



Original Article

Comparison of laparoscopic versus open surgery in a three-stage operation for obstructive left-sided colorectal cancer

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Abstract

Background: Treatment for obstructive left-sided colorectal cancer (OLCC) typically consists of a three-staged procedure. During the first stage, the obstruction is managed with diversion colostomy. Traditionally in the second stage, we perform open resection for the primary tumor. In this study, we evaluated the feasibility of laparoscopic resection of OLCC with diversion colostomy in terms of operative results and short-term outcomes.

Methods: A total of 20 patients underwent laparoscopic resection for OLCC (study group), 48 patients underwent open resection for OLCC (control group 1), and 53 patients underwent laparoscopic resection for non-OLCC (control group 2). Afterwards, results from the procedures were obtained and clinical data were analyzed.

Results: The operative time was significantly longer in the study group than in the control group 1 (153 minutes vs. 126 minutes, $p = 0.041$), and the length of hospitalization was shorter in the study group than in the control group 1 (5.3 days vs. 7.6 days, $p = 0.032$). Regarding the operative results and short-term outcomes, there were no significant differences between the study group and control group 2. Colostomy retraction was a specific morbidity which occurred in two patients of the study group.

Conclusion: Laparoscopic resection of OLCC with diversion colostomy is feasible. Abdominal cavity adhesion is only limited. We strongly recommend that laparoscopic resection should be performed at least 2 weeks after diversion colostomy, and the plastic rod should be left in place during the pneumoperitoneum to reduce the risk of colostomy retraction.

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1. Introduction

Up to 20% of patients with colorectal cancer (CRC) present with symptoms of acute, complete, or partial obstruction.^{1–4} It is generally accepted that obstructive right-sided CRC can be

treated with right hemicolectomy and ileocolic anastomosis, resolving the obstruction and cancer at the same time.² Meanwhile, the optimal treatment for obstructive left-sided colorectal cancer (OLCC) remains controversial.^{5–7} However, several options for OLCC are available⁸: (1) diversion colostomy and subsequent resection (two or three-staged procedure); (2) primary resection with anastomosis or without anastomosis (Hartmann's procedure); and (3) colonoscopic stenting by self-expanding metallic stents for palliation or bridge to resection.

In our hospital, the first choice for OLCC is the conventional three-staged procedure. During the first stage, the

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obstruction is managed with the diversion colostomy. The second stage takes place a few weeks later when the tumor is resected and the colostomy is closed (2-stage procedure) or, alternatively, the colostomy can be closed at a third stage. Traditionally in the second stage, we perform open resection for OLCC. Recently, laparoscopic resection has become an accepted therapeutic option for treating patients with CRC after the publication of large randomized trials that confirmed the safety and oncologic equivalency of this procedure with open resection.^{9,10} In patients with diversion colostomy, the concern for laparoscopic surgery is the possibility of abdominal cavity adhesion and bowel distention, which may preclude laparoscopic resection.¹¹ However, some studies have mentioned that previous abdominal surgery is not a contraindication for laparoscopic CRC surgery.^{12–14}

In a review of literature, we found few reports regarding the laparoscopic resection of OLCC with diversion colostomy. Therefore, in this retrospective study, we evaluated the feasibility of laparoscopic resection in this group of patients in terms of operative results and short-term outcomes.

2. Methods

We conducted a retrospective case-control study by reviewing the charts of patients with OLCC between January 2005 and December 2013 at Kaohsiung Veterans General Hospital, Kaohsiung, Taiwan consecutively. Ultimately, a total of 109 patients were enrolled. Patients receiving only diversion colostomy ($n = 11$), one-staged resection of tumor without diversion colostomy ($n = 9$), neoadjuvant concurrent chemoradiation therapy for middle to lower rectal cancer ($n = 8$), stage IV with unresectable metastasis ($n = 7$), or poor performance status with an Eastern Cooperative Oncology Group score > 3 ($n = 6$) were excluded from this

study. All the patients included in this study first received diversion colostomy followed by resection of the obstructive tumor.

We performed traditional open resection and a total of 48 patients were initially enrolled (control group 1). After January 2010, we began performing the laparoscopic resections and a total of 20 patients were enrolled (study group 1). During the same period (from January 2010 to December 2013), those patients with nonobstructive left-sided CRC receiving laparoscopic resection were also included and a total of 53 patients were enrolled (control group 2).

2.1. Surgical technique

We performed diversion colostomy over the proximal transverse colon in most of the cases (Figs. 1A and 1B). In some cases with obstructive tumor over the splenic flexure or descending colon, we performed diversion colostomy over distal transverse colon due to the possibility of simultaneous resection of primary tumor and colostomy. After the colostomy was exteriorized, we routinely inserted a plastic rod through the mesentery to ensure a complete diversion of stool and to avoid colostomy retraction (Fig. 1C). Resection of the OLCC was performed 10–20 days after diversion colostomy.¹⁵

Whether the procedure involved open or laparoscopic resection, the same no-touch isolation technique and the so-called “medial-to-lateral” approach was performed. The dissection begins with high ligation of the inferior mesenteric artery at its origin from the aorta. The sigmoid colon and rectum is then mobilized as far down as possible on its posterior and right lateral surfaces before opening the anterior rectal space from the right to the left, extending from the Pouch of Douglas. Anastomosis is then performed by using



Fig. 1. (A) A 60-year-old man presented with obstructive sigmoid colon on a computed tomography scan (arrow); (B) loop colostomy was created over the proximal transverse colon at the right upper quadrant of abdomen; (C,D) laparoscopic resection was performed 2 weeks later after loop colostomy. The plastic rod (arrowhead) should be left in place to avoid colostomy retraction during pneumoperitoneum; (E) after well-draping of the colostomy, pneumoperitoneum and trocar insertion could be created safely during the laparoscopic surgery; (F) only limited adhesions around the colostomy; and (G) colostomy retraction during the laparoscopic resection.

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