

Perforated Solitary Diverticulitis of the Ascending Colon

CPT David S. Kauvar, MC, USA, MAJ, Jayson Aydelotte, MC, USA, and MAJ Michael Harnisch, MC, USA

Department of Surgery, Brooke Army Medical Center, Fort Sam Houston, Texas

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INTRODUCTION

Solitary diverticulae of the cecum or ascending colon are rare clinical entities. Diverticulitis can occur with these lesions, but the diagnosis is frequently missed as the presentation is similar to that of acute appendicitis and can mimic other acute intra-abdominal infections such as cholecystitis. Treatment of this condition is similar to that of left-sided diverticulitis. We report a case of solitary perforated diverticulum of the right colon in a patient who had a previous appendectomy and the diagnosis was mistaken for cholecystitis.

CASE REPORT

A 51-year-old otherwise healthy woman presented with a 3-day history of malaise, fever, and increasing pain in the right abdomen. Her surgical history was significant for a remote appendectomy. She denied symptoms of vomiting, diarrhea, constipation, hematochezia, melena, or dysuria. She also denied any history of chronic or recurrent abdominal pain before the presenting episode. On examination, she was febrile to 101.2°Fahrenheit, mildly tachycardic at 110 bpm, and had otherwise normal vital signs. Physical examination revealed diffuse abdominal tenderness, worst in the right upper abdomen with a positive Murphy's sign. No palpable masses were present, nor any blood on digital rectal examination. Her white blood cell count was 17,000 and shifted to the left. Her alkaline phosphatase was mildly elevated. An ultrasound of the right upper quadrant revealed a large, immobile gallstone at the neck of the gallbladder and peri-cholecystic fluid.

We took the patient to the operating room for laparoscopic

cholecystectomy with the working diagnosis of acute cholecystitis. On laparoscopic inspection, however, the gallbladder appeared normal and purulent fluid was collected above the liver. There was omental and peritoneal adhesion to the area of the hepatic flexure. We attempted laparoscopic exposure of this area, but we found it unsafe to proceed. We performed laparotomy and discovered a large, inflammatory mass at the antimesenteric surface of the hepatic flexure. A right hemicolectomy was performed, and a primary, stapled anastomosis was constructed. There was no other identifiable intraabdominal pathology. The gallbladder was left in place. On examination of the operative specimen, we discovered a single, large, perforated diverticulum at the area of the hepatic flexure (Fig. 1). There was an associated phlegmon/abscess cavity. Histologic examination revealed a severely inflamed, perforated diverticulum with its wall composed of mucosal and muscular layers (Fig. 2). The patient had an uneventful recovery and was discharged to home on postoperative day 6.

DISCUSSION

Diverticuli of the right colon exist in approximately 1% to 5% of patients with diverticular disease.¹⁻³ They are typically asymptomatic, acquired false pulsion diverticulae, similar to those found in the left colon. Solitary right-sided diverticulae are rare, with approximately 400 reported cases in the literature. These are frequently true diverticuli, which involve all layers of the bowel wall and are of embryologic origin, developing as an outpouching of the bowel wall during the sixth to seventh week of gestation.¹⁻³ Nearly all reports of this phenomenon have been of diverticulae in the cecum.

Right-sided diverticulitis is an uncommon diagnosis, with approximately 1000 cases reported, and perforation of a solitary, inflamed right-sided diverticulum is even more uncommon.^{4,5} Diverticulitis of the ascending colon affects a younger population than does its left-sided counterpart, with the average age in the fifth to sixth decade. There is a predilection for people of Asian descent, although the reason for this is unknown.³⁻⁶

Right-sided diverticulitis most commonly presents with

Correspondence: Inquiries to CPT David S. Kauvar, MC, USA, Brooke Army Medical Center, ATTN: MCHC-SDG, 3851 Roger Brooke Drive, Fort Sam Houston, TX 78234-6200; fax: (210) 916-2942; e-mail: david.kauvar@amedd.army.mil

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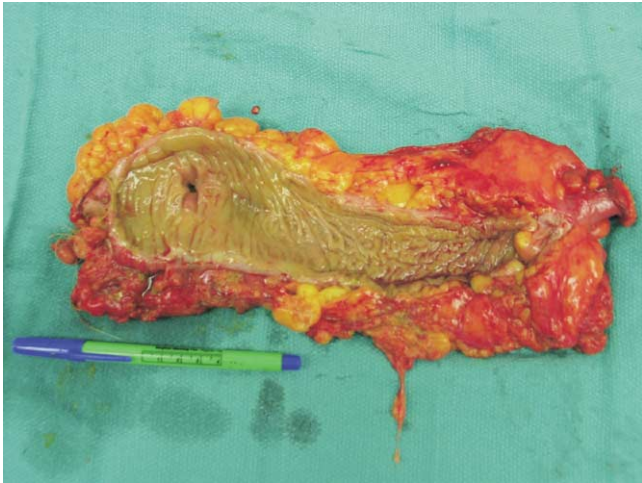


FIGURE 1. Photograph of the surgical specimen. The cecum and terminal ileum are to the right, with a large, solitary diverticulum visible near the hepatic flexure.

right lower quadrant abdominal pain and occasionally with fever, diarrhea, and abdominal mass. Eighty percent of these cases are mistaken for acute appendicitis, and the diagnosis is only rarely made before operation for this reason. Other diagnoses to be considered are perforated colonic tumor, cholecystitis, and infectious colitis.⁴⁻⁷ No clinical finding or diagnostic test can definitively diagnose diverticulitis of the right colon. Barium enema has not been shown to be helpful in making the diagnosis, but computed tomography with oral and intravenous contrast may be of some benefit.^{8,9} Treatment is the same as that for left-sided diverticulitis and consists of intravenous antibiotics in those rare cases in which the diagnosis is made preoperatively. The operation of

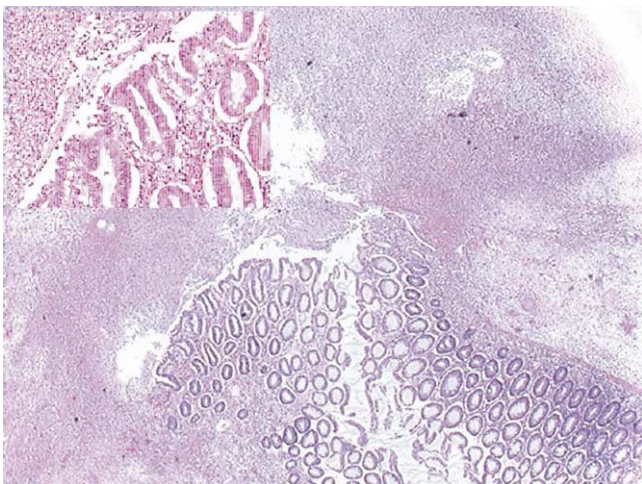


FIGURE 2. Photomicrograph of a section through the diverticular wall. The wall has a muscular component consistent with a true diverticulum and is ruptured. There is exudate surrounding the ruptured area (hematoxylin and eosin x200). Inset: There is an intense neutrophilic inflammatory reaction extending into the serosal fat (hematoxylin and eosin x1000).

choice is resection of the affected area with primary anastomosis. Various resections have been described, from limited ileocecectomy to right hemicolectomy.^{1,4,6,7}

The case presented above demonstrates the difficulty in making the preoperative diagnosis of right-sided diverticulitis, especially when the history reveals surgical absence of the most common mimic, the appendix. The clinical picture consisting of worsening abdominal pain, fever, malaise, an elevated white blood cell count, and focal peritonitis in the right upper quadrant with an ultrasound examination showing a large gallstone and peri-cholecystic fluid invited the diagnosis of acute cholecystitis. At operation, we found the gallbladder to be without any evidence of acute or chronic inflammation, and we performed a thorough laparoscopic examination of the remainder of the abdomen, finding the inflammatory process in the right colon. In the absence of a history consistent with biliary colic and with a clear source for the presenting illness, we left the gallbladder in place. We presumed the purulent fluid above the liver to be from the perforated diverticular abscess and to explain the finding of fluid around the gallbladder on ultrasound. Once the gallbladder was determined not to be the cause of the illness and free purulent fluid found in the peritoneum, we were obligated to search for the source, and once found, laparotomy was mandated for safe diagnosis and therapy.

CONCLUSION

Diverticulitis of the right colon is an uncommon clinical entity that is frequently mistaken for acute appendicitis but can mimic other intraabdominal infectious processes as well.⁹ Even in the absence of the possibility of appendicitis, it is an infrequent diagnostic consideration. Management of the condition is similar to that of left-sided diverticulitis, but surgical intervention is often performed because the diagnosis is frequently made at laparotomy.

In cases in which laparoscopy is performed for suspected cholecystitis in a patient with a clinical picture consistent with an intraabdominal infection and the gallbladder is found to be normal, a thorough laparoscopic investigation of the abdomen is mandatory.

REFERENCES

1. Graham SM, Ballantyne GH. Cecal diverticulitis: a review of the American experience. *Dis Colon Rectum*. 1987;30:821-826.
2. Mittal VK, Cortez JA, Olson AM. Solitary perforated diverticulum of the ascending colon: report of two cases. *Dis Colon Rectum*. 1981;24:47-49.
3. Mariani G, Tedoli M, Dina R, Giacomini I. Solitary diverticulum of the cecum and right colon: report of six cases. *Dis Colon Rectum*. 1987;30:626-629.

4. McFee AS, Sutton PG, Ramos R. Diverticulitis of the right colon. *Dis Colon Rectum*. 1982;25:254-256.
5. Gouge TH, Coppa GF, Eng K, Ranson JHC, Localio SA. Management of diverticulitis of the ascending colon: 10 years' experience. *Am J Surg*. 1983;145:387-391.
6. Lo CY, Chu KW. Acute diverticulitis of the right colon. *Am J Surg*. 1996;171:244-246.
7. Schmit PJ, Bennion RS, Thompson JE. Cecal diverticulitis: a continuing diagnostic dilemma. *World J Surg*. 1991;15:367-371.
8. Scully RE, Mark EJ, McNeely WF, McNeely BU. Case records of the Massachusetts General Hospital. *N Engl J Med*. 1987;317:432-441.
9. Katz DS, Lane MJ, Ross BS, Gold BM, Jeffrey RB, Mindelzun RE. Diverticulitis of the right colon revisited. *AJR*. 1998;171:151-156.