

Case #4

Tissue from a goat. Three, third-trimester goat fetuses and two placenta from a "Spanish" (crossbred) goat were presented. Most losses in the herd this season were from weak kids.

Description: Case T04-B006

Placenta (Chorioallantois): The section includes cotyledon and intercotyledonary placenta. Diffusely the placenta is edematous. Locally extensive areas of especially the intercotyledonary placenta has the epithelium replaced by a coat of degenerative and necrotic neutrophils with a mild to moderate, pleocellular subjacent infiltrate. Trophoblasts are distended by basophilic, $< 1\mu\text{m}$ organism (Gram-negative bacteria).

Morphologic Diagnosis: Subacute, necrosuppurative placentitis.

Etiology *Coxiella burnetii*

Note: The organisms do not stain well with the modified PVK stain (used for Chlamydia diagnosis), but sections stained specifically for *Coxiella burnetii*.

Q-Fever was initially described in abattoir workers in Queensland, Australia in 1935. Initially called Query Fever, it is a world-wide disease currently gaining prominence as a bio-terrorism organism because of its zoonotic potential. In humans it causes fever, placentitis, meningoencephalitis, pericarditis/endocarditis, hepatitis, cholecystitis, atypical pneumonia, and myositis. It shares, with organisms like Legionella and Brucella, the ability to proliferate intracellularly in phagolysosomes. It is resistant to killing in nature, and although transmission from placenta, placental fluids or infected animals is common, it can be aerosolized in dust as well. It is an occupational hazard of veterinarians, meat industry workers, and shepherds. It can infect a variety of domestic and sylvatic species including amoeba! In nature, the highest incidence of seropositivity is in goats.

Several groups of bacterial organisms can fill trophoblasts like we see in this case, including: Brucella spp, Campylobacter spp, Salmonella spp., and Chlamydia sp.. Electron microscopy shows that the distended phagolysosome forms a parasitophorous vacuole-like structure. The organism is internalized by a microfilament-dependant parasite directed endocytosis. It grows slowly and causes little cytopathic effect in vitro. It has a pleomorphism with large and small cell variants. It is thought that it may form a spore-like particle that could explain its environmental resistance. An interesting bug!!!

1. Gluckman SJ: Q Fever and Trench Fever, Clin Dermatol 14:283-7, 1996.
2. Heizen RA, Hackstadt T, Samuel JE: Developmental biology of Coxiella burnetii. Trends Microbiol 7:149-154, 1999
3. Maurin M, Raoult D: Q Fever. Clin Microbiol, Rev 12:518-553, 1999.
4. Samperi M, Font B, Font J, Sanfeliu I, Segura F: Q fever in adults: Review of 66 clinical cases. Eur J Clin Microbiol Inf Dis 108-10, 2003.