

Case Report

## Baffling perforation of the colon

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Idiopathic perforation of the colon is extremely unusual and unexpected, with a very limited number of published reports. The condition's definition depends on the absence of any detectable pathology in the bowel wall that could be responsible for the perforation.

A 62-year-old male patient presented with acute thrombosis of the brachial artery. This was successfully treated with an open thrombectomy and systemic anticoagulation, with rapid resolution of the symptoms. During the hospital stay the patient had regular bowel movements and no abdominal complaints. Suddenly he complained of acute abdominal pain. Physical examination and emergency CT scan of the abdomen were consistent with generalized peritonitis. Emergency laparotomy revealed two perforations of the mid-sigmoid colon, each measuring 1.5 x 1.5 cm, and located one in the antimesenteric aspect and one very close to the nutrient vessels. The edges of the perforations showed no inflammatory or necrotic changes. A 2.5 cm streak of macroscopically normal bowel wall was observed between the perforations. The rest of the bowel showed inflamed peritoneum with fibrin as a result of the peritonitis, but was otherwise normal. Sigmoid resection with a Hartmann's pouch was performed and the proximal colon was brought out in the form of an end-colostomy. The abdomen was thoroughly lavaged with warm saline and temporarily closed with plastic sheeting for second-look exploration. Bacteriology from the intra-abdominal fluid showed mixed abdominal flora and no unusual pathogens. The patient was returned to the operating room on five occasions 24-48 h apart for planned re-explorations and peritoneal irrigations. The abdominal wall was restored on postoperative day 12 once a macroscopically clean peritoneum was noted. The patient was transferred to an acute rehabilitation facility. He is known to be alive and recuperating more than eight months after the surgery.

Pathology from the colon revealed an inflamed visceral peritoneum with fibrin and otherwise normal-looking mucosa. There were no diverticula. The edges of each perforation showed no alteration of the muscle or mucosa. Histology from both perforations demonstrated normal intestinal wall architecture, normal mesenteric structures including nutrient vessels and lymphatic tissue, and no specific condition responsible for the perforations. No changes suggestive for ischemia or any other pathology were noted (Figure 1).

Idiopathic perforation of the colon is rare. The diagnosis depends on excluding other conditions that can potentially contribute to the condition's occurrence. No pathology that might have caused colonic perforation could be identified in

our patient. It could be argued that, based on the preceding vascular emergency, the perforations resulted from a second thrombotic event involving the colonic nutrient vessels.

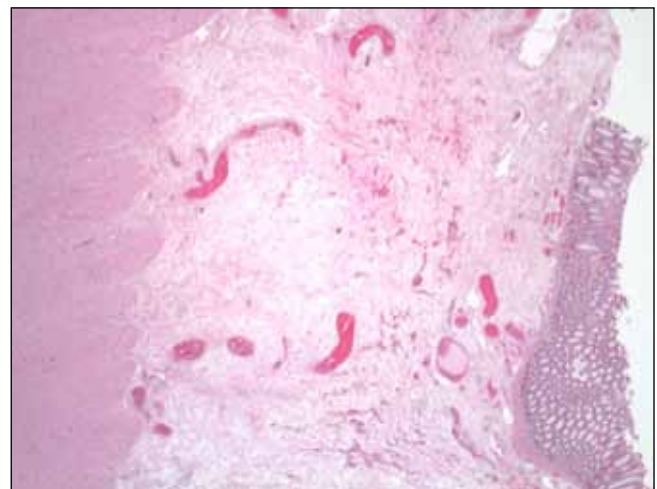


Fig 1. Microscopy of the perforation's edge showing normal mucosa with hemorrhage in submucosa, and normal muscular layer. There is no necrosis and the vessels are patent. The inflammatory changes in the serosal layer are consistent with peritonitis. Hematoxylin & Eosin, x 44.

Histologically, acute ischemia of the colon shows necrosis of the superficial portion of the mucosa, pseudomembranes, cryptitis, and crypt abscess<sup>1</sup>. A detailed histology review of the specimen did not reveal any of the changes, ruling out ischemic perforation of the colon.

Idiopathic perforation of the colon has infrequently been discussed in the literature, with less than 100 reported cases.<sup>2-5</sup> Numerous theories have been put forward to explain the condition's etiology including occult hernias, high intra-abdominal or intra-luminal pressure, colonic implosion, attenuation of the bowel wall, or laceration of the latter from hard feces, however, none of these factors has been supported

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by existing evidence.<sup>2,4</sup> The majority of patients affected by idiopathic perforation have been older than 40 years and presented with acute abdomen. The perforations measured from 0.5 cm to 15 cm and were typically single and located in the antimesenteric aspect of the sigmoid colon in more than 50% of the cases.<sup>3,5</sup> The mechanism of the two simultaneous perforations observed in our patient remains unclear. Idiopathic perforation of the colon has been observed with an increasing incidence in newborn infants. The hypotheses about its etiology in this particular group include, in analogy to the adult group, mechanical injury, muscular defects in the colonic wall, infection, perforation by meconium plugs, and necrotizing enterocolitis, with no definite supporting evidence.<sup>2,5</sup> The invariably normal pathological findings do not support either the above factors, or a recently proposed theory entertaining ischemic necrosis secondary to a much localized vascular accident in the wall of the affected bowel.<sup>5</sup>

The treatment of all idiopathic perforations is surgical and encompasses one of three treatment methods. These are: 1) Simple closure of the lesion or limited resection with anastomosis; 2) Exteriorization resection, or 3) Hartmann's pouch and proximal colostomy, depending on the topographic location of the perforation and the severity of peritonitis. Because of the small number of published cases exact guidelines as to the extent of surgery and its impact on morbidity and mortality cannot be formulated.

The etiology of idiopathic perforation of the colon remains unclear. The published literature provides no reliable

information whether the mysterious entity is the same in the pediatric and adult groups. The limited number of studies so far support that early recognition and treatment contribute to a successful outcome in the majority of patients. Further studies exploring the intestinal ultrastructure are expected to yield more information about idiopathic perforation of the colon, provided that judicious criteria for its determination are applied.

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