

Phlegmonous Colitis Associated with Advanced Liver Disease: Case Report and Novel Radiological Signs

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A 44-year-old-female with end-stage liver disease (Child C, MELD 31), and cirrhosis secondary to hepatitis B, C and autoimmune hepatitis was admitted to the medical ICU with symptoms of shock and extensive cellulitis of the lower abdomen. Blood cultures supported clinical suspicion of septic shock related to *E. coli* bacteremia. The patient quickly developed hypotension refractory to fluid management and was placed on IV pressors and intubated. To better evaluate for a source of the septicemia, CT imaging of the abdomen and pelvis was performed on day 2 showing worsening of previously noted edema of the colon at time of admission (not shown) that was new from a baseline examination performed 4 months prior. The colonic wall edema extended from the proximal ascending to mid descending colon with the enhancing mucosa appearing intact (Figs. 1–4). Given her history of frequent and broad-spectrum antimicrobial therapy and the CT findings above, the possibility of pseudomembranous

colitis was considered likely and empiric treatment was started.

Despite surgical debridement of the cellulitic area, and continuing anti-microbial therapy, the patient's condition continued to deteriorate and she expired several days later. On autopsy, there was diffuse mild edema throughout the entire colon with more focal involvement in the cecum and ascending colon with nodular collections of neutrophils in the submucosa with intact overlying mucosa. These findings were not consistent with a pseudomembranous colitis and are characteristic of phlegmonous colitis (PC) – a clinical entity that has not been widely reported, especially in English language journals and probably more common than previously thought.¹⁻³ Of particular note were the CT findings of intact mucosa overlying extensive colonic wall edema which corresponds to the unique pathology of this entity in which the mucosa remains intact in the presence of apparently massive bacterial translocation.⁴



Figure 1. CT Coronal reconstruction from abdominal CT taken 4 months prior to episode. Note presence of ascites secondary to advanced liver disease and normal appearance of ascending colon.



Figure 2. Coronal reconstruction of IV contrast enhanced CT study taken on day of ER admission demonstrating mild pericolonic inflammatory changes adjacent to the ascending colon (white arrow).

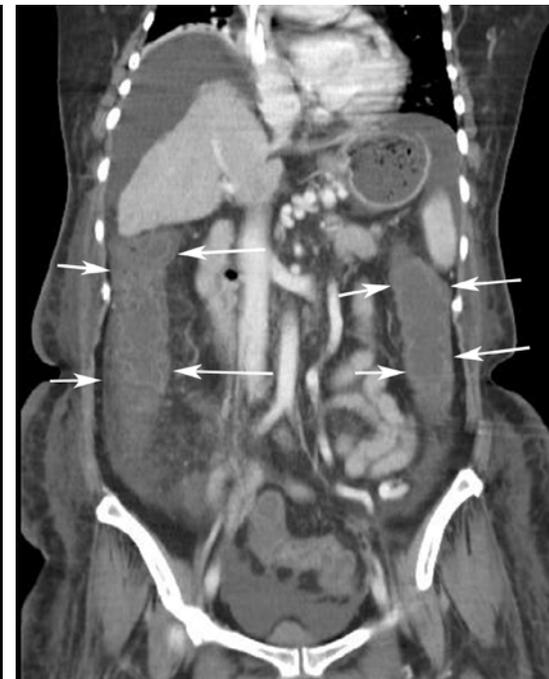


Figure 3. Coronal reconstruction of CT study taken on day 2 post admission taken in a plane posterior to Fig. 2 clearly demonstrating intact submucosa in both the ascending and descending colon with pronounced submucosal edema (white arrows).

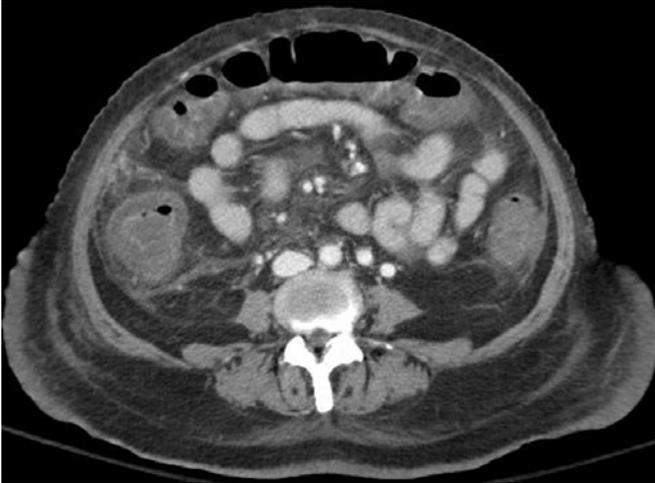


Figure 4. Axial CT taken on day 2 post-admission demonstrating extensive pericolic fat stranding but relatively normal appearing small bowels collapsed in some areas.

DISCUSSION

Although there are numerous radiological findings employed to help distinguish among benign and malignant conditions of the colon, clinical presentation remains the primary guide to developing differential diagnoses based on radiological evidence.⁵ There are established associations that increase the likelihood of specific diagnoses when given a set of clinical observations. For instance, typhlitis in the context of an immunosuppressed patient,⁶ pseudomembranous colitis with extensive antibiotic therapy⁷ or inflammatory bowel disease in the presence of arthritis or pyoderma.⁸ These associations are well known and have been incorporated into the standard armamentarium of gastroenterological radiology; however, less commonly known is the association between chronic hepatic disease and phlegmonous colitis (PC).^{2,9} Unfortunately, nearly all the data found in support of this has been through post-mortem analysis of tissue, and there has been a dearth of reports of PC being diagnosed prior to expiration.^{4,10-11} As PC was not identified in any of these patients prior to death, it is apparent that this entity has gone unrecognized by clinicians treating these patients. Therefore it is of immediate clinical

importance in the management of these patients that PC be considered in the differential diagnoses when these patients present with evidence of septicemia.

RADIOLOGICALLY SIMILAR ENTITIES

As was the case here, radiological evidence of increasing thickening of the colon wall in the context of broad-spectrum antibiotic use and diarrhea often elicits a differential diagnosis of pseudomembranous colitis (PMC). In a study by Fishman et al,¹² it was shown that abnormal bowel wall most often involved the entire colon but also can manifest more regionally in just the sigmoid or ascending/transverse colon. There is a similar appearing entity which is more specifically associated with advanced liver disease and portal hypertension – portal hypertension colopathy (PHC). In a study by Ito et al,¹³ there was a 66% incidence rate of PHC in participating cirrhotic patients not correlated with varices. Like PMC, such abnormalities often manifest themselves on contrast studies; however, PHC will also demonstrate lesions disrupting the mucosal layer that remains intact in PC.¹⁴ Although these entities may resemble PC and share a predisposing factor (liver disease which can result in both portal hypertension and increased infectious susceptibility leading to increased antibiotic use), they should result in different enhancement patterns and endoscopic exam due to the distinct natural history of these entities. Given previous recommendation by other authors, colonoscopy, contrast studies (with special attention to the arterial phase¹⁵) or both might be warranted when presented with a rapidly deteriorating patient with ambiguous radiological colon disease.

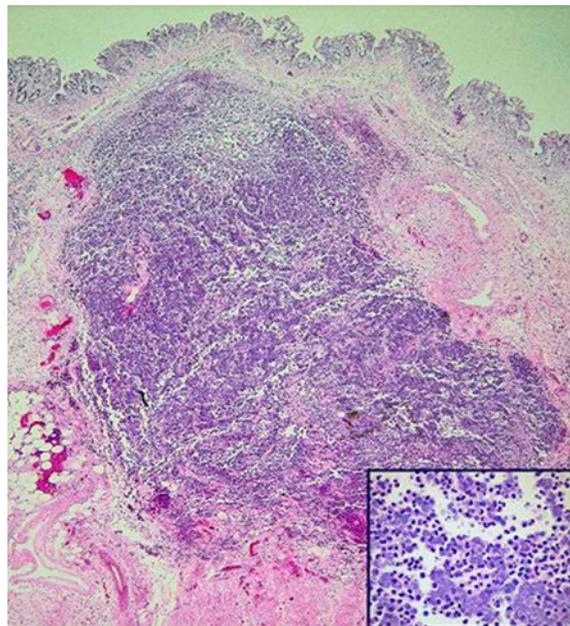


Figure 5. Intact mucosa with underlying dense cellular infiltrate; Insert: High power view of cellular infiltrate showing mostly neutrophils.



Figure 6. Gross photograph of segment of large bowel showing intact mucosal surface.

TREATMENT IMPLICATIONS

PC is a rapidly fatal condition unless treated in a timely manner. As surgical intervention is only indicated in advanced/perforated cases of PMC¹⁴ and almost never in PHC¹⁶, aggressive treatment of ambiguous disease with surgical exploration is probably not warranted unless there is evidence to raise the suspicion of PC. Surgical treatment, once PC is identified, would be very similar to the surgical treatment of PMC and entail performing a subtotal colectomy followed by vancomycin treatment (pulsed or non-pulsed). Given the time-critical nature of PC intervention, rapid endoscopic examination is probably advisable when given the previously described radiological findings in end-stage liver disease (ESLD) patients. Such direct examination in the case of PC should reveal an intact submucosa without excessive hyperemia.¹⁶

CONCLUSION

Whatever the contribution of chronic hepatic disease is to phlegmonous colitis, it appears to be more common than previously thought. We propose with CT findings of colitis in the cecal region, especially in the context of chronic hepatic disease, that PC be included in the differential diagnoses. The literature demonstrates that PC has been uniformly overlooked even when the clinician is presented with evidence of colonic involvement in the critically ill patient with ESLD. Despite lack of established diagnostic criteria for radiological identification of PC,¹⁷ we believe the diagnosis can be suggested in the appropriate clinical setting based on the CT findings we have described.

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