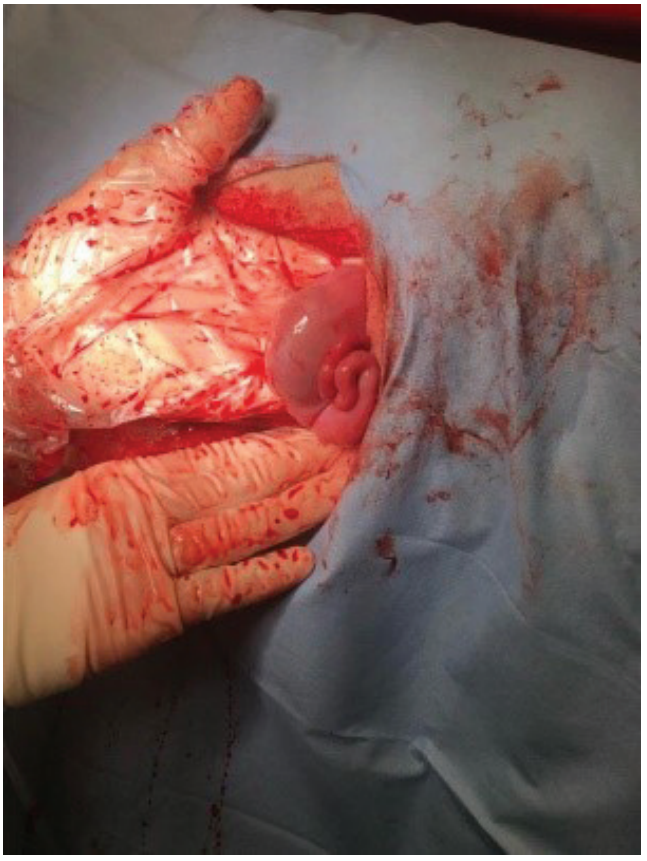

**Figure 1.** Mummified fetus in uterine horn

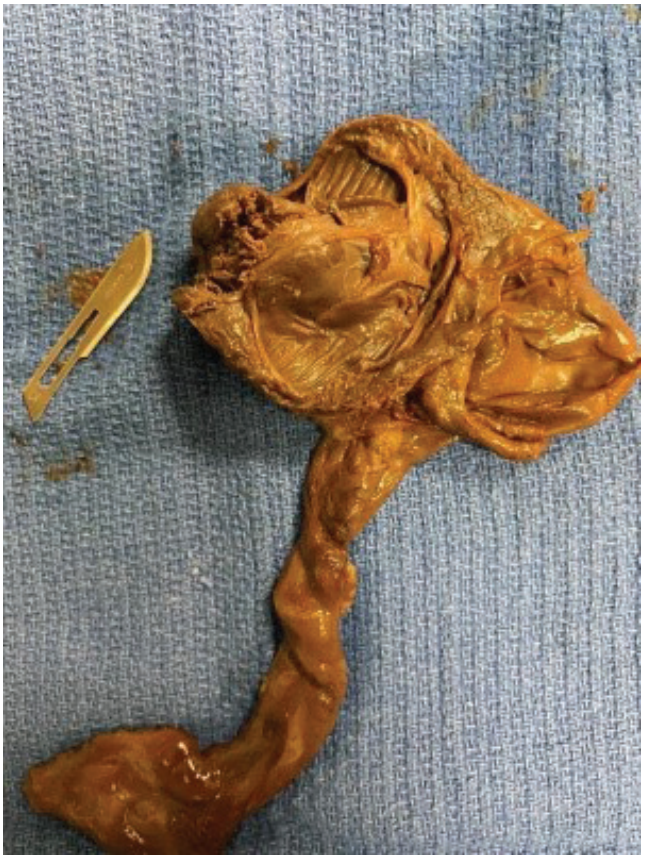

**Figure 2.** Mummified fetus

antiinflammatory drug treatment); instructed to observe for muscle fasciculations, ruminations, diarrhea, inappetence, abdominal distention, and lethargy; and to watch for redness, heat, swelling, pain, and discharge.

## Discussion

Fetal mummification occurs in animals when a series of factors are met in a certain time and order. It is most often observed in animals that are polytocous compared to monotocous species.[1] In pigs there is a tendency for genetic predisposition.[3] In small ruminants, infectious agents have been the prominent cause. Majority of diseases that cause mummification affect fetal membranes and future fertility. Antiinflammatory agents are used.[4] Not much is known about the specific viability issues since does are commonly culled. Infectious diseases responsible for mummification are toxoplasmosis and chlamydophila infection, Border disease, and coxiella.[5] Additionally, uterine torsions can result in mummification.[6] Viral infections in small ruminants do not damage the uterus whereas bacterial infections with resulting fetal maceration[7] have a poor prognosis for future breeding. Although prostaglandin $F_{2a}$ treatment is recommended for goats similar to cattle,[8] it was not attempted in this case.

## Learning points

- Fetal mummification in goats is a rare and uncommon occurrence with unknown etiology
- Treatment option is surgical approaches to excise the fetus
- Prostaglandin $F_{2a}$ treatment is not always recommended

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