Beyond Low Flow: How I Manage Ischemic Colitis

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Colitis

THE BIG PICTURE

Colon ischemia (CI) is a common disease diagnosed in 16–24% of patients presenting to the hospital with acute lower gastrointestinal bleeding (1) and accounting for ~16–18 per 100,000 hospital admissions (2,3). Indeed, it is the most common ischemic disorder of the GI tract, and it and infectious colitis are the most common colitides seen in patients older than 65 years of age. Therefore, CI is important to keep in mind whenever you are consulted on an older person with bloody diarrhea, diarrhea, rectal bleeding, or abdominal pain. We prefer the umbrella term “colon ischemia” instead of “ischemic colitis” since an inflammatory phase of CI is not documented in all patients, and thus, CI is a more accurate term. The main questions we ask ourselves when approaching a patient with possible CI are: i) What are the symptoms; ii) What else could it be; iii) Should computed tomography (CT) and/or colonoscopy be performed; iv) How sick is the patient; v) Are antibiotics needed; vi) Does the patient need a surgeon?

WHAT ELSE COULD IT BE?

Patient history, serologic testing, imaging, and colonoscopy are used to differentiate CI from other diseases with similar presentations. New-onset Crohn’s disease and ulcerative colitis are unusual in the elderly and typically present with more chronic symptoms, weight loss, distal colon involvement, and colonic biopsies that show signs of acute and chronic inflammation. Infectious colitis is differentiated by history of recent travel or food intake that placed the patient at risk with stool culture and examination for parasites potentially confirming etiology. Escherichia coli O157:H7 should be tested for in patients with rectal bleeding, and is an infectious cause of CI. Colonic adenocarcinoma and other potential obstructions, e.g., fecal impaction may provoke proximal CI and need to be excluded. Radiation proctitis should be suspected by history and has a characteristic spiraling telangiectasia appearance.

SHOULD CT OR COLONOSCOPY BE PERFORMED?

Distinguishing CI from other causes of pain, rectal bleeding, and diarrhea can be challenging. CT scan with intravenous contrast is the best modality to detail the distribution and phase of disease and provides important insight into its severity: portal venous gas (Figure 1), pneumatosis linearis (Figure 2), and megacolon indicate severely diseased colon.

When the CT scan and clinical presentation leave the diagnosis in doubt, colonoscopy is performed. We prefer to insufflate the colon with carbon dioxide rather than room air to minimize the reduction in colonic blood flow that results from elevation in intraluminal pressure (5). Colonoscopy is the most useful test to diagnose CI by providing direct observation of the mucosa, detailing disease distribution and enabling biopsy confirmation (4). CI has a range of findings including erythema, ulceration, and subepithelial hemorrhage (6), but gangrene and the “Single Stripe Sign,” a linear ulceration along the longitudinal axis of the left colon, are the only colonoscopic findings that reliably differentiate CI from other diseases (Figures 3 and 4) (7).

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HOW I APPROACH IT

When suspicion for CI is high, we use physical examination, serology, imaging, and colonoscopy not only to determine disease severity, but to guide management (6). Hypotension or tachycardia raise concern for poor-outcome. Blood urea nitrogen, hemoglobin, lactic acid dehydrogenase, serum sodium, and white blood cell count are used to assess severity (6). As noted above, a major consideration is the segmental distribution of the ischemic process. Patients with IRCI are at greater risk for 30-day mortality and/or colectomy than CI involving any other region of the colon (8). IRCI also may be associated with acute mesenteric ischemia (9). In all cases of IRCI we review the original CT and recommend CT-angiography (CTA), magnetic resonance angiography (MRA), or mesenteric angiography to assess SMA patency, compromise of which would mandate immediate intervention (9). Patients with an “acute” abdomen or CT scan findings of fulminant colitis, portal venous gas, pneumatosis linearis, or megacolon are at greatest risk for mortality (6).

ARE ANTIBIOTICS NECESSARY?

Disease severity guides our management: we classify CI as mild (e.g., typical symptoms of CI with none of the risk factors associated with poor-outcome); moderate (e.g., suspected CI

Figure 1. CT scan showing portal venous gas in a patient who presented with severe colon ischemia.

Figure 2. CT scan showing pneumatosis linearis of the ascending colon and small bowel dilation in a patient with SMA obstruction.

Figure 3. Colonoscopic image of the “Single Stripe Sign,” a linear ulceration along the longitudinal axis of the colon.

Figure 4. Colonoscopic image showing mucosal necrosis (e.g., gangrene) in a patient with severe colon ischemia after aortic aneurysm surgery.
with 1–3 of the following: male gender, hypotension, tachycardia, abdominal pain without rectal bleeding, blood urea nitrogen >20 mg/dl, Hgb<12 g/dl, lactate dehydrogenase >350 U/l, serum sodium<136 mmol/l, white blood cells >15×10^9/l; or severe (e.g., >3 of the risk factors for moderate disease, peritoneal signs, pneumatosis linearis, or portal venous gas on CT, gangrene on colonoscopy, or pan-colonic or IRCI disease distribution on colonoscopy or CT). If patients have “mild” disease, we treat with conservative measures including nil per os, intravenous fluids, balancing electrolytes, and optimizing cardiac status; any possible underlying causes are addressed. Comprehensive review of all medications is a key part of our assessment and consideration is made for discontinuing any associated with CI (e.g., constipation-inducing medications, immunomodulators, and illicit drugs) (6). After a single episode of CI, we do not typically evaluate for hypercoagulability, but we do so after multiple episodes.

When a patient is classified as having “moderate” disease, we are more aggressive with our therapy. If there is IRCI, we consult with the surgical service and image the mesenteric vasculature to exclude potentially causative obstructive lesions of the SMA or its branches; this can be done by CTA, MRA, or traditional angiography, the latter also having therapeutic potential. The presence of IRCI and failure to be able to clinically differentiate CI from acute mesenteric ischemia (AMI) are our only two reasons to image the colonic vasculature in patients with an index presentation of CI. This is because by the time of clinical presentation in cases of non-IRCI, the ischemic period has resolved and colon blood flow has already normalized. Clinical expression of CI represents a combination of ischemia and reperfusion injury. If the disease distribution is other than IRCI, and the patient does not have a “surgical abdomen”, we practice conservative management. There are no studies in humans addressing antibiotics for the treatment of CI and justification for their use is extrapolated from mouse models of acute vascular occlusion that show antibiotics minimize bacteremia and improve outcome. In all patients with moderate or severe disease, we use a combination of an anti-anaerobe (e.g., metronidazole or clindamycin) with Gram negative coverage (e.g., fluoroquinolone, aminoglycoside, third generation cephalosporin).

DOES THE PATIENT NEED A SURGEON?

Patients with “severe” disease require the same conservative measures described above, antimicrobial therapy, and consultation with our interventional and surgical colleagues. We transfer these patients to the intensive care unit, obtain immediate surgical consultation, and image the splanchnic vasculature as soon as possible. Identification and treatment of any contributing underlying disease process is crucial. Time is of the essence, so prompt recognition of severe disease is very important. If there is a lag in recognition of this severe process, the likelihood of mortality increases significantly.

SUMMARY

CI is a common and usually benign disease, although prognosis is related to the segment of colon involved as well as the severity of the process. Attention to the site of involvement, basic laboratory data, CT, and colonoscopic findings minimizes the risk for poor-outcome. By triaging patients according to these variables, we can determine who should receive conservative therapy and who warrants more aggressive intervention, including antibiotics and surgical consultation.

CONFLICT OF INTEREST

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REFERENCES

1. True statements regarding colon ischemia include
   a. Bleeding is always present
   b. Pain is the predominant symptom in right sided ischemia
   c. Main symptom in left sided ischemia is bleeding, pain is usually a minor complaint
   d. Right sided colon ischemia has a more benign course compared to left sided

2. Management recommendations for all patients with colon ischemia include all of the following
   a. Broad spectrum antibiotics
   b. CTA, MRA or angiography to evaluate mesenteric vasculature
   c. NPO, IV fluids, correction of electrolytes and observation
   d. Evaluation for a hypercoagulable state

3. Which of the following are signs or symptoms of more severe disease
   a. amylase >350 IU
   b. pain without bleeding
   c. stripe sign on endoscopy
   d. LDH >350 U/L

True or False

4. Infection with E. coli O157:H7 may be a cause of colon ischemia

5. CT scan is not helpful in the evaluation of patients with suspected colon ischemia

6. Single stripe sign on endoscopy is a strong predictor of the presence of colon ischemia