Signalment: Two ovine fetuses (crown to rump length of 38 cm) and a portion of placenta were submitted.

History: On this farm, several ewes had aborted at spring lambing. Six more ewes had aborted during the fall, including the ewe associated with the submitted fetuses.

Gross Findings: Dissecting between the intracotyledonary spaces of the placenta were branching, multifocal to coalescing thickened, white, rough areas.
Signalment: Two ovine fetuses (crown to rump length of 38 cm) and a portion of placenta were submitted to the Oklahoma Animal Disease Diagnostic Laboratory.

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Gross Findings: Dissecting between the intracotaledonary spaces of the placenta were branching, multifocal to coalescing thickened, white, rough areas.

Microscopic Findings:
Chorioallantois: Transmurally and diffusely affecting the chorioallantois and infiltrating the walls of the placental vessels is a marked inflammatory infiltrate admixed with abundant cellular debris and large numbers of intra and extracellular bacteria. The chorionic surface is diffusely disrupted by extensive necrosis of the trophoblasts and large adherent clumps of necrotic cellular debris, bacteria, and neutrophils. Large numbers of bacteria often markedly distend the cytoplasm of the trophoblasts. The underlying placental stroma is markedly expanded by edema, necrotic cellular debris, fibrin, numerous degenerate neutrophils, and small numbers of lymphocytes, plasma cells, and macrophages. The architecture of the stromal vessel walls are similarly disrupted and expanded cellular debris, fibrin, and degenerate neutrophils. Occasional vessels contain luminal fibrin thrombi. Along the allantoic surface, there is a thick layer of necrotic cellular debris admixed with degenerate neutrophils and fibrin.

Morphologic Diagnosis:
Chorioallantois: Severe, multifocal to locally extensive, transmural necrosuppurative placentitis with vasculitis and intratrophoblastic bacteria

Discussion:
Common causes of abortion in small ruminants are regionally variable and often include infection with *Chlamyphila* spp., *Toxoplasma gondii*, *Campylobacter* spp., and *Coxiella burnetti*. In addition to routine gross and histopathological analyses, routine bacterial cultures, serology, PCR, and immunohistochemistry (IHC) are used to determine the aetiology of the abortion.
The presence of bacterial organisms within the cytoplasm of the trophoblasts in this case is a key histologic feature that helps to reduce the number of possible aetiologies. Differentials for this pattern of placentitis are infection with *Brucella* spp., *Chlamydia* spp., and *Coxiella burnetti*. Other organisms that can be present within the cytoplasm of trophoblasts include *Toxoplasma gondii* and *Candida* spp.; though they are morphologically distinct from the bacterial organisms on routine H and E sections.

In this case, aerobic cultures of the placenta did not yield any significant organisms, making *Brucella* spp. infection unlikely. Placenta was also cultured on *Campylobacter* selective plates and no *Campylobacter* spp. were isolated. Serology on fetal blood for blue tongue virus and *Toxoplasma gondii* was negative. *Leptospira* spp. serology on fetal blood resulted in a titer of less than or equal to 200 for all serovars. Pestivirus was not detected with fluorescent antibody in the spleen and lung. Fresh placenta was submitted to the Colorado State University for *Chlamydia* spp. PCR which was negative. The block was submitted to the California Animal Health and Food Safety Laboratory for *Coxiella burnetti* immunohistochemistry (IHC) as previously described. The intratrophoblastic organisms were immunoreactive for *C. burnetti*. Given these test results, the placentitis was likely related to *C. burnetti* infection.

*Coxiella burnetti* is the causative agent of Q fever. Because Q fever is a highly infectious zoonotic disease, it must be handled with biolevel 3 safety procedures and routine cultures are discouraged. In ruminants, *C. burnetti* localizes in the mammary glands and reproductive tract, often resulting in placentitis and subsequent abortion. Grossly, the intercotyledary areas are thickened and white with a “leathery” appearance. Histologically, there is a necrotizing placentitis of which the intratrophoblastic organisms are a key feature. Vasculitis is typically not associated with Q fever, though it has been reported.

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References:

2. Moore JD, Barr BC, DM Daft, O'Connor MT. Pathology and diagnosis of *Coxiella burnetti* infection in a goat herd. 1991 28:81-84
