

Long-Term Outcome of Laparoscopic Colectomy for Benign Tumors of Colon and Rectum

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Abstract : Background : Laparoscopic surgery has led to great progress in the treatment of many gastrointestinal diseases. Many reports of laparoscopically colorectal surgery suggest that the same surgical treatment can be performed laparoscopically as performed by open procedure. The studies published to date report only the outcomes of laparoscopic surgery for patients with cancer. However, none of these reports described the short and long-term outcome of laparoscopic surgery for patients with benign tumors of the colon and rectum. We herein describe the long-term outcome for patients with laparoscopic colectomy for benign tumors of the colon and rectum. Methods : Thirty-one patients with benign tumors of the colon and rectum underwent laparoscopic surgery between 1995 January and 2004 December at the Second Department of Surgery, Fukuoka University Hospital. The mean age of the patients was 63.2 years old (range 28-89). Data were collected prospectively concerning the length of time before liquid and solid food intake, the length of hospital stay, intraoperative accidents, and postoperative complications. The patients were followed at an outpatients clinic for one month, and 3-6 months after the operation. Results : The median follow-up was 27.6 months (range 4.3-108.5 M). Twenty-seven Patients were diagnosed to have adenoma while two patients were diagnosed lipoma of submucosal tumor. The other patients demonstrated a hyperplastic polyp and a juvenile polyp, respectively. One of the patients had to be converted to open surgery because of intraabdominal adhesion. The mortality rate was 0%. The overall morbidity was 0%. One patient had minor complications (3.1%) ; one urinary disturbance. No patients presented with major complications. Conclusions : Our surgical experience with a laparoscopic colectomy for benign tumors of colon and rectum therefore seemed to be a feasible and useful procedure for both of younger and elderly patients.

Key words : laparoscopic colectomy, laparoscopic surgery, benign tumors of the colon and rectum, Long-term outcome

Introduction

Laparoscopic surgery has led to great progress in the treatment of many gastrointestinal diseases.¹⁾ Laparoscopic surgery of the colon and rectum has now been shown to be feasible and safe for

cancer surgery.¹⁾⁻⁸⁾ As a result, many reports of laparoscopically colorectal surgery suggest that the same surgical treatment can be performed laparoscopically as performed by open procedures. On the other hand, the development of colonoscopy and skill of its practice is also leading to detection of various and small lesions. Endoscopic mucosal

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resection and open surgery have been a common treatment for those lesions before the development of laparoscopic surgery. However, open surgery is a too invasive treatment for the patients with lesions that can be endoscopically resected. Therefore a new treatment modality between those two treatments is required for those lesions. Laparoscopic surgery is now placed in a therapeutic position between those two treatments. However, the studies published to date report only the outcomes of laparoscopic surgery for patients with cancer. The long (and short)-term results of benign tumors of the colon and rectum still remain to be elucidated. None of the reports have described the short and long-term outcome of laparoscopic surgery for patients with benign tumors of the colon and rectum. Since 1995, we have performed laparoscopic surgery for those patients to investigate the long-term outcomes.

Patients and methods

Thirty-one patients with benign tumors of the colon and rectum underwent laparoscopic surgery between 1995 January and 2004 December at the Second Department of Surgery, Fukuoka University Hospital. The mean age of the patients was 63.2 years old (range 28–89). Prior to the operation, informed consent was obtained, and all patients were evaluated by clinical investigations including total colonoscopy and double-contrast barium enema. Magnifying colonoscopy, dye colonoscopy, and endoscopic ultrasound were used in most patients to evaluate tumor spread. Chest radiography, abdominal ultrasonography and/or computed tomography of the abdomen including the pelvic area were performed when if necessary in all patients.

Data were collected prospectively concerning the length of time before liquid and solid food intake, the length of hospital stay, intraoperative accidents, and postoperative complications. The abdominal wounds were inspected daily until discharge, and then were followed for one month after the operation. Complications and reasons for exclusion were recorded and analyzed. Pathological examinations for each resected specimen were performed. Patients were followed at an outpa-

tient clinic for one month, and 3–6 months after the operation.

Surgical technique

The preparation of the patients for surgery was the same as for conventional colorectal surgery. Laparoscopic procedures were performed under general anesthesia with the patients in the supine or lithotomy position. The basic laparoscopic procedures used for our laparoscopic surgery was a technique described by Zucker et al.¹⁴⁾ Pneumoperitoneum was established by the open laparotomy technique through a supra/intra-umbilical incision used for the laparoscopy port. The appropriate segment of the ports, which was extended to a length of approximately 4 cm, and the bowel and the vascular supply was divided extracorporeally with the limited lymph node dissection if necessary. The bowel was delivered through a small incision and then was divided extracorporeally, and an end-to-end anastomosis was performed except for those in the rectosigmoid, where extracorporeal anastomosis was considered to be impossible. For tumors in the rectosigmoid, the distal rectum was divided intracorporeally using a laparoscopic linear stapler after intracorporeal division of the inferior mesenteric vessels, and the proximal end of the bowel was then delivered through a small incision. The bowel was resected extracorporeally, after which an anvil was placed into the proximal colon and an anastomosis was performed intracorporeally using the double-stapling technique.

Results

Thirty-one patients underwent a laparoscopic colorectal resection between January 1995 and December 2004. The median follow-up was 27.6 months (range 4.3–108.5 M). The indications for laparoscopic colectomy are indicated in Table 1. Twenty-seven patients were diagnosed to have adenoma and two patients were diagnosed to have lipoma with a submucosal tumor. The other patients demonstrated a hyperplastic polyp and a juvenile polyp, respectively. One of the patients had to be converted to open surgery because of intra-

Table 1. The Indications for patients undergoing a laparoscopic colectomy

No.	Age	gender	Location	macroscopic	size (mm)	histology
1	73	M	T	Ip	10×10	hyperplastic
2	70	F	A	IIa	26×14	adenoma
3	73	M	A	Ip	25×19	adenoma
4	73	F	A	Isp	25×18	adenoma
5	89	F	S	Is	30×22	adenoma
6	72	F	A	IIa	20×15	adenoma
7	66	M	T	IIa	15× 8	adenoma
8	50	M	S	IIa	12×11	adenoma
9	78	F	A	IIa	28×16	adenoma
10	79	F	S	Isp	15×15	adenoma
11	56	M	S	Isp	73×35	adenoma
12	71	F	S	Isp	25×15	adenoma
13	60	F	T	Isp	21×15	adenoma
14	28	M	D	Is	15×12	juvenile
15	63	M	D	IIa	20×10	adenoma
16	66	M	D	Is	30×10	adenoma
17	69	M	S	Isp	10× 5	adenoma
18	78	F	C	Is	45×39	adenoma
19	47	M	S	Ip	50×35	adenoma
20	59	F	S	SMT	30×30	lipoma
21	59	M	D	IIa	19×15	adenoma
22	44	F	A	LST	40×30	adenoma
23	53	F	A	SMT	65×30	lipoma
24	63	M	C	LST	30×17	adenoma
25	55	F	S	Isp	27×17	adenoma
26	41	M	T	Isp	30×30	adenoma
27	74	F	C	Ia	16×15	adenoma
28	50	F	A	LST	10× 5	adenoma
29	80	M	S	LST	22×15	adenoma
30	62	M	S	Isp	23×18	adenoma
31	58	F	R	Isp	19× 7	adenoma

abdominal adhesion. The mortality rate was 0%. The overall morbidity was 0%. One patients had minor complications (3.1%); one had urinary disturbance. No patients presented with major complications (Table 2). None of the patients required a reoperation. None of the unsatisfactory results such as wound pain, incisional hernia, bowel obstruction, and any other complications after the operation were reported by the patients.

Discussion

No previous reports have described the short and long term outcome of laparoscopic surgery for benign colorectal tumors. We herein report the long term outcome of laparoscopic surgery for benign tumors. At the beginning of our laparoscopic practice for lesions of the colon and rectum, we performed this procedure only for patients with benign polyps and Tis cancer (carcinoma in situ). We gradually expanded our indications to include advanced cancer after the establishment of im-

proved techniques. Laparoscopic surgery is now performed successfully for patients with colon disease who require surgical management all over the world. However, at the beginning period of the laparoscopic colorectal surgery, complications such as port site recurrence of a cancer associated with this procedure were reported. Thereafter, surgeons performing laparoscopic surgery began to be careful of port site recurrence. However, such problems caused a transient drop in enthusiasm for this modality. This concern has been overcome by evidence indicating that laparoscopic colorectal surgery is safe for patients with advanced cancer, and the enthusiasm for laparoscopic colectomy has thus since returned. Laparoscopic surgery in the treatment of colorectal cancer is now believed to be sufficiently safe because earlier reports of a risk of port site recurrence have not been substantiated in recent studies.

As a result, surgeons who develop laparoscopic surgery of the colon and rectum have been paying close attention to the prevention of the port site

Table 2. Patients undergoing a laparoscopic colectomy for benign tumors of the colon and rectum

No.	laparoscopic procedure	converted to open	complication	hospital stay	outcome
1	transverse colectomy	no	none	12 days	16.3 M alive
2	ascending colectomy	no	none	23 days	4.3 M alive
3	ascending colectomy	no	urinary disturbance	15 days	92.5 M alive
4	ascending colectomy	yes	none	18 days	17.2 M alive
5	sigmoidectomy	no	none	14 days	4.6 M alive
6	ascending colectomy	no	none	15 days	5.6 M alive
7	transverse colectomy	no	none	22 days	37.5 M alive
8	sigmoidectomy	no	none	75 days	37.2 M alive
9	ascending colectomy	no	none	11 days	50.1 M alive
10	sigmoidectomy	no	none	14 days	108.5 M alive
11	sigmoidectomy	no	none	16 days	30.3 M alive
12	sigmoidectomy	no	none	14 days	33.5 M alive
13	transverse colectomy	no	none	18 days	49.9 M alive
14	discending colectomy	no	none	12 days	15.2 M alive
15	discending colectomy	no	none	12 days	37.9 M alive
16	discending colectomy	no	none	14 days	30.4 M alive
17	sigmoidectomy	no	none	12 days	37.4 M alive
18	ileocecal resection	no	none	14 days	37.9 M alive
19	sigmoidectomy	no	none	14 days	5.9 M alive
20	sigmoidectomy	no	none	12 days	29.9 M alive
21	discending colectomy	no	none	13 days	24.5 M alive
22	ascending colectomy	no	none	14 days	36.1 M alive
23	ascending colectomy	no	none	12 days	36.7 M alive
24	ileocecal resection	no	none	14 days	12.9 M alive
25	sigmoidectomy	no	none	14 days	49.7 M alive
26	transverse colectomy	no	none	11 days	5.2 M alive
27	ileocecal resection	no	none	18 days	49.6 M alive
28	ascending colectomy	no	none	18 days	23.3 M alive
29	sigmoidectomy	no	none	15 days	6.9 M alive
30	sigmoidectomy	no	none	14 days	22.2 M alive
31	anterior resection	no	none	16 days	11.5 M alive

recurrence. On the other hand, factors which prolong the length of hospital stay have been indicated due to various postoperative complications such as bleeding, wound sepsis, pelvic abscess, bowel obstruction and anastomotic leakage.⁷⁾⁸⁾ Most patients understand that less invasive procedures such as laparoscopic surgery are safe, and lead to a shorter hospital stay and earlier return to their regular lifestyle. If intraoperative accidents or postoperative complications occur, they may those sometimes confuse patients. Adequate informed consent is thus necessary to avoid a divergence of such views. The incidence of wound sepsis in our department is low because we have instituted a policy of wound protection using a wound protector during laparoscopic surgery and an occlusive drape after the operation. Therefore such complications are not serious. The most serious complication is, of course, operative and postoperative death. Anastomotic leakage is also serious. Fortunately, we have never experienced those complications. The incidence of anastomotic

leakage of laparoscopic colectomy is generally lower than that of laparoscopic anterior resection.⁷⁾ Complete preoperative preparation and adequate treatment of associated disease such as diabetes mellitus, cardiac disease, pulmonary disease, and other diseases rule out most complications.

The reason for the relatively limited number of patients with rectal tumors in this study was due to the application of transanal endoscopic microsurgery (TEM). We have actively introduced TEM for patients with polyps and mucosal cancer in the rectum since 1994. Mucosal lesions in the upper rectum at the site of approximately 20 cm from the anus can be removed by TEM. For this reason, a laparoscopic anterior resection of the rectum for a benign lesion was not performed during this period.

The increased experience of laparoscopic surgery has led to a laparoscopic colectomy and anterior resection becoming equivalent to, or even better than, open procedures. As a result, the incidence

of complications after laparoscopic colorectal surgery has now become lower than that for open colorectal surgery. However, any complications, requiring a reoperation and a prolonged hospital stay, may become a heavy problem for patients who initially believe that laparoscopic surgery is less invasive. It is important to obtain the informed consent so that conversion to open surgery should not be disadvantageous for the patients who were underwent the laparoscopic surgery without intraoperative accidents or postoperative complication. Therefore, to prevent the occurrence of injuries, a decision to convert to open surgery should be made without hesitation when surgeons experience difficulty in performing laparoscopic surgery. It has been suggested that improved morbidity, a decrease in the amount of analgesics, an earlier return to a normal diet, and a shorter hospital stay are major benefits of minimally invasive surgery.⁹⁾¹⁰⁾ Our mean hospital stay in this study was 14.7 days, which is longer than that reported in Europe and the United States in patients with a malignant disease.¹³⁾ Japanese patients tend to stay longer in hospital because the Japanese socialized medical insurance system covers the complete cost of the hospital stay. The length of hospital stay after conventional surgery in Western countries is also much shorter than in Japan.^{10)–12)} As a result, the length of hospital stay is not yet a major concern for either Japanese patient or surgeons. Nevertheless, shortening the length of hospital stay after laparoscopic colectomy might be possible from a medical view point. The long term outcomes after laparoscopic surgery for patients with a benign tumors of the colon and rectum should also be clarified the same as for patients with cancer because such evidence is important for surgeons who are practicing evidence based medicine. There is only one report⁷⁾ of long-term outcomes after laparoscopic surgery for stage T1 colorectal cancer which has recently been established, and it might be included as a similar result as that for benign tumors. However, such findings are not considered to be evidence of laparoscopic surgery for benign tumors of the colon and rectum. This study might be the first report describing the long-term outcomes of the patients with benign tumors, and our findings indi-

cate that laparoscopic surgery for benign tumors of the colon and rectum is feasible and safe. However, laparoscopic surgery is a surgical treatment in itself. Therefore, surgeons must be careful of the fact that laparoscopic surgery might cause some complications due to normal statistical probability. Therefore, adequate informed consent is also necessary to obtain when performing laparoscopic surgery in patients with benign tumors the same as in patients with cancer.

Conclusions

Our surgical experience with a laparoscopic colectomy for benign tumors of colon and rectum therefore appears to be a feasible and useful procedure for both of younger and elderly patients.

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