

Comparison of Initial Outcome between Hand-Assisted Laparoscopic Surgery and Laparoscopic Assisted Surgery for Colorectal Cancer at Maharaj Nakorn Chiang Mai Hospital

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Abstract

Objective: This study aimed to compare the initial outcome between hand-assisted laparoscopic surgery and laparoscopic assisted surgery in patients with colorectal cancer at Maharaj Nakorn Chiang Mai Hospital, Chiangmai,Thailand.

Patients and Methods: Between June 2007 and January 2008, 10 patients underwent laparoscopic colorectal cancer surgery at our hospital. The information including history, clinical presentation, laboratory tests, radiological reports, operative findings, postoperative complications and length of hospital stay were recorded.

Results: There were 5 patients in hand-assisted laparoscopic surgery group and another 5 patients in laparoscopic assisted surgery group. There were no significant difference between two groups in terms of operative time, total blood loss, post-operative pain score and length of hospital stay. There was no conversion to open surgery and no postoperative mortality. One postoperative complication with pneumonia occurred in laparoscopic assisted surgery group.

Conclusions: Our initial experience showed that laparoscopic surgery for colorectal cancer was safe. There was no difference in term of initial outcomes between hand-assisted laparoscopic colectomy and laparoscopic assisted colectomy. However, more cases are needed before any solid conclusion can be drawn.

Keywords: colorectal carcinoma, laparoscopic, hand-assisted

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INTRODUCTION

Colorectal cancer is a common health problem in Western and Asian countries¹ in which surgery is the major primary treatment in most patients.² Conventional laparotomy has some disadvantages associated with significant morbidity and long-term recovery.^{3,4} Jacob et al.⁵ was the first group who reported the technical feasibility of laparoscopic colectomy in 1991. After that this technique has been applied to benign colorectal conditions such as diverticulitis,⁶⁻⁸ polyps,⁹ inflammatory bowel disease,^{10,11} and rectal prolapse^{12,13}, and colorectal cancer recently.^{14,15} Nowadays laparoscopic colorectal cancer surgery has become widely used.^{14,15} Several reviews showed the advantages of laparoscopic surgery over open surgery in many ways such as reduced post-operative pain, shorter hospital stay, faster recovery and good cosmetic result.¹⁶⁻²⁰ Therefore, laparoscopic colon resection is an acceptable, non inferiorly and perhaps preferable alternative to open resection for colorectal cancer. In certain circumstances, however, it is difficult to perform due to the lack of tactile feedback, difficulty in mobilizing the large tumor, and difficulty in controlling and ligating multiple vascular pedicles.²¹ Hand-assisted laparoscopic colectomy (HALC) is a hybrid technique that applies a special hand access device that maintains pneumoperitoneum. Surgeons can use their hands through the device for increasing visualization, retraction, dissection, and also controlling pedicle vessels. Recent studies showed the benefits of HALC in advanced colorectal procedures including difficulty cases and previous operative cases.^{22,23} However, it is still uncertain whether there is any difference in outcome between laparoscopic assisted colectomy (LAC) and HALC. Therefore we reviewed our initial experience from June 2007 to January 2008 to compare the outcome between these two techniques in patients with colorectal cancers.

MATERIALS AND METHODS

Between June 2007 and January 2008, 10 patients underwent laparoscopic colorectal cancer surgery at the Department of Surgery, Chiangmai Hospital. The information including pre-, intra-, and postoperative data were reviewed. Preoperative data included history of patient, clinical presentation, laboratory tests and x-ray reports. Intraoperative parameters included

operative finding, operative time, blood lost and operative complications. Postoperative data included post-operative pain score, post-operative complications, length of hospital stay and pathologic results including pathologic staging, tumor size, number of lymph nodes dissection. Among these cases, we assessed the benefits and short-term outcomes. This project was approved by the ethics committee of Chiang Mai University (Ethics number 08MARO61625).

Preoperative care

All patients received oral mechanical bowel preparation with sodium phosphate one day prior to surgery and received soap saline enema in the morning of surgery. In cases with locally advanced rectal cancers, neo-adjuvant chemoradiotherapy was given to reduce the size of tumor.

Technique of surgery

Carbondioxide was inflated to create pneumoperitoneum for maintaining intra-abdominal pressure 12-15 mmHg. Medial to lateral mobilization was performed for both right and left site colonic lesions. Vascular ligation was done using endoclips and ligasure [vessel sealing system]. Specimens were removed through lap-disc in case with HALC (Figure 1) and specimens were removed through small midline suprapubic incision in case with LAC (Figure 2). Extracorporeal anastomosis was done with linear stapler in right hemicolectomy and sigmoidectomy. In left site colonic lesion, anastomosis was done by using circular stapler.



Figure 1 Hand-assisted laparoscopic colectomy specimen was extracted through lap-disc.

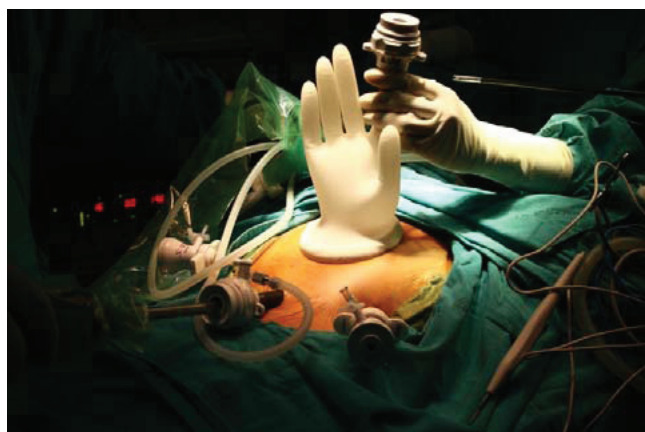


Figure 2 Laparoscopic assisted colectomy. Glove technique was applied as one surgical port and also used as the root of specimen extraction.

Postoperative care

Oral fluid intake was allowed after any sign of recovered bowel function. Nasogastric tubes and urinary catheters were removed in 24-48 hours (except in abdominoperineal resection case where urinary catheters were removed in 5 days). Patients were discharged when surgeons felt satisfied with patients' recovery.

Demographic data were analyzed using descriptive statistics. Continuous variables were compared between groups using the Mann Whitney U-test for non parametric data. Independent data were analyzed using Fisher's Exact test. A $P < 0.05$ was considered statistically significant.

RESULT

We reported the outcome of patients ($n = 10$) with colorectal cancer who were treated by laparoscopic surgery. Five patients were operated by hand-assisted laparoscopic surgery (right half colectomy [$n = 2$], sigmoidectomy [$n = 2$], abdominoperineal resection [$n = 1$]), and the others were operated by laparoscopic assisted surgery (sigmoidectomy [$n = 2$], low anterior resection [$n = 2$], abdominoperineal resection [$n = 2$]).

Demographic data of both groups were compared. There were no significant differences between the groups in terms of age, sex distribution, disease pattern, operative procedure or comorbidity (Table 1).

The operative time was not significantly different

Table 1 Demographic and operative data

Variable	HALC (n = 5)	LAC (n = 5)
Age (yr)		
40-60	3 (60%)	2 (40%)
> 60	2 (40%)	3 (60%)
Sex		
Male	2 (40%)	3 (60%)
Female	3 (60%)	2 (40%)
Primary site of tumor		
Caecum	1 (20%)	-
Ascending colon	1 (20%)	-
Sigmoid colon	2 (40%)	2 (40%)
Rectum	1 (20%)	3 (60%)
Operative Procedure		
Right hemicolectomy	2 (40%)	-
Sigmoidectomy	2 (40%)	2 (40%)
Low anterior resection	-	2 (40%)
APR	1 (20%)	1 (20%)
Comorbidity		
None	3 (60%)	3 (60%)
Hypertension	2 (40%)	2 (40%)
Receive Preoperative chemoradiation		
Yes	1 (20%)	-
No	4 (80%)	5 (100%)

HALC, hand-assisted laparoscopic colectomy; LAC, Laparoscopic assisted colectomy

Table 2 Operative parameters

Variable	HALC (n = 5)	LAC (n = 5)	P Value
Operative time (min)	179 ± 32.46	195 ± 24.52	0.52
Estimated blood loss (ml)	118 ± 18.21	180 ± 27.29	0.136

HALC, hand-assisted laparoscopic colectomy; LAC, Laparoscopic assisted colectomy

between HALC group and LAC group (Table 2). The estimated blood loss was lower in HALC group than in the LAC group, but this trend was not statistically different (Table 2).

In the postoperative period, patients in the HALC group appeared to have earlier resumption of oral intake, faster recovery of gastrointestinal functions, less need for analgesic drug, and overall shorter hospital stay compared with the LAC group. There was no significant difference in pain score between the two groups (Table 3). One patient in LAC group had post operative lung complication (pneumonia) which were completely treated in two weeks.

About pathologic parameters, there were no

Table 3 Postoperative parameters

Variable	HALC (n = 5)	LAC (n = 5)	P Value
Time to oral intake (day)	2.2 ± 0.45	2.6 ± 0.78	0.72
Time to passage of flatus (day)	1.9 ± 0.38	2.0 ± 0.24	0.69
Time to passage of stools (day)	2.0 ± 0.54	2.1 ± 0.32	0.74
Use of analgesia (day)	2.6 ± 0.45	3.3 ± 0.67	0.68
Post operative pain score	2.0 ± 0.56	2.0 ± 0.48	0.65
Length of hospital stay (day)	6.6 ± 1.78	8.4 ± 2.45	0.67

HALC, hand-assisted laproscopic colectomy; LAC, Laparoscopic assisted colectomy

Table 4 Pathologic parameters

Variable	HALC (n = 5)	LAC (n = 5)	P Value
Pathologic staging			
Stage II	2 (40%)	4 (80%)	0.32
Stage III	3 (60%)	1 (20%)	
Tumor volume (cm ³)	62.2 ± 8.82	26.2 ± 4.35	0.45
Number of Lymph node dissection	11.8 ± 3.12	7.6 ± 1.64	0.34

HALC, hand-assisted laproscopic colectomy; LAC, Laparoscopic assisted colectomy

significant differences in pathologic staging and tumor volume between the groups. The number of lymph nodes dissection was not significantly higher in the HALC group than in LAC group (Table 4).

DISCUSSION

In the present study, patients in HALC seemed to have better outcome than those under LAC group including early recovery of gastrointestinal functions, less postoperative pain and less use of analgesic drugs and shorter time of hospital stay. In HALC group the tumor volume was larger than LAC group. This might reflect our practice which uses HALC in cases with large tumors, as several studies had suggested to perform HALC in cases with large size of tumor.²⁴

The advantage of HALC is surgeons have direct tactile feedback and consequently improved hand-eye coordination with increased surgical accuracy. The benefits of tactile feeling are shortened dissection maneuver, avoid unnecessary movements, smooth traction, increase exposure and facilitate the control of unexpected or difficult situations.²⁵ However, surgeons should select case by case to perform LAC or

HALC. From our initial experience, we prefer HALC in advanced colorectal procedures including patient who has large tumor volume cancer in lower part of rectum or previous operation.

Although we believe our result is valid, we need more cases to gain our experience and increase learning curve in the future. Recent publications have suggested the learning curve of laparoscopic colectomy. It needs more than 20-25 cases and in prospective randomized study of colorectal cancer in UK, the "CLASSICC" trial, surgeons had to perform at least 20 laparoscopic resections before they were qualified to be investigators in study.²⁶ The COLOR trial from Europe suggested that the learning curve was clearly greater than 20 cases and surgeons needed to perform a minimum yearly number of procedures to maintain their skills.²⁷

CONCLUSION

Our initial experience showed that laparoscopic surgery for colorectal cancer was safe at our hospital. There were no differences in term of initial outcomes between hand-assisted laparoscopic colectomy and laparoscopic assisted colectomy. However, we need more cases to study before we can make the strong final conclusion.

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