

# Laparoscopic Coloanal Anastomosis for Low Rectal Cancer

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## ABSTRACT

**Objectives:** Low anterior resection with hand-sutured coloanal anastomosis for low rectal cancer is technically feasible, and it does not compromise oncologic results. We describe herein the effectiveness of the operation in treating low rectal cancer by a laparoscopic approach followed by intraanal canal dissection.

**Methods:** From February 1999 to October 1999, we used a laparoscopic procedure to divide the inferior mesenteric vessels and to dissect downward into the pelvic cavity as low as possible. A purse-string suture 1-cm distal to the lower margin of the tumor was secured and transection of the rectum was performed circumferentially via the anal canal near the dentate line. The specimen was removed by the pull-through method and coloanal anastomosis was completed with hand suture. A protective loop ileostomy was fashioned.

**Results:** We operated on 8 patients (4 males) with low tumor localization (average 4-cm above the dentate line). The age ranged from 45 to 83 years, with a median age of 64. The average operation time was 210 minutes (150 to 360 minutes), and the average blood loss was 250 cc (minimal to 750 cc). No operative mortalities occurred, but 2 patients had minor anastomotic slough complications. The average hospital stay was 13 days (7 to 26 days). The postoperative pathologic stage was T2N0M0 in 4 patients, T3N0M0 in 2 patients, T2N1M0 in 1 patient, and T3N2M0 in 1 patient. No local recurrence or distant metastasis occurred during the median 14 months (12 to 20 months) of follow-up.

**Conclusion:** Laparoscopic coloanal anastomosis combined with intraanal canal dissection is safe and technically feasible. The oncologic results seem not to be compromised, but need further evaluation.

**Key Words:** Coloanal anastomosis, Laparoscopy, Rectal carcinoma.

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## INTRODUCTION

Indications for sphincter-saving procedures for low rectal cancer have become more frequent because a 2-cm margin is considered sufficient for distal clearance,<sup>1,2</sup> and surgical techniques are improving.<sup>3</sup> In 1982, Parks and Perey<sup>4</sup> anastomosed the colon to the anal canal in patients with rectal cancer. The oncologic results of low anterior resection with coloanal anastomosis for rectal cancer have been reported with pelvic recurrence rates of 5% to 20%.<sup>4-9</sup> Recently, laparoscopic techniques were demonstrated to be as safe as conventional surgical techniques and offer a faster recovery.<sup>10</sup>

Dissection over the true pelvic cavity is still a technical challenge due to the narrow space, especially when the rectum bears the tumor growth. We used intraanal canal dissection following a laparoscopic pelvic dissection technique for low rectal cancer. In this article, we assess the morbidity rate and preliminary oncologic results of this procedure.

## METHODS

Between February 1999 and October 1999, 8 patients received laparoscopic coloanal anastomosis for low rectal cancer in our hospital. Patients were comprised of 4 men and 4 women aged 45 to 83 years (mean: 64 years). Six patients had tumors located in the lower third of the rectum, and 2 patients had tumors located 7 cm above the dentate line. The general data are listed in **Table 1**. All were adenocarcinoma, with moderate differentiation. The distance between the lower end of the distal tumor growth margin and the dentate line ranged from 2 cm to 7 cm, with a median distance of 4 cm.

We used CT scans and intraanal ultrasounds for preoperative staging. We did not use preoperative adjuvant therapy for those patients, but we used postoperative adjuvant radiotherapy for pT3 lesions and chemotherapy for N-positive patients.

The operative technique was as follows: (1) laparoscopic phase: we used the 4-port method: an umbilical port for the scope, a left mid-clavicle line port near the umbilical level, a right mid-clavicle line port near the RLQ level, and a suprapubic midline port. Initially, we dis-

sected and ligated the inferior mesenteric vessels. The sigmoid colon and rectum were mobilized from the medial to the lateral side. Downward dissection toward the pelvic floor to the level of the tumor site was performed as low as possible. In this step, we tried not to squeeze the tumor-burdened rectum. We continued to the next step for full mobilization of the rectum; (2) Intraanal canal phase: we placed a purse-string suture in the rectal mucosa 1-cm distal to the tumor's lower margin. After making the suture secure, Betadine solution was used for the distal rectal washout. Dissection was initiated at the dentate and carried upward into the pelvic cavity. All specimens except 2 were removed using the pull-through method, and a straight coloanal anastomosis was performed with a hand suture at the level of the dentate line. Specimens from the 2 patients with larger tumor burden were removed through a transverse muscle-splitting suprapubic incision enlarged from the suprapubic port; the wound was protected with "Rogan"; (3) a protective loop ileostomy was placed at RLQ from the port site.

## RESULTS

Tumor size ranged from 2 cm to 6 cm, with a median of 4 cm in size (**Table 1**). The postoperative pathologic stage was T2N0M0 in 4 patients, T3N0M0 in 2 patients, T2N1M0 in 1 patient, and T3N2M0 in 1 patient. The distal, mesorectal, and lateral margin of the specimen were all free of tumor tissue. No operative mortalities occurred.

Two patients had the complication of minor slough of the anastomosis. No further surgical intervention was needed. The wounds healed with conservative management, but 1 patient had an anal stenosis that required anal dilatation. Operation time ranged from 150 minutes to 360 minutes, with a median of 210 minutes, and the average blood loss was 250 cc (minimal to 750 cc). The average in-hospital stay was 13 days (7 to 26 days). All patients were followed regularly at 3-month intervals with carcinoembryonic antigen, CT scans, and digital examinations. During the short follow-up period of 14 months (12 to 20 months), no local recurrence or distant metastasis occurred.

## DISCUSSION

The surgical technique of coloanal sleeve anastomosis inaugurated by Parks in 1972<sup>11</sup> and Parks and Percy in 1982<sup>4</sup> is gaining clinical acceptance. Several studies have demonstrated a 5-year disease-free survival ranging from 56% to 79%.<sup>9,12-14</sup> The local recurrence rate ranged from 7% to 23%.<sup>5-7,9,12-14</sup> Meanwhile, a distal resection distance of 2 cm in low rectal cancer has been accepted by many authors. Nowadays, ultralow sphincter-saving rectal resection with coloanal anastomosis is an oncologically reliable and accepted treatment for rectal cancer, even in the lower one third of the rectum.

Laparoscopic-assisted colectomy has been applied to

**Table 1.**  
Gender, Age, Tumor Differentiation, Postoperative Stage, Tumor Size, and Distance Between the Distal Tumor Margin and the Dentate Line

Age/Sex	Tumor Differentiation	Postoperative Stage	Tumor Size	Distance Between Distal Tumor Margin and the Dentate Line
78/F	Moderately	T2N0	2.2x2cm	4cm
45/M	Moderately	T2N0	4.4x3.8cm	2cm
83/F	Moderately	T3N0	5x3.7cm	7cm
60/M	Moderately	T2N0	3x3cm	4cm
52/M	Moderately	T2N0	4x3cm	3cm
59/F	Moderately	T3N0	3x2cm	6cm
69/M	Moderately	T3N2	6x4cm	4cm
63/F	Moderately	T2N1	6x3.3cm	3cm

patients with colorectal cancer for years. In 1998, Milsom et al<sup>10</sup> conducted a prospective, randomized trial comparing laparoscopic versus conventional techniques in colorectal cancer surgery. He emphasized that laparoscopic techniques were as safe as conventional surgical techniques and offered a faster recovery of pulmonary and gastrointestinal function compared with that in conventional surgery for select patients undergoing large bowel resection for cancer or polyps.

We began laparoscopic-assisted operations for colorectal cancer in July 1998. It was not until the tenth patient that we performed a sphincter-saving operation for lower rectal cancer. We used intraanal dissection combined with the laparoscopic technique described previously. The key point of this procedure is secure placement of a purse-string suture distal to the tumor to prevent seeding of malignant cells, and trying not to cause perforation during intraanal canal dissection. The main advantages are good access to the pelvic cavity and dissection around the tumor-bearing rectum. With smaller sized tumors, the specimen could be removed from the anal canal by the pull-through method to achieve better cosmetic results. For larger tumors, a transverse Pfannenstiel incision must be created through the suprapubic port with the muscle-splitting method for removal of the specimen. Good cosmetic results can also be obtained in this circumstance. The 2 stage III patients had lymph node clearance in 5/27 and 1/10, respectively. Postoperative radiotherapy was applied to the 2 T3 patients, and chemotherapy was used for the 2 lymph node-positive patients. No local recurrence has occurred in this short follow-up, but long-term follow-up for reliable oncologic information is needed.

## CONCLUSION

Laparoscopic coloanal anastomosis combined with intraanal canal dissection is safe and technically feasible. Oncologic results seem not to be compromised, but further long-term evaluation is required.

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