

Laparoscopic Colectomy in the Management of Large, Sessile, Transformed Colorectal Polyps

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ABSTRACT

Background: Colonic polyps are usually removed endoscopically. Surgical intervention is reserved for large, inaccessible colorectal polyps that have undergone malignant transformation. Laparoscopic management of colonic polyps has gained a well-defined role.

Methods: Since 1993, 650 laparoscopic colectomies have been performed in our department. Twenty-eight patients with large, sessile, polyps that have undergone malignant transformation underwent elective laparoscopic colectomy. Operative procedures included 14 sigmoidectomies, 10 low anterior recto-sigmoid resections, 3 right colectomies, and 1 left colectomy. Central ligation of vessels and lymph node dissection were performed in all patients.

Results: The main outcome measures include conversion rate (11%), morbidity (11%), and mortality (3.5%). The mean return of bowel function was 3.1 days, liquid intake 1.4 days, solid food intake 2.5 days, and mean hospital stay 8 days. The mean specimen length was 23 cm, and the mean number of retrieved lymph nodes was 15. Malignancy according to Dukes classification was in situ, n=4; A, n=15; B, n=4; C, n=4; and D, n=1. During follow-up, 2 patients developed liver metastases.

Conclusion: Laparoscopic colectomy is a technically feasible and effective method for treating large colorectal polyps that have undergone malignant transformation.

Key Words: Laparoscopy, Colectomy, Colonic polyps, Colorectal cancer.

INTRODUCTION

Laparoscopic colectomy presents a challenge even for an experienced laparoscopic surgeon. The technical difficulties of the procedure are accentuated by the presence of malignant disease. However, advantages arising from safety,¹⁻³ outcome, and cost effectiveness,⁴ have established laparoscopic colon resection as the most preferred method in benign colonic conditions, particularly diverticulitis,⁵⁻⁷ inflammatory bowel disease,⁸⁻¹¹ familial adenomatous polyposis,¹² and Hirschsprung's disease.¹³

The issue of laparoscopic treatment of patients with colorectal cancer remains controversial.¹⁴⁻¹⁶ Debate exists concerning the oncologic and immunologic advantages of laparoscopic access,^{17,18} the radicalness and extent of resection and the potential for port-site recurrence.¹⁹ Until large randomized prospective studies give definitive information and determine firm directives, the questions will remain unanswered.

Endoscopic removal of colonic polyps is currently the standard of care, with surgery being reserved for inaccessible or malignantly transformed polyps. Traditional approaches include laparotomy followed either by colotomy and polypectomy or by colonic resection. Recently, laparoscopic-assisted colonoscopic polypectomy has been described.²⁰⁻²⁷ This method consists of laparoscopic colon mobilization to avoid the risk of perforation in cases of large and inaccessible polyps.²⁰⁻²⁷ However, the procedure is not technically feasible in a large number of patients²⁴ and is excluded in cases of suspected or established malignancy. Laparoscopic colonic resection has been proposed in case of endoscopic failure due to site, size, and the broad base of the tumor or the development of malignant transformation.²⁸⁻³² In cases with polyp size up to 2.5 cm, the possibility of malignancy is well above 30% for colonic and 50% for rectal locations.²⁸ The problem of choosing the appropriate treatment is accentuated by often-negative histopathologic results obtained by endoscopy in cases of macroscopically suspicious lesions.

The present study describes our experience with laparoscopic colectomy in 28 patients presenting with colorectal polyps with malignant transformation. Indication for sur-

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gery, technical aspects, histopathological findings, and the short- and long-term outcomes are discussed.

METHODS

From October 1993 to February 2002, 650 laparoscopic colectomies were performed including 200 procedures for colorectal cancer. The study group consists of 28 patients with large, sessile, colorectal polyps that have undergone malignant transformation. Fifteen men (mean age, 68) and 13 women (mean age, 64) were referred to our department because of endoscopic findings. Colonoscopic removal was considered unsuitable in 19 cases due to a size of 2.5 cm, a broad base, or inaccessible location. Three patients presented with co-existing diverticular disease. Endoscopic biopsies confirmed malignancy in 13 patients, while in 9 patients a variable degree of dysplasia was found. The remaining 6 patients had been referred for management due to the presence of malignant infiltration at the base of the polyp confirmed by previous endoscopic removal. A computed tomographic (CT) scan revealed liver metastases in one patient. **Table 1** lists the number and locations of polyps. Patients were classified by anesthetists as ASA I (n=6), ASA II (n=17), ASA III (n=3), ASA IV (n=2).

All patients underwent colonic preparation and received 2 g of Ceftriaxone as a single dose of antibiotic prophylaxis at the induction of anesthesia. **Table 2** lists the number and types of operations performed and the operative times for each procedure. With the patient in the lithotomy position, the operation was performed with 5 trocars, an intraabdominal pressure of 12 mm Hg, a zero-degree laparoscope, and the UltraCision Harmonic Scalpel (Ethicon, Cincinnati, OH, USA) for mobilization of the colon. An oncological “no-touch” laparoscopic approach was followed in all patients. Localization of the polyp was based on accurate preoperative determination of the distance from the anus, methylene blue staining, as well as intraoperative inspection for serosal changes. Central li-

Table 1.
Location and Number of the Polyps

Location	Number
Sigmoid	16
Rectum	8
Cecum	2
Hepatic flexure	1
Left transverse	1

Table 2.
Performed Operations and Operative Times

Operation	Number	Mean Time (min)	Range (min)
Sigmoid resection	14	180	110–270
Low anterior resectosigmoidectomy	10	317	180–500
Right colectomy	3	180	150–210
Left colectomy	1	255	
Total	28	236	110–500

gation of the mesocolic vessels by using metal clips and adequate dissection of lymph nodes were performed in all patients. The colonic segment was exteriorized through a protected left-sided mini Pfannenstiel, or right-sided McBurney incision and excised. For right colonic resections, an extracorporeal ileo-transverse anastomosis was performed, while for left-sided resections, an intracorporeal anastomosis was fashioned using a circular stapler. The oncology team of the hospital regularly followed all patients.

RESULTS

The planned laparoscopic procedure was accomplished successfully in all but 3 patients in whom a conversion to open surgery was considered necessary (conversion rate 11%). The reasons for conversion were an uncontrolled venous hemorrhage from a branch of the iliac vein, instrument failure in a low anterior recto-sigmoid anastomosis, and a failure to localize the lesion despite the previously described methods for localization of the lesion. The mean duration of the operation for each laparoscopic resection is shown in **Table 2** and the short-term outcome in **Table 3**.

All patients but 3 recovered well and had an uneventful postoperative course. Three postoperative complications

Table 3.
Short-term Outcomes*

Parameter	Mean Time (days)	Range (days)
First bowel movement	3.1	1–9
Liquid intake	1.4	1–3
Solid food intake	2.5	1–4
Hospital stay	8	4–32

*Conversion rate=11%; morbidity rate=11%.

were encountered (perioperative morbidity 11%). One patient was reoperated on after 5 hours because of abdominal wall hemorrhage secondary to trocar insertion. The second patient was reoperated on the 12th postoperative day because of intestinal obstruction due to adhesions. The third patient, a 74-year-old woman presenting with a rectal Dukes B carcinoma, was reoperated on on the fourth postoperative day, because of anastomotic leakage and hemorrhage. A diverting colostomy was performed, but the patient died from sepsis and multiple organ failure (mortality rate 3.5%).

The first bowel movement was observed after 3.1 days (range, 1 to 9), liquid food intake was initiated after 1.4 days (range, 1 to 3), and solid food intake after 2.5 days (range, 1 to 4).

The mean duration of postoperative hospital stay was 8 days (range, 4 to 32). The 32-day stay involved a patient with cardiac arrhythmia and ASA class IV status.

The mean length of resected specimens was 23 cm (range, 14 to 48), and the mean number of lymph nodes retrieved was 15 (range, 1 to 33). The histopathology study confirmed adenocarcinoma in all cases, classified according to Dukes stage as shown in **Table 4**.

During the follow-up period, 3 major complications occurred. One patient presented with intestinal obstruction 28 months postoperatively due to adhesions. A second patient developed hepatic metastases 18 months later. This patient was initially rated as ASA IV and operated on for an adenovillous sigmoid polyp (3 x 2.5 x 1.2 cm), Dukes A with 12 free lymph nodes retrieved, and a 19-cm specimen resected. A third patient experienced hepatic and peritoneal metastases 6 months later. However, this patient's history included previous surgery for uterine cancer before being referred to our department. She was operated on for a villous rectal polyp (3.5 x 3.8 cm),

Dukes A, with 27 free lymph nodes retrieved on a 25-cm long specimen.

DISCUSSION

The standard management of benign colorectal polyps is endoscopic removal using an electrosurgical diathermy device. Large polyps require adequate exposure of the base and easy manipulation for snaring. In case of endoscopy failure or when malignancy is suspected, a surgical excision should be performed. Surgical options include colectomy in case of pedunculated polyps and limited colectomy in case of large, broad-base polyps. Polyps that have established or even possible development of malignant transformation require an oncological resection of the affected colon. This could possibly involve a laparoscopic approach, and the surgeon must be aware of all treatment modalities.³¹

Laparoscopic management of colorectal polyps appears to be superior to conventional open surgery as regards postoperative pain, return of bowel function, and return to normal activity. However, it takes more time and a shorter specimen is removed.³⁰ The most difficult and time-consuming procedure was low anterior recto-sigmoidectomy. The resected specimen and retrieved lymph nodes determine the extent and radicalness of the excision and relate directly to surgical expertise.

For the above-mentioned reasons, laparoscopic oncologic colectomy was considered the procedure of choice for treating large, sessile, transformed polyps. Histopathologic study confirmed the diagnosis of adenocarcinoma in all cases, revealing 19 out of 28 cases with in situ or Dukes A carcinoma (68%). The mean operative time, the mean hospital staying (8 days), the conversion rate (11%), the morbidity rate (11%), the mortality rate (3.5%), the mean length of the specimen (23 cm), and the mean number of lymph nodes¹⁵ are acceptable and in accordance with data reported by others.^{1,3,4,15,29,30,33} Conversion rates vary between studies. An overall rate of 15.8% from 28 studies with 3232 patients has been reported.³³ The risk factors for conversion include left colectomy, anterior rectal resection, diverticulitis, and cancer. However, it should be stressed that laparoscopic colectomy requires advanced laparoscopic skills, and additional training is mandatory.³⁴

In this study, the anastomosis for left-sided resection was performed intracorporeally with a stapling device, although a hand-sewn procedure for this has been described.³⁵ It seems that intracorporeal anastomotic techniques are superior to the extracorporeal one, mainly

Table 4.
Pathological Findings*

Dukes Classification	Number
In situ	4
A	15
B	4
C	4
D	1

*Mean length of specimen=23 cm (range 14–48 cm); mean number of lymph nodes=15 (range 1–33).

because the length of the removed colon is longer. Regarding the long-term outcome of this study, 2 patients subsequently presented with liver metastases after 6 months and 18 months, respectively. That was despite early cancer stage (Dukes A) and the potentially curative oncological resection. It is probable that the prognosis of colorectal cancer depends more on the biological behavior of the tumor than on any other factor.

CONCLUSION

In conclusion, we would say that the established advantages of the laparoscopic colectomy have been observed in this study. A standard oncological laparoscopic approach is essential for large, transformed polyps as well as for small colonic cancers. It is safe, reproducible, with comparable short- and long-term outcome, and could present a new criterion standard. However, a sufficient learning curve period and teamwork are the keys for this technically demanding operation to diminish postoperative morbidity and mortality.

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