

The Role of Intraoperative Proctosigmoidoscopy in Laparoscopic Pelvic Surgery

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Abstract

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Study Objective. To report the outcome of rigid sigmoidoscopy during operative laparoscopy in patients at high risk for rectosigmoid and large bowel injury.

Design. Prospective patient database with retrospective chart review (Canadian Task Force classification II-3).

Setting. Referral practice and tertiary medical center.

Patients. Two hundred sixty-two women with rectosigmoid endometriosis and adhesions.

Interventions. Rigid sigmoidoscopy during laparoscopy. At the end of surgery, proctosigmoidoscopy was performed to evaluate intraluminal abnormality or rectosigmoid injury. The pelvis was then filled with isotonic fluid to observe laparoscopically for air leakage.

Measurements and Main Results. Sigmoidoscopy was performed due to a lesion involving the rectum or sigmoid in 60.7%, large bowel in 11.1%, and posterior cul-de-sac in 28.2% of patients. During laparoscopy, endometriosis was found in 30.5%, adhesions in 20.2%, and both in 43.5%. Four women (1.5%) had bowel injury identified during sigmoidoscopy; all bowel injuries were treated by intracorporeal laparoscopic suturing. One incomplete repair was detected by sigmoidoscopy. In one woman (0.4%) a rectal polyp was detected.

Conclusion. Bowel injury is one of the most serious complications of laparoscopy. Early detection and prompt intraoperative management are essential to prevent a potentially catastrophic outcome. Sigmoidoscopy is a relatively easy procedure and aids during laparoscopy in the diagnosis of bowel perforation and in assessment of bowel wall invasion and potential stricture caused by endometriosis. It is a safe procedure even when performed immediately after extensive laparoscopic surgical treatment of rectosigmoid endometriosis and adhesions.

Prevention and early detection of complications are of major importance for growing acceptance of advanced laparoscopic surgery.¹ Knowledge of anatomy and excellent surgical skills are necessary to minimize complications. Even in experienced hands, however, not all complications can be prevented, and when they do occur immediate diagnosis is essential.²

Bowel injury after laparoscopic surgery is rare and may have unusual characteristics and devastating sequelae.³ Based on the numbers of patients in recent series, it is possible to estimate the risk of gastrointestinal injuries occurring during gynecologic laparoscopy at between 0.6 and 1.6/1000.⁴⁻⁸ A survey of the surgical and gynecologic literature revealed 266 laparoscopic bowel perforation injuries in 205 969 laparoscopic cases, 58% of the small bowel and 32% of the colon, with a combined incidence of 1.3/1000 cases.⁹ Only 50% were caused by electrocoagulation. Most (69%) were not recognized at surgery, and 80% of these patients required repair by laparotomy.

Laparoscopic surgery involving the sigmoid colon is commonly performed for treatment of severe pelvic endometriosis and adhesions.^{10,11} Prompt and accurate diagnosis of proctosigmoid injury is crucial, since it should be treated when it is recognized to avoid severe morbidity and potentially fatal outcome.^{3,8} Prevention of bowel injury relies on the surgeon's experience, strict observance of safety rules, perfect familiarity with physical properties of instruments, systematic bowel preparation for patients at risk of bowel complications, supervision of the route taken by trocars, meticulous inspection on completion of surgery of all areas of bowel adhesiolysis, and, in case of doubt, tests for leakage involving the rectosigmoid.^{2,8}

Performed intraoperatively after bowel resection or proctectomy, rigid proctoscopy is helpful to the surgeon in evaluating anastomosis and checking for anastomotic leaks. After anastomosis is complete, the surgeon introduces saline into the abdominal cavity and clamps above the anastomosis. The lumen can then be insufflated and the anastomosis

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visualized to check for bleeding and disruption. Leaks can be detected simultaneously by looking for bubble formation. If a leak is seen it can be repaired immediately, thereby significantly decreasing the rate of postoperative leaks.^{12,13}

We evaluated the outcome of intraoperative rigid sigmoidoscopy in detecting bowel injury during operative laparoscopy in selected patients at high operative risk for rectosigmoid and colon disease or injury.

Materials and Methods

This was an observational study (July 1993–July 1995) based on 262 consecutive women (average age 36 yrs, range 24–52 yrs) who underwent operative laparoscopy for rectosigmoid endometriosis and severe adhesions using techniques described elsewhere.^{10,14} Preoperatively all patients received a detailed explanation of the laparoscopic procedure and risks involved, and signed a general surgical informed consent. As it was a summary of our routine surgical protocol, and not an interventional study, approval from the institution's human investigation board was not obtained. Main indications for surgery were chronic pelvic pain, endometriosis, and adhesions (88.6%).

All patients underwent outpatient bowel preparation before laparoscopy.¹⁴ At the end of surgery, proctosigmoidoscopy was routinely performed to evaluate intraluminal abnormality, rectal and rectosigmoid injury, and rectosigmoid repair. The posterior cul-de-sac was simultaneously filled with isotonic fluid and the rectum inflated with air to observe laparoscopically for air leakage.

A rigid sigmoidoscope was used to inflate the rectosigmoid and allow direct visualization of bowel lumen up to the rectosigmoid junction (15–22 cm). The patient remained under general anesthesia in modified dorsolithotomy position in stirrups, as described for operative laparoscopy,¹⁴ during sigmoidoscopy and required only minimal repositioning.

Follow-up data were obtained either by reviewing patients' postoperative charts or through telephone interviews.

Results

Intraoperative findings during laparoscopy were pelvic endometriosis in 30.5% of patients, pelvic adhesions in 20.2%, and both in 43.5%. Sigmoidoscopy was indicated due to treatment of lesions involving the rectum or sigmoid in 60.7%, large bowel in 11.1%, and posterior cul-de-sac in 28.2%. We encountered enterotomy in 44 women (16.8%).

All bowel injuries were promptly diagnosed intraoperatively. In four women (1.5%) they were identified only during sigmoidoscopy. All these injuries were treated by intracorporeal laparoscopic suturing as described elsewhere.¹⁴ One incomplete repair was detected by intraoperative sigmoidoscopy. Proctosigmoidoscopy allowed the detection of a benign rectal polyp in one woman (0.4%). No cases of postoperative bowel perforation occurred.

Discussion

Gastrointestinal complications are diagnosed during surgery in only one-third of cases, with injuries during laparoscopic surgery often going undetected.^{1,4,8} The rectosigmoid colon can be injured if the depth of penetration by endometriosis is underestimated or the cul-de-sac is obliterated.¹⁴ When the rectum is adherent to the posterior aspect of the cervix or uterosacral ligaments, blunt dissection may lacerate the rectum.¹⁰

When a difficult pelvic operation is contemplated, such as dissection of cul-de-sac nodules in a woman with endometriosis or history suggesting significant pelvic pathology, preoperative bowel preparation is indicated.

Intraoperative sigmoidoscopy enabled highly accurate diagnosis of proctosigmoid injury. Furthermore, in our series it assisted in avoiding delay in recognizing proctosigmoid injury. Potential benefits of the procedure include the fact that early diagnosis of the injury allowed us to provide intraoperative treatment to all patients by intracorporeal laparoscopic suturing. With development of laparoscopic suture equipment and the increasing experience of surgeons, a larger proportion of bowel injuries are treated by operative laparoscopy^{1,8}; however, laparoscopic management does require surgical skill, and the gynecologic surgeon must not hesitate in this context to consult a surgeon with expertise regarding method of repair.

Sigmoidoscopy may be of further benefit by helping to verify bowel integrity after bowel repair; it allowed us to detect one case of incomplete repair. Adequacy of the repair may be assessed by insufflating the bowel and watching for air bubbles in the fluid-filled cul-de-sac.

An additional benefit is detection of unsuspected bowel pathologies such as rectal polyps. However, of greater clinical relevance in the situations discussed here may be the ability of intraoperative sigmoidoscopy to aid in assessment of bowel wall invasion and potential stricture caused by infiltrating endometriosis. The proctoscope can be used to probe the rectosigmoid to delineate the plane of dissection, assess the extent of disease, and facilitate treatment. Whereas the examination is of use in detecting bowel pathologies, we do not advocate it in the place of preoperative colonoscopy when indicated.

The procedure is safe and easy to perform. Sigmoidoscopy is commonly done by interns and requires minimal training. In fact, obstetric-gynecology residents trained in performing flexible sigmoidoscopy can benefit by gaining experience during endoscopic surgical procedures.¹⁵ In addition, physicians trained to perform sigmoidoscopy during residency are likely to use the procedure in their practice.¹⁶ There is no reason why a gynecologic surgeon should not be able to gain the experience necessary to perform the procedure routinely, especially in the anesthetized patient with direct laparoscopic guidance.

Even when proctosigmoidoscopy was performed immediately after extensive laparoscopic surgical treatment of rectosigmoid endometriosis and adhesions, we had no complications. However, one should be aware of the

clearly increased risk of perforation in such cases due to thinning of bowel wall, just as with rectal probe and other instrumentation.

Intraoperative sigmoidoscopy allows early recognition and treatment of most bowel injuries and may reduce postoperative complications during advanced laparoscopic procedures. Early intraoperative diagnosis and repair of these complications probably best explains the absence of postoperative bowel complications in our series.

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