

Correlation of rectal biopsy findings with mucosal changes elsewhere in the equine intestine

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Background

Rectal biopsy is commonly used for diagnosis of equine inflammatory bowel disease. However, there are few studies on how rectal inflammation correlates with inflammation in other parts of the equine intestine.

Conclusions

This small pilot study indicates that 1) mild or absent proctitis does not exclude severe large intestine inflammation, 2) mucosal changes in the small colon may better represent changes in equine large colon, and 3) submucosal eosinophils in rectal biopsy may better indicate severe large intestine inflammation than rectal mucosal inflammation.

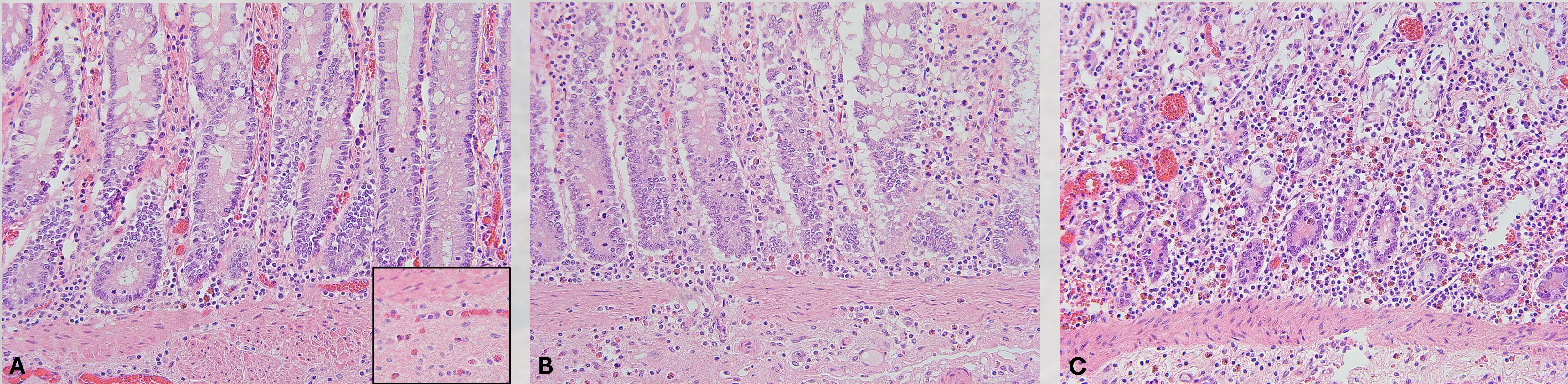


Figure 1. An example of the scoring system from samples of horse 2. HE stain, 20x magnification. A: A mild diffuse chronic eosinophilic proctitis. Insert (40x): Clustering of eosinophils in the submucosa. B: Moderate diffuse chronic eosinophilic colitis in the small colon. C: Severe diffuse chronic eosinophilic colitis in the ventral colon.

Table 1. Scoring system for evaluation of inflammatory type and severity

Cell type	Normal	Mild	Moderate	Severe
Eosinophils:				
• Mucosal (/HPF)	<10	10 to 20	20 to 40	>40
• Submucosal	Singular	Scattered clusters	Regular clusters	Diffuse
Lymphocytes and plasma cells (between crypts)				
	2 to 3	3 to 5	5 to 10	>10
Neutrophils (/HPF)				
	not present	<5	5 to 10	>10

HPF = high power field, visible with 40x objective, 10x ocular and field number 22, equaling 0.237mm².

Materials & Methods

Histological samples from jejunum, ventral colon, small colon, and the routine rectal biopsy site were obtained from 20 horses, with or without intestinal signs, during routine autopsy. Samples were stained with HE and categorised according to the scoring system outlined in Table 1. Statistical association between sites and severity were analysed using Fisher’s exact test (significance level $p<0.05$).

Results

Increased rectal submucosal eosinophils ($p=0.028$) and moderate/severe inflammation of the small colon ($p=0.038$) correlated with severe large colon inflammation. However, moderate or severe inflammation in either rectal mucosa ($p=1.00$) or small intestine ($p=1.00$) did not correlate with large colon inflammation of any severity.

Table 2. Signs and histopathological result of cases

Case	Signs/findings	Jejunum	Ventral colon	Small colon	Rectum	Rectal SM EOS
1	colonic torsion	mild EOS	mild EOS	mild EOS	mild EOS	
2	colonic torsion + impaction	mild EOS	severe EOS	moderate EOS	mild EOS	yes
3	ventral colon impaction	moderate EOS	severe EOS	moderate EOS	moderate NEU	yes
4	chronic enteral diverticule	moderate LPC	moderate EOS	mild EOS	mild LPC	
5	acute enteric perforation	mild EOS	severe EOS	moderate EOS	mild EOS	yes
6	RDD	mild EOS	moderate EOS	mild EOS	normal	
7	enteric volvulus	mild LPC	severe EOS	moderate EOS	mild LPC	
8	ileus, colonic displacement	severe EOS	severe EOS*	moderate EOS	mild EOS	yes
9	gastric rupture, sand, RDD	mild EOS	moderate EOS	mild EOS	normal	
10	colic surgery	normal	moderate EOS	mild EOS	normal	
11	sand eater	mild LPC	severe EOS	mild EOS	moderate EOS	yes
12	colic surgery	mild EOS	mild EOS	mild EOS	moderate LPC	
13	colic, sand, RDD	mild LPC	moderate LPC	mild LPC	mild LPC	
14	meningoencephalitis	normal	normal	normal	normal	
15	lameness, intestinal parasites	severe EOS	severe EOS	severe EOS	moderate EOS	yes
16	lameness, intestinal parasites	mild EOS	severe EOS	moderate EOS	mild LPC	
17	osteoarthritis	moderate EOS	severe EOS	severe EOS	moderate EOS	yes
18	RDD	mild EOS	severe EOS	moderate EOS	normal	
19	impaction, RDD	moderate LPC	severe EOS, mod. LPC	moderate LPC	normal	
20	hemorrhagic enteritis, sand	mild EOS	moderate EOS	moderate EOS	mild EOS	yes

SM EOS = submucosal eosinophils. EOS = eosinophilic inflammation. LPC = lymphoplasmacytic inflammation. NEU = neutrophilic inflammation. RDD = right dorsal displacement. * = Ventral colon substituted with dorsal colon in this case because of severe autolysis.