

Clostridial Infection of the Proventriculus and Ventriculus in Broiler Breeder Pullets

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Abstract

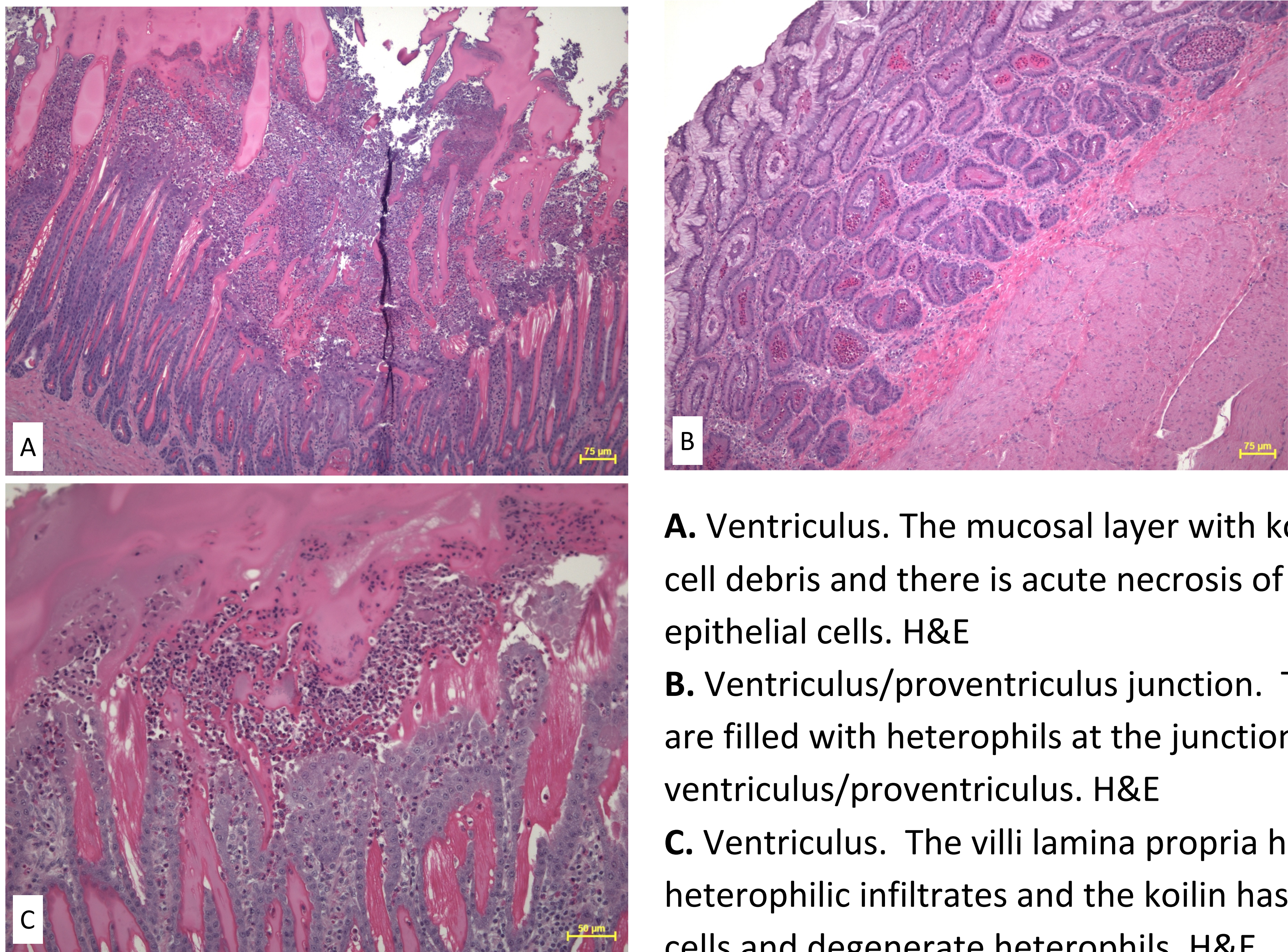
Several broiler breeder pullet flocks of varying ages at a single company had increased mortality. The service technicians noticed a correlation between mortality and significant gross gizzard lesions. The technicians noted that copper sulfate administration in the water reduced the mortality. A flock of 18 week old 308AP pullets with elevated mortality was identified to have lesions consistent with the reports of the field technicians. On gross examination, the gizzard lesions were similar to lesions reported by the technicians; severe ulcerations were noted at the junction of the proventriculus and ventriculus. Gizzards were collected for histopathology and anaerobic microbiology. *Clostridium perfringens* was isolated from the gizzard, and gram positive and negative bacteria were noted in and around the lesions utilizing Brown and Hopps stain. The *C. perfringens* was alpha toxin positive and netB negative by PCR. Meat and bone meal was a suspected cause of contamination; therefore meat and bone meal samples from the feed mill were submitted for anaerobic culture. Several of the samples were positive for *C. perfringens* and *C. bifermentans*. The *C. perfringens* was positive for alpha toxin and negative for netB. Changes were made to meat and bone meal processing and delivery; the incidence of the lesions was significantly reduced in the complex.

Microbiology and Molecular Results

Sample	C. perfringens	α-toxin	netB toxin
Gizzard House 1	2/2	2/2	0/2
Gizzard House 2	4/4	1/1	0/1
Meat and Bone Meal Sample	Clostridium	α-toxin	netB toxin
Truck 80	1/1 <i>C. perfringens</i>	1/1	0/1
Truck 86	1/1 <i>C. bifermentans</i>	--	--
Bin 6	1/1 <i>C. perfringens</i>	1/1	0/1
Bin 6	1/1 <i>C. perfringens</i>	Not tested	Not tested
	1/1 <i>C. bifermentans</i>	--	--
	1/1 <i>C. barattii</i>	--	--
Auger 6	1/1 <i>C. perfringens</i>	1/1	0/1
Auger 7	1/1 <i>C. perfringens</i>	1/1	0/1
	1/1 <i>C. difficile</i>	--	--



Gross and Microscopic Appearance



Conclusion

The severe lesions in the proventriculus and ventriculus contained gram-positive, rod-shaped bacteria. The same samples were culture positive for several species of *Clostridium*. In a continuation of the investigation, several meat and bone meal samples also tested positive for *Clostridium* species. Both the ventriculus and the feed ingredient samples were positive for α-toxin positive, NetB toxin negative *C. perfringens*. The prevalence of a toxin-producing *C. perfringens* in both meat and bone meal and the ventriculus is suggestive of the ingredient as a source. *Clostridium perfringens* is a causative agent for necrotic enteritis in chickens. *Clostridium bifermentans* is generally considered non-pathogenic, but has been rarely recovered from human infections. *Clostridium baratti* is associated with botulism in humans. *Clostridium difficile* is commonly isolated from the intestines of many species. It can be asymptotically carried but can be a cause of severe diarrhea and colitis in humans. More work is needed to prove Koch’s postulate, but there was a link between the inclusion of contaminated feed ingredients and the lesions.

References

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