

Laparoscopic Endocorporeal Mobilization Followed by Extracorporeal Sutureless Anastomosis for the Treatment of Carcinoma of the Left Colon

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Surgery has become progressively more reliant on technology. The technique of colonic anastomosis utilizing the biofragmentable anastomotic ring (BAR) is one such example. The benefits of therapeutic laparoscopy have been applied to the arena of colorectal surgery. A case is presented that combines these two modalities in a patient with colon cancer, laparoscopic mobilization of the large bowel, exteriorized resection, and BAR anastomosis. [Key words: Laparoscopy; Colorectal cancer; Colectomy; Colorectal anastomosis; Surgical technique]

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Technology has made its mark on the science of surgery in the past decade like no other time in history. We have seen the introduction of lasers, mechanical staplers, and biofragmentable anastomotic rings (BARs) to be used instead of sutures. New semantics are changing the surgical vocabulary so that one cannot talk of cholecystectomy without qualifying whether it is performed by the laparoscopic or open route.

We have used a combination of two of these new

techniques in the treatment of a carcinoma of the descending colon. An endocorporeal laparoscopic mobilization of the colon was performed, followed by an extracorporeal resection of the tumor and end-to-end anastomosis by a BAR.

REPORT OF A CASE

A 60-year-old male patient with recurrent abdominal pain underwent a barium enema examination, which revealed an 8 to 10-cm tumor in the descending colon (Fig. 1). At colonoscopy, a large polypoid tumor that almost obstructed the lumen was detected 38 cm from the anus.

Biopsies revealed a well-differentiated adenocarcinoma. Other investigations failed to detect any evidence of distant metastases. The patient had a past medical history of significant hypertension and coronary artery disease, including a myocardial infarction 12 months previously, and left bundle branch block. Cardiac isotope scan showed a decrease in left ventricular contractility with an ejection fraction of 45 percent (n = 50 percent).

TECHNIQUE

On November 19, 1991, under general anesthesia, the patient underwent laparoscopic exami-

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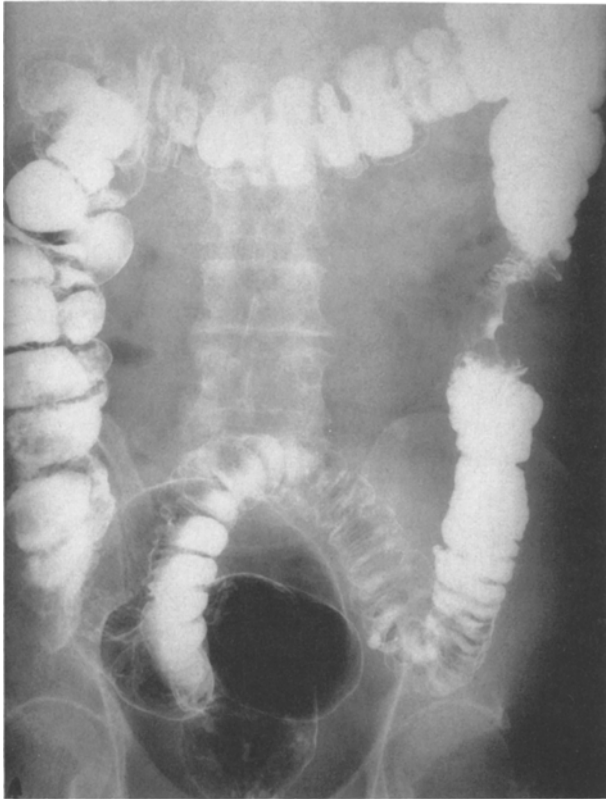


Figure 1. Barium enema demonstrating a carcinoma in the descending colon.

nation. With the patient in the reverse Trendelenburg position, a pneumoperitoneum of 15 mmHg was obtained using a Veress needle. A 10-mm umbilical trocar was inserted, and the patient was then tilted to 30° in Trendelenburg's position. With the operator on the right side of the patient and a TV monitor on the left, a second 10-mm trocar was inserted in the epigastric area. Two more 5-mm trocars were inserted to the left of the rectus muscle. A mobile tumor was located in the upper-to-mid part of the descending colon with no apparent lymph node spread or intra-abdominal metastases.

Using diathermy and scissor dissection, the operation was commenced by incising the lateral peritoneal attachments and clipping and dividing blood vessels at the base of the mesentery from the splenic flexure down to the lower part of the sigmoid colon at its junction with the upper rectum. The abdomen was then opened *via* a muscle-splitting 4-cm transverse skin incision almost at the level of the umbilicus. The peritoneum was incised transversely, and the mobilized descending colon was delivered and resected, including a 5-cm margin above and below the tumor. The diameter of the bowel was measured at 28 mm. A pursestring

suture of 2:0 nylon was applied to both ends of the colon, and an end-to-end anastomosis was fashioned with a 28-mm BAR. The mesenteric defect was closed by a continuous absorbable suture.

At this stage, the bowel was returned to the abdominal cavity and the incision closed in layers. An open perforated latex drain was left in the peritoneal cavity close to the anastomosis.

Finally, the closed abdomen was reviewed laparoscopically, and no bleeding was seen. The integrity of the anastomosis was tested by instilling povidone iodine per anum and observing with the laparoscope, at which time no leak was seen. The trocars were removed and the portals closed with skin adhesive. The total operating time was 180 minutes.

The postoperative course was satisfactory, with bowel movement and liquid diet taken on the first postoperative day. The patient was discharged on postoperative day six because of a fever and medical concern for his cardiac status, although he was eating and defecating normally. Follow-up in the outpatient clinic at five months showed no evidence of recurrence, with normal bowel function and excellent healing (Fig. 2).

DISCUSSION

The accepted management of carcinoma of the large bowel is oncologic resection with a sutured or stapled anastomosis. This is usually performed through a midline or paramedian incision. We describe a case managed in the accepted manner but modified to use two of the newer technologies. First, the left colon was mobilized endocorporeally by a laparoscopic technique. The mobilized colon was then delivered through a minimal abdominal incision and resected. Second, the anastomosis was achieved with a BAR, which facilitates an atraumatic anastomosis of the inverted bowel ends. Although techniques are described where the resection and anastomosis are also done endocorporeally,¹ we felt that the operating time would be reduced and the anastomosis completed more readily extracorporeally. This meant that an additional 4-cm incision was required.

The possible advantages of this technique are: 1) Under the magnified laparoscopic vision, the colonic mobilization is easily done and is virtually bloodless. 2) The small incisions for the trocars and the 4-cm abdominal incision give rise to less pain and earlier mobilization and help to avoid



Figure 2. The patient's abdomen at five months showing excellent healing of the trocar insertion sites and the small surgical wound.

postoperative wound and pulmonary and thromboembolic complications. 3) Early discharge from the hospital and the return of the patient to his/her usual environment and occupation are a cost benefit. 4) The sutureless anastomosis utilizes a polyglycolic acid polymer device that is designed to fragment after tensile strength loss due to polymer hydrolysis. After fragmentation it will pass completely out of the bowel approximately 18 to 30 days postoperatively. Reports have shown that the device is a safe alternative to a sutured or stapled colorectal anastomosis.² One advantage of the BAR is that the absence of metal staples in the anastomotic site prevents a "starburst" effect on follow-up CT examinations. The anastomosis can also be performed in a limited space since no large instru-

ments are required. Anastomotic strength is good, and foreign body reactions are absent.³

However, there are possible disadvantages, which include: 1) The expensive laparoscopic monitors, instruments, and BAR may erode the financial benefits of earlier discharge. 2) Problems such as serosal splitting or pursestring failure may be higher than with sutured or stapled anastomoses, although current reports do not support this.⁴ 3) The longer operating time may have an impact on financial considerations, but concerns over patient tolerance, especially with coexistent disease, have proven to be unfounded. However, with increasing surgical dexterity, the operating time will almost certainly be reduced.

Because of the appeal of this type of anastomosis, we are developing a system to deliver the BAR into the peritoneal cavity without enlarging an incision, placing the device with the aid of an endoscope through the rectum.

CONCLUSION

We present a case of carcinoma of the left colon managed by laparoscopic mobilization and extracorporeal resection with sutureless end-to-end anastomosis. We feel that the utilization of these newer surgical techniques is of interest and, after further use and study, their value in the surgical practice of the future will be determined.

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