Reoperation following Minimally Invasive Surgery: Are the “Rules” Different?

James T. McCormick, D.O.¹ and Clifford L. Simmang, M.D.²

ABSTRACT

This article discusses various indications for reoperation and how employing laparoscopy at primary operation might affect the incidence, presentation, and treatment of common complications. The abdomen is likely to be far less hostile after laparoscopic surgery than after laparotomy. Adhesions to the anterior abdominal wall are minimal or absent. As a result, relaparoscopy is a reasonable diagnostic and often successful treatment modality in patients suspected of having intra-abdominal complications following laparoscopic operation. Laparoscopic success in dealing with acute bowel obstruction after laparoscopic surgery is related to the paucity of adhesions and unique mechanisms of obstruction that are localized and amenable to minimal dissection. The same mechanisms are also responsible for the increased risk of bowel necrosis associated with bowel obstruction after laparoscopic surgery. Limited experience with successful laparoscopic management of bleeding and anastomotic leak has been reported with the caveat that if the bleeding or contamination is excessive, cannot be identified and controlled quickly, or is unresponsive to a reasonable and brief effort using laparoscopy, a prompt laparotomy is indicated. Based on the current literature, it is reasonable to conclude that laparoscopic approaches to primary Crohn's disease and relaparoscopy for recurrence are an appropriate (perhaps the most appropriate) management strategy. Also, laparoscopic restorative proctocolectomy and ileal pouch–anal anastomosis after laparoscopic subtotal colectomy is the preferred treatment for toxic ulcerative colitis. We conclude that laparoscopic reoperative surgery is feasible for the treatment of many complications following laparoscopic major abdominal surgery and bowel resection.

KEYWORDS: Laparoscopy, reoperative surgery, colon resection, complication, inflammatory bowel disease

Objectives: Upon completion of this article, the reader should be familiar with reoperation following minimally invasive procedures.

Reoperative surgery may be required for several indications. Laparoscopic reoperative surgery can be performed safely after both open^{1,2} and laparoscopic surgery.³ The most common lifelong reason for reoperative surgery is small bowel obstruction. For the colo-

rectal surgeon, reoperation may also be required early in the postoperative course to deal with acute complications such as bleeding or anastomotic leak. Later presenting indications include takedown of intestinal stomas and staged procedures (toxic ulcerative colitis) and recurrence

¹Department of Surgery, Division of Colon and Rectal Surgery, Western Pennsylvania Hospital, Clinical Campus of Temple University School of Medicine, Pittsburgh, Pennsylvania; ²Texas Colon and Rectal Surgeons, private practice, Dallas, Texas.

Address for correspondence and reprint requests: James T. McCormick, D.O., Department of Surgery, Division of Colon and Rectal Surgery, Western Pennsylvania Hospital, Clinical Campus of

Temple University School of Medicine, 4800 Friendship Ave., Pittsburgh, PA 15224. E-mail: cormick@pol.net.

Reoperative Surgery, Guest Editor, Michael J. Stamos, M.D. Clin Colon Rectal Surg 2006;19:217–222. Copyright © 2006 by Thieme Medical Publishers, Inc., 333 Seventh Avenue, New York, NY 10001, USA. Tel: +1(212) 584-4662. DOI 10.1055/s-2006-956443. ISSN 1531-0043.

of disease (Crohn's disease or cancer). The collective literature contains a paucity of data detailing any large-volume experience with laparoscopic reoperation following minimally invasive colorectal surgery. We therefore have relied heavily upon the general and bariatric surgical literature for this review. Our goal is to discuss various indications for reoperation and how employing laparoscopy at primary operation might affect the incidence, presentation, and treatment of common complications. This article reviews the literature as it pertains to reoperative laparoscopy. We discuss the role of laparoscopy in reoperation after minimally invasive colorectal surgery.

The authors are enthusiastic about employing minimally invasive technology in the management of both early and late complications after laparoscopic surgery. The abdomen is likely to be far less hostile after laparoscopic surgery than after laparotomy. Adhesions to the anterior abdominal wall are minimal or absent⁴ (Fig. 1). Inflammatory changes and scarring at the operative site are truncated. These factors may make relaparoscopy safer and less challenging than reoperative surgery after conventional surgery by laparotomy.

BOWEL OBSTRUCTION

The commonest reason for reoperation after general abdominal surgery is adhesive small bowel obstruction. This may not be the case following laparoscopy because of a purported decrease in adhesion formation following the laparoscopic approach.⁵ Preliminary evidence in this regard can be found by noting that laparoscopy-assisted ileocolic resection is associated with a reduced rate of bowel obstruction compared with open surgery.^{6,7}

Adhesion formation is a local response of the peritoneum and peritonealized structures to ischemia, desiccation, or trauma and may occur as result of the primary disease process or contact with surgical instruments, staples, suture, gloves, sponges, and other irritants introduced at the time of surgery. It is assumed that laparoscopy can minimize some of these insults by limiting bowel manipulation⁸⁻¹⁰ and exposure of the peritoneal surface to potential irritants. In addition, the CO₂ pneumoperitoneum is thought to be protective of certain types of injury.^{11,12} Some have gone so far as to suggest that adhesive bowel obstruction may even become a disease of historical interest in the laparoscopic era.¹³ Since this early proclamation, we now know that adhesions do indeed form and reform after laparoscopy, primarily in the operative field.^{14,15}

Despite these advantages, bowel obstruction continues to occur with some frequency in patients following laparoscopic surgery. The mechanism, severity, and risk of obstruction have shifted, however. In a report for the French Association for Surgical Research, Duron and colleagues¹⁵ noted that only 33% of postoperative bowel obstructions following various laparoscopic surgeries were due to multiple adhesions and an additional 17% were due to a single band. Intestinal incarceration (in abdominal wall defect or port site) was responsible for another 46%. All told, 25% of patients required resection. This high risk of bowel necrosis correlates well with our own experience detailed in the following. They noted that culprit adhesions and bands originated in the operative field most commonly. The surgeons handled 6 of these 24 obstructions with laparoscopy.

A report from the Western Pennsylvania Hospital states that unique mechanisms of bowel obstruction such

Figure 1 (A, B) Laparoscopic images demonstrating lack of adhesions in a patient undergoing laparoscopic appendectomy for appendicitis 2 years after hand-assisted laparoscopic anterior resection for recurrent sigmoid diverticulitis. (Courtesy of Thomas E. Read, M.D., Pittsburgh, PA.)

as internal hernia are common after laparoscopic bariatric surgery.³ This is assumed to be the result of a laparoscopy-related decrease in scar formation between newly apposed peritoneal surfaces leaving defects open.¹⁶ One can imagine the same phenomenon following laparoscopic colon resection. Obstructions due to internal hernia are associated with a high incidence of bowel-threatening ischemia and therefore require a high index of suspicion and prompt surgical management. Our experience with this population of patients is that relaparoscopy is an excellent technique for diagnosing and managing these obstructions and other complications.³

Laparoscopic success in dealing with acute bowel obstruction after laparoscopic surgery could be related to the paucity of adhesions and unique mechanisms of obstruction that are localized and amenable to minimal dissection. With the exception of the obstruction due to a single band, adhesive bowel obstruction can present more of a challenge. Some authors have reported a 66% success rate with laparoscopic approaches to dealing with acute adhesive bowel obstruction after open surgery in a highly selected group of patients. Eighty-eight percent of these cases were due to a single band or local adhesions.¹⁷ These authors did not attempt laparoscopy in patients who were massively distended, had clinical evidence concerning for peritonitis, or had more than two previous operations. These are reasonable guidelines. It is unfortunately not always possible to predict the intraoperative findings. We employ laparoscopic exploration for appropriate candidates with early conversion to laparotomy when obstruction is not due to a single band or localized adhesive disease.

Trocar sites are implicated as the most common cause of bowel obstruction in the early postoperative period.^{15,18,19} These may be from adhesions or from incarcerated bowel or omentum. Culprit port sites are 10 mm in size or greater in most cases. Early presenting obstructions from trocar site complications can be addressed locally with an incision over the involved port site or by laparoscopy. Obstruction arising remotely is better addressed laparoscopically. One must carefully inspect involved bowel searching for noncircumferential necrosis as can occur with Richter's hernia.

In the absence of signs of bowel in jeopardy, early postoperative bowel obstruction after laparotomy is generally treated for 4 to 6 weeks with decompression and nutritional support. This approach is taken because dense adhesions make reoperation hazardous in the early postoperative period and the adhesions responsible for the obstruction are assumed to "soften" with time as acute inflammation resolves.²⁰ This philosophy is not applicable to bowel obstruction after laparoscopy. First, prohibitive diffuse dense adhesions have not been reported to form after elective laparoscopic surgery. Second, and most important, because the pathophysiology

of bowel obstruction after laparoscopy is different from that after laparotomy, a nonoperative approach may be more likely to result in bowel necrosis. To avoid this tragedy, a high index of suspicion is required to facilitate prompt diagnosis and early reoperation.

Technical Points

When operating for bowel obstruction, one may access the peritoneal cavity through a previous port site using the Hasson technique or by establishing pneumoperitoneum with a Veress needle at a site remote from previous surgery and using a VisiportTM (US Surgical/TYCO) or OptiportTM (Ethicon Endosurgery, Cincinnati, OH) to gain access. The authors prefer the latter technique, most commonly at a left upper quadrant site as described by Caushaj.^{21,22} The rationale for this approach is that, as discussed previously, port site complications are the commonest cause of postlaparoscopy bowel obstruction and adhesions to port sites do occur. Avoiding these areas until direct visualization is achieved may decrease risk of bowel injury. After access is obtained, the abdomen is explored. If the site of obstruction is not obvious and it is necessary to run the bowel, it is safer and easier to do so starting at the terminal ileum and running the normal decompressed distal bowel toward the point of obstruction. If a single band or internal hernia causes the obstruction, the bowel may be reduced during this process and the obstruction relieved. The band should be divided or the potential space (hernia) closed.

Excessive manipulation of dilated or compromised bowel even with atraumatic bowel graspers is avoided to curtail risk of enterotomy and contamination. Contamination that cannot be quickly and effectively controlled should prompt immediate laparotomy. Laparoscopic repair of minor bowel injuries is feasible using intracorporeal suturing techniques if these surgical skills have been mastered. Alternatively, bowel can be exteriorized through a small incision and addressed directly. If bowel necrosis is present, laparotomy is advisable in most cases. Although bowel resection can be accomplished laparoscopically, this may represent a point of diminishing returns for minimally invasive surgery.

BLEEDING AND ANASTOMOTIC LEAK

Hemorrhage and anastomotic leak are potentially life-threatening technical complications occurring in the early postoperative period that may require prompt operative intervention. The feasibility of successful reoperative laparoscopy to treat serious complications following laparoscopic cholecystectomy and antireflux procedures has been documented.

Dexter and colleagues²³ reported successful relaparoscopy in 13 of 14 patients requiring reoperation after

laparoscopic cholecystectomy. The indication in three patients was bleeding discovered to be from a port site in two instances and venous ooze from the gallbladder fossa in the other. Bleeding was managed with suture ligation and electrocoagulation, respectively. Seven patients were treated with clips, lavage, or T-tube placement for bile leak at relaparoscopy. Three additional patients with essentially normal relaparoscopy had peritoneal lavage. One patient diagnosed with small bowel injury was converted to laparotomy. Other authors have reported the successful laparoscopic management of bile leak from a duct of Luschka.²⁴

Yau and colleagues²⁵ have successfully managed complications following laparoscopic antireflux surgery in 18 of 23 patients for whom this approach was attempted. Included in this series was control of bleeding from a short gastric vessel with a laparoscopically placed clip. Multiple wrap revisions were undertaken laparoscopically. They claimed that relaparoscopy within 7 days of the initial operation was more likely to be successful. The authors converted a case of gastric perforation noted on relaparoscopy to laparotomy for definitive management. Success with relaparoscopy has led over time to expanded use for a broader set of indications.

The aforementioned authors tout relaparoscopy as a reasonable diagnostic and often successful treatment modality in patients suspected of having intra-abdominal complications following laparoscopic cholecystectomy and antireflux surgery. Others have made this same claim for complications of more complex laparoscopic surgery such as gastric bypass.^{3,16}

In their experience of laparoscopic colorectal surgery, De Mulder et al²⁶ reported a successful relaparoscopy for bleeding in one patient and for anastomotic leak in two patients. In this series, two additional anastomotic leaks were treated with diverting stoma (a procedure that can be easily be performed laparoscopically^{27,28}). Although the authors do not detail their technique, their success implies feasibility for laparoscopy in treatment of these complications.

Boulez and colleagues²⁹ treated 9 of 16 *intra-operative* operative complications including anastomotic leak, damage to small bowel, and control of hemorrhage laparoscopically. However, they did *not* report performing relaparoscopy for any of eight postoperative complications requiring reoperation. This article is cited to point out the limited experience with relaparoscopy for postoperative complications after laparoscopic colorectal surgery even in experienced hands.

The authors have utilized laparoscopic technology in the treatment of postoperative hemorrhage after laparoscopic appendectomy. Access was obtained using previous port sites. The right lower quadrant was irrigated and suctioned. The appendiceal artery was identified and grasped. An EndoloopTM (Ethicon/Johnson and Johnson) ligature was placed around the mesoap-

pendix. Clot that could not be suctioned was collected in an EndocatchTM (US Surgical/TYCO) bag and delivered through the umbilical port site.

Technical Points

For anastomotic leak or bleeding requiring operative intervention, laparoscopic takedown of the anastomosis, washout of the abdomen, and reconstruction of the anastomosis is technically feasible. The decision whether also to create a diverting or end stoma is individualized. The technique would approximate the original operation and probably involve resection of some portion of devitalized bowel. One should be prepared to mobilize additional bowel as necessary to facilitate a tension-free anastomosis between two ends of well-perfused, soft, pliable bowel. If the surgeon is uncomfortable recreating or reinforcing the anastomosis using straight laparoscopic technique, a port site can be lengthened to 3 to 4 cm, the bowel ends can be grasped and exteriorized, and an extracorporeal anastomosis completed. In the case of an anastomosis involving the rectum, after mobilization of the proximal bowel, a 5- to 7-cm Pfannenstiel incision can be made and anastomosis conducted using open surgical principles. Each of these hybrid techniques may help preserve most of the benefits of a minimally invasive approach.

Intra-abdominal bleeding requiring surgery can be addressed using techniques described previously. The biggest challenge appears to be localizing the site of hemorrhage. The peritoneal cavity must be lavaged to remove blood and clot and facilitate visualization. If the bleeding site can be identified, it can be controlled using electrocautery, suture ligation, EndoloopTM (Johnson and Johnson), LigasureTM (USS/TYCO), or ultrasonically activated shears.

If no specific bleeding site is identified, bleeding may be from the raw surface (commonly the retroperitoneum or pelvis) where dissection took place. If hemorrhage is ongoing and the source not localized by laparoscopy, laparotomy is required.

Caveat

It is unacceptable to allow a patient to exsanguinate or suffer from unnecessary ongoing contamination while the surgeon is struggling to preserve the tenets of minimally invasive surgery. If the bleeding is excessive, cannot be identified and controlled quickly, or is unresponsive to a reasonable and brief effort using laparoscopy, a prompt laparotomy is indicated. Likewise, if efforts to halt ongoing contamination fail, externalization, laparotomy, or stoma creation is appropriate. All patients undergoing colorectal surgery should be prepared for the possible need for laparotomy or stoma, or both, as required for safety.

RECURRENT CROHN'S DISEASE

Hasegawa et al⁴ compared results of laparoscopic reoperative surgery for ileocolic Crohn's disease to primary resection. They found no increase in complication or conversion rate in the reoperative group. A subset of nine patients in the reoperation group had undergone a laparoscopic approach for their primary procedure. The operating time was shorter and blood loss less in patients who underwent the primary procedure laparoscopically. The authors attributed this to their observation of minimal adhesions to the abdominal wall when the primary procedure had been performed laparoscopically.

Lowney et al³⁰ reported successful laparoscopic treatment of Crohn's disease recurrence in three of six patients after laparoscopic ileocolic resection. They were less successful (4 of 12) with attempts to treat recurrent disease laparoscopically after open ileocolic resections.

Patients with Crohn's disease frequently require reoperation, and laparoscopy-assisted ileocolic resection is associated with a reduced rate of bowel obstruction compared with open surgery.^{6,7} Taking these data into account, it is reasonable to conclude that laparoscopic approaches to primary Crohn's disease and relaparoscopy for recurrence are an appropriate (perhaps the most appropriate) management strategy.

CANCER RECURRENCE

The authors could find no reports of laparoscopy employed for resection of recurrence of colorectal cancer after laparoscopic resection of the primary tumor. Locoregional recurrence after a properly performed resection for primary colorectal cancer usually occurs in the mesentery. In our experience with 227 laparoscopic major abdominal colorectal operations in a 12-month period, 2 were attempted for recurrent cancer. Both resulted in conversion because the tumor mass could not be isolated from the base of mesentery of the small bowel in one case and from the pancreas and second portion of the duodenum in the other. Based on this limited experience, we believe that, with the exception of the rare luminal recurrence, most recurrent colorectal carcinomas are not amenable to a laparoscopic approach regardless of the initial approach.

STAGED PROCEDURES

Laparoscopy-assisted subtotal colectomy and ileostomy are an excellent treatment option for acute (toxic) ulcerative colitis. Various authors have reported successful laparoscopic restorative proctocolectomy and ileal pouch-anal anastomosis (IPAA) after laparoscopic subtotal colectomy for acute (toxic) ulcerative colitis in 6 of 10 patients,³¹ 17 of 18 patients,³² and 13 of 16 patients.³³ The laparoscopic subtotal colectomy is a rewarding procedure providing rapid recovery. Employing

laparoscopy at the initial operation makes the completion proctectomy and IPAA less challenging for reasons already discussed.

CONCLUSIONS

Laparoscopic reoperative surgery is feasible for the treatment of many complications following laparoscopic major abdominal surgery and bowel resection. One must be willing and able to perform prompt laparotomy when appropriate. Laparoscopy for primary resection for Crohn's disease facilitates laparoscopic reoperative surgery for recurrence with the additional benefit of decrease in bowel obstruction rates. Planned laparoscopic staged procedures for diseases such as toxic ulcerative colitis can be reliably completed and should be expected to provide the benefits of a minimally invasive approach.

DISCLOSURE

The authors have no conflicts to disclose relative to this article.

REFERENCES

1. McCormick JT, Papasavas PK, Caushaj PF, Gagne DJ. Laparoscopic revision of failed open bariatric procedures. *Surg Endosc* 2003;17:413-415
2. Wu J, Birnbaum E, Kodner I, Fry R, Read T, Fleshman J. Laparoscopic-assisted ileocolic resections in patients with Crohn's disease: are abscesses, phlegmons, or recurrent disease contraindications? *Surgery* 1997;122:682-689
3. Papasavas PK, Caushaj PF, McCormick JT, et al. Laparoscopic management of complications following laparoscopic Roux-en-Y gastric bypass for morbid obesity. *Surg Endosc* 2003;17:610-614
4. Hasegawa H, Watanabe M, Nishibori H, Okabayashi K, Hibi T, Kitajima M. Laparoscopic surgery for recurrent Crohn's disease. *Br J Surg* 2003;90:970-973
5. Reissman P, Teoh T-A, Skinner K, Burns J, Wexner SD. Adhesion formation after laparoscopic anterior resection in a porcine model. *Surg Laparosc Endosc* 1996;6:136-139
6. Alabaz O, Iroatulam A, Nessim A, Weiss E, Nogueras J, Wexner S. Comparison of laparoscopically assisted and conventional ileocolic resection for Crohn's disease. *Eur J Surg* 2000;166:213-217
7. Bergamaschi R, Pessaux P, Arnaud J. Comparison of conventional and laparoscopic ileocolic resection for Crohn's disease. *Dis Colon Rectum* 2003;46:1129-1133
8. Hiki N, Shimizu N, Yamaguchi H, et al. Manipulation of the small intestine as a cause of the increased inflammatory response after open compared with laparoscopic surgery. *Br J Surg* 2006;93:195-204
9. Kalf J, Schraut WH, Simmons RL, Bauer AJ. Surgical manipulation of the gut elicits an intestinal muscularis inflammatory response resulting in postsurgical ileus. *Ann Surg* 1998;228:652-663

10. Schwarz NT, Kalff JC, Turler A, et al. Selective jejunal manipulation causes postoperative pan-enteric inflammation and dysmotility. *Gastroenterology* 2004;126:159–169
11. Daphan CE, Agalar F, Hascelik G, Onat D, Sayek I. Effects of laparotomy, and carbon dioxide and air pneumoperitoneum, on cellular immunity and peritoneal host defenses in rats. *Eur J Surg* 1999;165:253–258
12. Hanly EJ, Mendoza-Sagaon M, Murata K, Hardacre JM, De Maio A, Talamini MA. CO₂ pneumoperitoneum modifies the inflammatory response to sepsis. *Ann Surg* 2003;237:343–350
13. De Wilde RL. Goodbye to late bowel obstruction after appendectomy. *Lancet* 1991;338:1012
14. Parker J, Sinaii N, Segars J, Godoy H, Winkle C, Stratton P. Adhesion formation after laparoscopic excision of endometriosis and lysis of adhesions. *Fertil Steril* 2005;84:1457–1461
15. Duron JJ, Hay JM, Msika S, et al. Prevalence and mechanisms of small intestinal obstruction following laparoscopic abdominal surgery: a retrospective multicenter study. *French Association for Surgical Research. Arch Surg* 2000;135:208–212
16. Higa K, Ho T, Boone K. Internal hernias after laparoscopic Roux-en-Y gastric bypass: incidence, treatment and prevention. *Obes Surg* 2003;13:350–354
17. Liauw J, Cheah W. Laparoscopic management of acute small bowel obstruction. *Asian J Surg* 2005;28:185–188
18. Jones DB, Callery MP, Soper NJ. Strangulated incisional hernia at trocar site. *Surg Laparosc Endosc* 1996;6:152–154
19. Patterson M, Walters D, Browder W. Post-operative bowel obstruction following laparoscopic surgery. *Am Surg* 1993;59:656–657
20. Pickleman J, Lee RM. The management of patients with suspected early postoperative small bowel obstruction. *Ann Surg* 1989;210:216–219
21. Caushaj PF. Fundamental principles and perioperative management. In: Jacobs M, Plasescia G, Caushaj PF, eds. *Atlas of Laparoscopic Surgery*. Baltimore, MD: Williams & Wilkins; 1996:13–15
22. Rohatgi A, Widdison AL. Left subcostal closed (Veress needle) approach is a safe method for creating a pneumoperitoneum. *J Laparoendosc Adv Surg Tech A* 2004;14:278–280
23. Dexter S, Miller G, Davides D, et al. Relaparoscopy for the detection and treatment of complications of laparoscopic cholecystectomy. *Am J Surg* 2000;179:316–319
24. Tsalis K, Zacharakis E, Vasiliadis K, et al. Bile duct injuries during laparoscopic cholecystectomy: management and outcome. *Am Surg* 2005;71:1060–1065
25. Yau P, Watson D, Devitt P, Game P, Jamieson G. Early reoperation following laparoscopic antireflux surgery. *Am J Surg* 2000;179:172–176
26. De Mulder W, Gillardin J, Hofman Y, Von Molhem Y. Laparoscopic colorectal surgery. Analysis of the first 237 cases. *Acta Chir Belg* 2001;101:25–30
27. Liu J, Bruch H, Farke S, Nolde J, Schwandner O. Stoma formation for fecal diversion: a plea for the laparoscopic approach. *Tech Coloproctol* 2005;9:9–14
28. Ludwig KA, Milsom JW, Garcia-Ruiz A, Fazio VW. Laparoscopic techniques for fecal diversion. *Dis Colon Rectum* 1996;39:285–288
29. Boulez J, Espalieu Ph, Fontaumard E, Meeus P. Laparoscopic colo-rectal surgery; analysis of 113 cases. *Hepatogastroenterology* 1997;44:40–44
30. Lowney JK, Dietz DW, Birnbaum EH, Kodner IJ, Mutch MG, Fleshman JW. Is there any difference in recurrence rates in laparoscopic ileocolic resection for Crohn's disease compared with conventional surgery? A long-term, follow-up study. *Dis Colon Rectum* 2006;49:58–63
31. Dunker MS, Bemelman WA, Slors JF, van Hogeand RA, Ringers J, Gouma DJ. Laparoscopic-assisted vs. open colectomy for severe acute colitis in patients with inflammatory bowel disease (IBD): a retrospective study in 42 patients. *Surg Endosc* 2000;14:911–914
32. Bell RL, Seymour NE. Laparoscopic treatment of fulminant ulcerative colitis. *Surg Endosc* 2002;16:1778–1782
33. Marcello PW, Milsom JW, Wong SK, Brady K, Goormastic M, Fazio VW. Laparoscopic total colectomy for acute colitis: a case-control study. *Dis Colon Rectum* 2001;44:1441–1445