

LAPAROSCOPIC COMPLETE MESOCOLIC EXCISION IN RIGHT COLON CANCER: RESULTS OF 74 CASES

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SUMMARY

Surgery is the most important indication for radical treatment of colon cancer and the long-term results can be improved by improving the surgical treatment. Objectives: To assess the clinical outcomes of laparoscopy for right colon cancer. Subject and method: The database was created by retrospectively reviewing hospital of the patients who underwent laparoscopic right hemicolectomy in 108 Military Central Hospital (from April 2015 to June 2018). Results: Tumor site often occurred at ascending colon and hepatic flexure (66.2%). Patients commonly were operated at stages I - II based on pathology (70.3%). The median size of tumor was 4.8 ± 1.8 cm. Lymph node harvest was 19.7 ± 7.1 . The rate of positive lymph nodes was 28.4%. The average of operation time was 105.7 ± 30.5 minutes. The mean time of hospital stay was 8.7 ± 2 days. Two patients (2.8%) were converted to open surgery. The rate of postoperative complication was 9.7%. There was one case of anastomotic leakage, three cases with surgical site infection and one case of postoperative mortality. The three-year overall survival rate of all stages was 91.9%. The 3-year overall survival rates according to stages were 100% in stage I, 90.5% in stage II, and 88.6% in stage III. Conclusion: Laparoscopic complete mesocolic excision in right colon cancer treatment is technically feasible, safe and with acceptable complication rate.

** Keywords: Right colonic cancer; Complete mesocolic excision; Laparoscopy; Oncologic outcome.*

INTRODUCTION

At the end of the 19th century, Emil Theodor Kocher was the first to theorize oncologic resections based on removal of the involved organ along with its lymphatic drainage; this concept was shortly after substantiated by Miles et al and Jemison et al for rectal and colonic cancer respectively in 1909. Over seventy years later, the real revolution in oncologic surgery was performed by Heald et al, who introduced the concept of total excision

of the mesorectum (TME), this one promptly became a central part of any multimodal treatment of rectal cancer.

In 2009, Hohenberger [1] et al translated the concept of TME to colonic cancer, noting that traditionally more favorable oncologic results of colon neoplasia was eventually overtaken by rectal cancer: Multimodal strategies, not yet applied to colonic tumors, and a more radical surgical approach performed along embryonic planes of development with higher quality specimens, produce better oncologic outcome;

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Date received: 20/10/2018

Date accepted: 02/12/2018

thus, complete mesocolic excision (CME) with central vascular ligation (CVL) was theorized, standardized and eventually validated by several studies [2, 3, 4]. CME allows for an extensive lymph node dissection along the feeding vessels, with significant effect on regional recurrence and systemic dissemination, as shown by improved survival in stage I - III colonic cancers treated with enhanced lymph node harvesting [5, 6, 7, 8, 9].

The aim of this study is: *To report early results of 74 right colon cancer patients underwent laparoscopic CME.*

SUBJECTS AND METHODS

1. Subjects.

Seventy-four patients with right colonic cancer underwent laparoscopic CME from April 2015 to June 2018. All patients were preoperatively investigated with colonoscopy, diagnosed with biopsy, and staged by contrast-enhanced thoracic and abdominal computed tomography (CT) scan along with carcinoembryonic antigen (CEA) blood levels; postoperative oncologic follow-up was based on biannual clinical evaluation with CEA testing and yearly thoraco-abdominal CT scan.

2. Methods.

** Operative technique:*

The patient is placed in reversed Trendelenburg position with 30° left tilt, the pneumoperitoneum is induced by open technique with placement of three additional trocars semi-circumferentially around the umbilicus, the abdominal cavity is explored. Once the "working space"

is created, no-touch medial to lateral technique is always adopted: the ileocolic vessels are stretched so as to delineate the Treves' arcade, and peritoneal incision is commenced at the base of the created peritoneal fold; dissection of the anterior peritoneal sheet is performed along the left margin of the superior mesenteric artery (SMA) with transection of the ileocolic and the inconstant right colic vessels at their roots, and "en bloc" lymphadenectomy of the anterior aspect of the superior mesenteric vein (SMV) from the ileocolic vessels to the gastrocolic trunk of Henle is performed; at this point, the anatomoembryological plane along the Toldt's fascia is sharply developed from medial to lateral and from bottom to top, without mobilizing the duodenum, as suggested by Hohenberger et al [1], but dissecting along the plane between the intact dorsal mesocolon of the hepatic flexure and the preduodenopancreatic fascia.

In case of cecum or ascending colon cancer, the stretched transverse mesocolon is progressively transected with central ligation of the right branch of the middle colic vessels, and the colon is stapled 10 cm off the tumor (right hemicolectomy); for hepatic flexure or proximal colon transversum cancers, middle colic and right gastroepiploic vessels are ligated at their roots, subpyloric lymph nodes are removed, 10 - 15 cm of greater omentectomy off the tumor is performed, and colon stapling is carried out just proximal to the splenic flexure (extended right hemicolectomy).

Hepatic flexure is mobilized by severing the lateral peritoneal fold. The cecal ligaments and the lateral attachment are progressively severed to obtain complete mobilization of the specimen; the ileum is stapled at 10 - 15 cm from the ileocecal valve, and the specimen is extracted through a protected mini-incision at the umbilicus. Side-to-side mechanical intracorporeal anastomosis is accomplished by the placing two sides of the linear cutter stapler.

RESULTS

1. Patient characteristics.

Table 1:

Parameters	Value
Age (year)	61.4 ± 12.2
BMI (kg/m ²)	21.2 ± 4.1
Tumor location:	
Cecum	11 (14.9%)
Ascending colon	15 (20.3%)
Hepatic flexure	34 (45.9%)
Transverse colon	14 (18.9%)
Operation:	
Right hemicolectomy	52 (70.3%)
Extended	22 (29.7%)

The mean age of patients (49 males and 25 females with male to female ratio of 1.9) was 61.4 ± 12.2 years. Twenty two patients (29.7%) underwent an extended right hemicolectomy (hepatic flexure in 8 patients, transverse colon in 14 patients).

2. Perioperative clinical results.

The mean operation time was 105.7 ± 30.5 mins (range 50 to 230 mins). The mean intraoperative bleeding was 28.2 ± 34.3 mL. The mean number of days to 1st gas passing was 3.3 ± 0.7 days (range 2 to 5 days). The mean number of days to soft diet was 4.0 ± 1.5 days (range 3 to 6 days). The mean hospital stay was 8.7 ± 2.0 days (range 5 to 15 days). The conversion rate was 2.8%. The reasons for conversion were severe adhesion in two patients.

Postoperative complications occurred in 7 patients (9.7%). There was one case of mortality within 30 days (due to myocardial infarction). A late complication was defined as a complication occurring 30 days after the surgery. A late complication was obstruction and occurred in 1 patients (1.4%).

Table 2: Postoperative clinical outcomes.

Parameters	Value
Wound infection	3 (4.1%)
Pneumonia	0
Urinary infection	1 (1.4%)
Anastomotic leakage	1 (1.4%)
Anastomotic bleeding	0
30-day mortality	1 (1.4%)
Intestinal obstruction	1 (1.4%)
Total number of complications	7 (9.7%)

3. Pathologic results.

For mesocolic plane of surgery, mean ileocolic segment length was 29.5 ± 3.8 cm and resection margins were all free of microscopic disease; median size of

tumor was 4.8 ± 1.8 cm, distance from the nearest bowel wall to high tie was 76 ± 5 mm, distance from tumor to high tie was 92 ± 5 mm; mean lymph nodes harvested were 19.7 ± 7.1 .

The distribution of the TNM stage was stage I in 18 patients (24.3%), stage II in 34 patients (46.0%), and stage III in 22 patients (29.7%). Histologic grade of differentiation was good in 9 patients (12.2%), moderate differentiation in 49 patients (66.2%), poor: 4 patients (5.4%) and mucinous in 12 patients (16.2%).

4. Oncologic outcomes.

The mean follow-up period was 41.9 ± 14.2 months (range 1 to 60 months). The 3-year overall survival rate was 91.9% in all stages, 100% in stage I, 90.5% in stage II and 88.6% in stage III. All recurrences were systemic recurrences and occurred in the liver (4 patients = 5.4%), the lung (4 patients = 5.4%). There wasn't case of port site recurrence.

DISCUSSION

The concept of CME is based on sharp division of the primitive mesocolon, deriving from splanchnopleuric layer of lateral mesoderm and the primitive parietal peritoneum, from somatopleural layer of mesoderm, developing the avascular plane between the mesofascial and the retrofascial interface [10] along the plane of Toldt (the same concept of the Holy plane introduced by Heald et al for TME): this latter is not thus simply confined to the lateral peritoneal attachment

(white line of Toldt), but occurs as a result of condensation of mesofascial interface fibers, all along the mesocolon course, up to its mesenteric insertion.

The no-touch resection of all the envelope of the primitive dorsal mesentery along the anatomic-embryological avascular cleavage planes is therefore fundamental for a true optimal R0 resection, as the meso contains all potential routes of initial metastatic spread through lymphovascular, neuroperineural and fibrofatty tissues.

In addition to CME, radical lymphadenectomy, comprising apical lymph nodes, proper of central vascular ligation, is of paramount importance in obtaining adequate regional control and impact on survival: the latest 2014 Japanese Society for Cancer of the Colon and Rectum [11] (JSCCR) guidelines recommend D2 dissection for clinically early stages of colorectal cancers and D3 dissection for more advanced disease, reaching impressive results in terms of local recurrence and patient's survival in JCOG0404 trials [12].

The CLASICC trial reported a 3-year overall survival rate of 74.6% and a 3-year disease-free survival rate of 70.9% for the laparoscopic anterior resection group, and those results were not significantly different from the results for the open anterior resection group [13]. In the COST trial, the 3-year overall survival was about 85% in all stages, about 90% in stage I, about 85% in stage II, and about 80% in stage III for the laparoscopic

colectomy group. These survival results were similar to those for the open colectomy group. In the present study, the 3-year overall survival rate was 91.9%, and the other results were comparable with both the survival results of the CLASICC and the COST trials.

The mean operation time of 105.7 ± 30.5 minutes in the present study was comparable to previously reported operative times, which ranged from 107 to 208 minutes. The mean number of days to 1st gas passing of 3.3 ± 0.7 days, and the mean number of days to soft diet of 4.0 ± 1.5 days in the present study were comparable to previously reported values for the mean number of days to 1st gas passing (2 to 5 days) and the mean number of days to a soft diet (2 to 5 days). The overall complication rate was 9.7% in the present study less the recent studies¹.

In the COST, colon cancer laparoscopic or open resection (COLOR) and CLASICC trials [13], the conversion rates ranged from 17% to 29%. In the present study, the conversion rate was 2.8%, and the reasons of conversion were adhesion. A re-operation was performed in 1 case due to postoperative obstruction.

CONCLUSION

The short-term clinical outcomes of the present study showed the feasibility of a laparoscopic CME for the treatment of colon cancer. Moreover, the long-term oncologic results were acceptable.

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