Acute flare of ulcerative colitis resulting in perforation and managed with colectomy: Case report and literature review

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Abstract

We present the case of a 34 year–old male with a previous diagnosis of ulcerative colitis, who presented with an acute flare resulting in bowel perforation and pneumo–peritoneum ultimately requiring total colectomy. Acute presentation of ulcerative colitis is a potentially life–threatening medical emergency requiring immediate medical treatment to induce disease remission and address any superimposed infections. Complications of acute ulcerative colitis include bowel perforation and toxic megacolon, particularly after colonoscopy. Extra precautions should be taken when planning colonoscopy for these patients to reduce the risk of such perforation. We outline the diagnosis, management, and complications associated with acute flares of colitis.

Patient History

A 34 year–old male with a history of pan–ulcerative colitis presented to the hospital after 10 weeks of diffuse abdominal pain, fevers, chills, nausea, emesis, and approximately 20 loose, bright red, bloody, bowel movements per day. His ulcerative colitis was diagnosed in 2012 and at the time of admission was managed with infliximab (Remicade) every six weeks and daily prednisone. He reported one prior flare of colitis a year ago, which was treated medically. At admission, his vitals were stable and he was afebrile. His abdomen was mildly diffuse and tender. There were no signs of peritonitis.

At admission, a sigmoidoscopy was performed reaching 35 cm from the anal verge. The mucosa was very friable and deep ulcerations were present, indicating a Mayo Grade of 3 (Mayo Grade indicates severity of ulcerative colitis from 0 to 3, based on endoscopic findings). An abdominal X–Ray at that time demonstrated features of colitis with a maximal diameter of 7.2 cm noted at the transverse colon. The patient's C–reactive protein (CRP) was 362 mg/L at this time. He was subsequently started on IV methylprednisolone and IV ganciclovir (Cytovene), as there was initial concern of cytomegalovirus (CMV) infection due to the presence of mucosal ulcers.

The patient was admitted to hospital under the gastroenterology service. The patient's CRP decreased to 99 mg/L over the following week, but then peaked at 147 mg/L approximately three days later. During this time, he continued to have more than ten bowel movements per day. A repeat colonoscopy was performed the next day, and demonstrated extremely friable mucosa, loss of vascularity, deep ulceration, as well as possible pseudomembranes. Oral vancomycin was started to empirically cover for *Clostridium difficile* (*C. difficile*). Fecal studies and C. difficile toxin done at that time eventually resulted as negative.

The patient's symptoms failed to improve. A Computed Tomography (CT) scan was performed on the subsequent day. It demonstrated pan–colitis, diffuse colonic wall thickening, and a transverse colon full of gas, which was dilated to 7.5 cm. There was a large amount of intra–abdominal free air noted, mostly peri–hepatic. Trace amounts of free fluid were noted in the abdomen. The patient was then assessed by general surgery and taken to the operating room for a total colectomy. The procedure was uncomplicated and the patient was sent to recovery in stable condition.

Pathology Findings

The gross pathology specimen demonstrated diffusely friable mucosa with deep ulcerations. Areas of hemorrhagic tissue were apparent in the ascending and transverse colon. The transverse colon was dilated at approximately 7.5 cm while the rest of the colon was of normal diameter.

Microscopic examination demonstrated friable tissue with areas of hemorrhage and signs of chronic inflammation. However, no CMV inclusion bodies or pseudomembranes were identified.

Discussion and literature review

Ulcerative colitis is a subcategory of inflammatory bowel disease affecting several million people annually.[1] At this point in time, the exact cause of ulcerative colitis remains unknown, and is likely due to a combination of environmental and genetic factors.[2] Any patient presenting with constant, bloody stools, abdominal pain, and distention should raise suspicion for ulcerative colitis. An appropriate diagnosis of ulcerative colitis is dependent on ruling out Crohn's disease and other causes of colitis.

The differential diagnosis includes infectious colitis, ischemic colitis, radiation colitis, intestinal tuberculosis, and inflammatory bowel disease, including Crohn's and ulcerative colitis.[3] After an appropriate history and physical exam, the workup consists of a standard blood count and inflammatory markers to assess for elevated leukocytes and erythrocyte sedimentation rate (ESR) or CRP. Stool studies including ova and parasites, gram stain, and culture should be used to rule out infectious causes. Plain radiographs may demonstrate mural thickening, and in more serious cases, thumbprinting. Double–contrast barium enema provides greater detail and may demonstrate ulcers and loss of haustral markings, but is contraindicated if there is risk of perforation, such as in acute colitis. CT scan of the abdomen would display similar findings to contrast enema but has limited sensitivity in early colitis. It is, however, very useful in ruling out other causes of colitis in the differential diagnosis.

If there are no signs or findings indicating infectious, ischemic,

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or radiation colitis, the workup may then focus in on inflammatory bowel disease. Initial serum studies may include p–ANCA and ASCA, which have been noted to be elevated in ulcerative colitis and Crohn's, respectively.[4] However, a high incidence of false positives prevents the use of these markers as final diagnostic tools. Abdominal imaging may demonstrate mesenteric fat stranding, thumbprinting, colonic dilatation, and with barium, the "string sign" in Crohn's disease.[5,6] Colonoscopy serves to assess the gross appearance of the colon, which may differ in ulcerative colitis and Crohn's. Biopsies for histopathologic analysis would also be taken during colonoscopy.

Ulcerative colitis demonstrates an inflamed colon limited to the mucosal layer. There could be associated loss of vascularity and ulceration. The lesions usually begin distally and progress proximally, in a continuous fashion. Crohn's would demonstrate transmural inflammation, with regions of inflammation separated by regions of normal colon, termed "skip lesions". Fistulas and abscesses may also be present. Histopathologic analysis of ulcerative colitis may reveal diffusely inflamed mucosa with associated crypt abscesses, micro–ulcerations, and inflammatory pseudopolyps. Crohn's disease may demonstrate focal areas of inflammation with associated granulomas. Histopathologic investigation may also reveal signs of superimposed infection such as pseudomembranes and CMV inclusion bodies. It should be kept in mind that microscopic analysis of inflammatory bowel disease is imperfect and it is not always possible to differentiate between Crohn's and ulcerative colitis. Ultimately, differentiation of ulcerative colitis from Crohn's depends on a combination of history and findings from the workup.[6]

Treatment for ulcerative colitis depends on disease severity.[7,8] The goal of treatment is to attain remission during acute flares and to maintain this remission with long–term agents. Mild to moderate disease is usually managed with oral and/or topical 5–ASA. If refractory, prednisone may be added to the treatment regimen. If disease continues to be refractory, mercaptopurine–6 and azathioprine may be trialed. Severe disease may require biologic treatment with infliximab (Remicade), or surgical treatment with colectomy. Acute flares of severe disease should be treated with IV cyclosporine or methylprednisolone in hospital with the goal of transitioning to oral therapy. One should also keep in mind that immunocompromised patients, such as those with ulcerative colitis, are at high risk of developing superimposed infections such as CMV or C. difficile.[9,10] Antimicrobials and antivirals should be added to the treatment regimen if history and workup demonstrate findings of infection such as fever, tachycardia, bloody or loose stools, leukocytosis, positive blood or stool cultures or signs of bowel wall thickening on imaging. Acute disease that does not improve after 48-72 hours of IV treatment requires urgent colectomy. Indications for surgery in acute ulcerative colitis include failure to respond to medical therapy, fulminant colitis, toxic megacolon, perforation, or stricture.[11]

Although the absolute risk of perforation in acute ulcerative colitis remains low, this complication is well documented with several reported cases.[12-15] The risk of bowel perforation after colonoscopy is increased in patients with inflammatory bowel disease.[16] Colonoscopy during an acute flare of ulcerative colitis may increase this risk further. Other risk factors associated with colonoscopic perforation include female sex, advanced age, severe colitis, use of corticosteroids, presence of notable comorbidities such as cardiovascular, hepatic, metabolic and other GI disease, as well as stricture dilation. Lower–caliber endoscopes have been suggested as a possible solution to this. Pneumoperitoneum after colonoscopy is generally associated with bowel perforation, and the incidence of benign pneumoperitoneum is exceedingly low. The patient presented here underwent colonoscopy the day before pneumoperitoneum was noted. However, the transverse colon had been distended several days prior to this. It is impossible at this point to determine whether the perforation was strictly due to disease progression or a complication of colonoscopy. Regardless, it will be important to monitor this patient carefully, as post–operative complications following colectomy for acute ulcerative colitis may be as high as 27.0%.[17] Though colonoscopy remains an invaluable tool to monitor the progression of inflammatory bowel disease, patients at high risk of perforation should be identified and managed accordingly. Guidelines for the prevention of colonoscopic perforation have been proposed.[16] Physicians managing patients with acute ulcerative colitis should be well versed in such guidelines and aware of risks such as bowel perforation given its immediate life–threatening acuity.

Conclusion

Acute presentation of ulcerative colitis is a potentially life–threatening medical emergency. First–line therapy consists of medical treatment to induce disease remission in order to transition to oral maintenance therapy. Empiric antibiotic and antiviral coverage should be added for suspected superimposed infections. Complications of acute ulcerative colitis include bowel perforation and toxic megacolon. Bowel perforation after colonoscopy occurs at an increased frequency in these patients. Extra precautions should be taken when working with these patients in an attempt to reduce the risk of such perforation. The ultimate treatment for perforation is urgent colectomy.

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