

EVALUATION THE RESULTS OF LAPAROSCOPIC SURGERY FOR RECTAL CANCER

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ABSTRACT

Objective: Studying indications and reviewing results of laparoscopic surgery in rectal cancer treatment. **Patients and Methods:** 146 patients hospitalized at Hue Central Hospital from April 2007 to March 2013 were diagnosed rectal cancer and performed colectomy removal with tumors by peritoneal laparoscopic surgery.

Results: The rate of sphincter preservation got 56.8% for all methods. The median operative duration of laparoscopic surgery for rectal cancer patients was 202 minutes, the longest time was in pull-through operation. The rate of open surgery transfer was 10.3%, majority was patients at T4 stage. The highest rate of open surgery transfer was seen in middle rectal cancer patients. No death in operation and post-operation. The rate of complication was 8.9%. The rate of anastomotic leakage was 1.4%. The median time of staying at hospital after surgery was 8.3 days. Local-regional recurrence rate was 8.2% and the median time to recurrence was 18.8 ± 13.7 months for all operative methods. The rate of recurrence in AR, Miles and pull-through operation was 7.8%, 6.4% and 12.5%, respectively. 5-year overall and disease-free survival rate were 84.25% and 80.1%, respectively. Estimated median survival time was 67.8 ± 2.1 months. Survival time in pull-through patients was 36 ± 21.54 months, longer than the two remaining groups. Sphincter self-control function on 32 patients underwent sphincter preservation pull-through: Kiwan I, II: 78.1%, Kiwan III: 21.9%, no patients at level IV and V. **Conclusion:** Laparoscopic surgery for rectal cancer is a feasible and safe procedure with perioperative complications are acceptable.

I. BACKGROUND

Colorectal cancer is one of the ten most common cancers in developed countries, is the second largest cause of death after lung cancer. In Vietnam, colorectal cancer ranks fifth after lung cancer, stomach cancer, liver cancer and breast cancer in women. Primary treatment is surgery and the possibility of radical surgery is high.

During this period of time, open operation has been classic in rectal cancer surgery. But from the

early 1990s with the explosion of laparoscopic surgery, laparoscopic surgery in rectal cancer treatment began to be widely applied in surgical centers all over the world, with the advantages have been proven to cause as little damage to the belly less pain after surgery, to reduce the rate of infection, abdominal hernia reduction, shortening the time of hospitalization, faster recuperation, and aesthetics. In particular, the method of laparoscopic surgery allows to access to the pelvis easier than with open surgery in

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rectal cancer patients so it is more widely applied.

In Vietnam, laparoscopic surgery for colorectal cancer has been applied since the year of 2000 at some major hospitals in Hanoi, Ho Chi Minh City and Hue, which gives very satisfactory results.

During the earlier period, the in-country research focused on applying, evaluating the feasibility of laparoscopic surgery regarding to technical implementation in the treatment of rectal cancer. Although there have been many reports of laparoscopic surgery in the treatment of rectal cancer in vary sites and stages of the disease, but due to the specific conditions of the equipments, the time of laparoscopic surgery practice is different at many surgical facility so there are still many points of view not consistent, especially in the indication.

II. METHODS

2.1. Patients

Including 146 patients hospitalized at Hue Central Hospital from April 2007 to March 2013 were diagnosed rectal cancer and performed colectomy removal with tumors by peritoneal laparoscopic surgery.

Enrolling criteria

- Primary rectal cancer patients.
- Having indication of laparoscopic surgery
- Any T
- Stage IV or T4 patients were performed

preoperative chemoradiation

Exclusion criteria

- Recurrent rectal cancer.
- Patients have history of lower abdomen surgery because of gynaecological cancers.

A descriptive, non-comparison, prospective intervention study.

2.2. Method

2.2.1. Indications of laparoscopic surgery methods

- Anterior Resection (AR): indication for higher

rectal cancer, distance from tumor edge to anal margin is more than 10 cm.

- Low Anterior Resection (LAR): indication for middle rectal cancer, distance ranges from 6 to 10 cm, T1 tumors, stage II (T3, no pararectum lympho node), stage III (1, T2, T3 positive lympho nodes).

- Lap.Sphincter Saving Rectal Resection (Pull-through procedure): indication for lower rectal cancer, distance ranges from 5 to 6 cm, stage T1-3, and there is no evidence of sphincter invasion.

- Miles operation: indication for lower rectal cancer (under 5 cm or 5-6 cm distance to anal margin and sphincter invasion tumors).

2.2.2. Data collection and processing: Using the software SPSS 19.0.

III. RESULTS

3.1. Patients' characteristics

Age

Median age is 59. Oldest is 89 and youngest is 14.

Most seen age range is at 41- 80.

Gender

Gender distribution is similar among male and female.

Body Mass Index

69.2% of patients had normal BMI, only 6 patients (4.1%) is over weight. No obese patient.

Performance Status

- 55 rectal cancer patients hospitalized with weight loss.

- 33 rectal cancer patients hospitalized with anemia.

- 76.7% of patients had good performance status (ASA1), 13.0% of patients had ASA2, 10.3% at bad performance status. No patients had in severe status, threats to life and death threats in 24 hours (ASA4, ASA5).

3.2. Pathology and staging

- Adenocarcinoma was most common, accounting for 96.6%. Squamous cell carcinoma accounted for 0.7%.

- 91.1% of patients had well and moderated differentiation.

- 5.6% of patients had T4 tumor, 123 patients (84.3%) had N1 và N2

4.1% of patients had distant metastasis

- UICC staging: No patient at stage I, 84.3% of patients were at stage III

Rate of stage III-IV/ I-II was 7.6:1

3.3. Indication laparoscopic surgery methods

Table 1. Indication laparoscopic surgery methods

Surgical method	n	%
AR and LAR	51	34.9
Pull-through operation	32	21.9
Miles operation	63	43.2
Total	146	100

3.4. Intraoperation outcome

Table 2. Operative duration

Operation	n	Duration (minutes)		
		Median	Shortest	Longest
AR and LAR	51	187	90	380
Pull- through	32	222	105	410
Miles	63	205	60	105
Total	146	202	60	410

Table 3. Intraoperative accidents

Intraoperative accidents	n	%
No accident	142	97.3
Bleeding	1	0.7
Adjacent organ injury	3	2.1
Total	146	100

Table 4. Operating methods

	Operating methods			n
	AR/LAR	Pull-through	Miles	
No events	50	32	60	142
Bleeding	0	0	1	1
Urethra injury	1	0	1	2
Bladder injury	0	0	1	1
Total	51	32	63	146

Table 5. Transferring to open surgery

	Reasons		
	Bleeding	Organ injury	Adjacent invasion (T4)
N	1	3	11
% (n=146)	0.7	2.1	7.5

14/15 patients transferred to open surgery were at stage III, accounting for 11.4%.

The rate of open surgery transfer was most seen in the patient group with middle rectal tumors, accounting for 16.9%; group with low rectal tumors, accounting for 7.9% ($p < 0.1$).

3.5. Early results

Early death: No early death at the postoperative time.

Table 6. Postoperative complications

	n	%
Peritonium bleesing	2	1.4
Incision infection	3	2.1
Partial bowel obstruction	5	3.3
Anastomotic leakage	2	1.4
Urethra fistula	1	0.7
Total	13	8.9

The time to take IV pain killer after surgery

Almost patients took pain killers within 5 days after surgery (68.5%), a number of patients who took pain relief drug more than 5 days just accounted for 31.5%.

The time to re-establish gastrointestinal circulation

The time to re-establish gastrointestinal circulation within 3 days after surgery accounted the high rate of 62.3%.

The time of staying at hospital after surgery

The shortest was for 3 days, longest was 32 days, the median time was 8.3 days.

3.6. Late results

Table 7. Locoregional recurrence

Time Recurrence	12 months	24 months	36 months	48 months
n	7	8	11	12
%	4.8	5.5	7.5	8.2

Recurrence rate: 12 patients were diagnosed recurrence on follow-up, accounting for 8.2%. Median follow-up time: 42.2 ± 10.4 months (6- 72 months). Median recurrence time: 18.8 ± 13.7 months for all operating methods.

Table 8. Relation between operating methods and recurrence

Operating method	n	Median time to recurrence (month)	SD	p
LAR (n= 51)	4	13.60	13.06	<0,05
Pull-through (n=32)	4	27.54	18.43	
Miles (n=63)	4	15.54	4.68	
Total	12	18.79	13.69	

The rates of locoregional recurrence in 3 patient groups of LAR, Pull-through and Miles operation were 7.8%, 12.5% and 6.4%, respectively.

Table 9. Overall survival time

Method	n	Median Survival time (months)	SD	p
AR and LAR	51	20.98	16.54	<0,001
Pull-through	32	36.00	21.54	
Miles	63	29.96	19.65	
Total	146	29.96	19.65	

Median survival time: 29.96 ± 19.65 months. 11 patients died on follow-up time, accounting for 7.5%. 5-year overall survival rate got 84.2%.

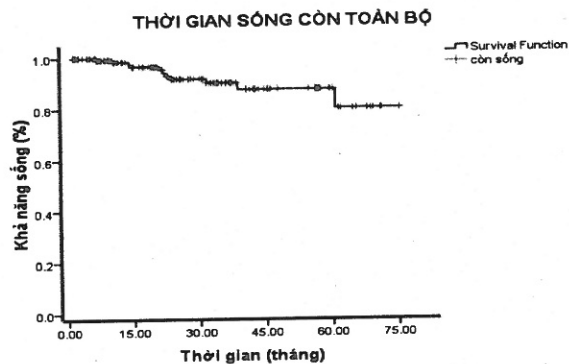


Figure 1a. Disease-free survival time

12 patients were diagnosed recurrence on follow-up, accounting for 8.2%.

6 patients were diagnosed distant metastasis on follow-up, accounting for 4.1%.

5-year disease-free survival rate was 80.1%.

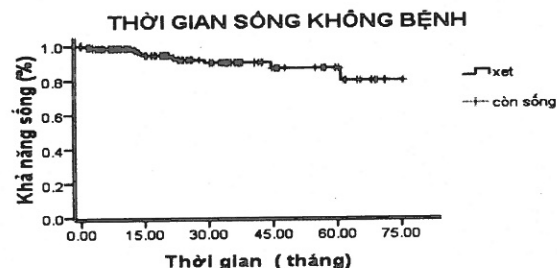


Figure 1b. Disease-free survival time

Table 10. Quality of life after surgery

Kiwan criteria	n	%
I	15	46.9
II	10	31.2
III	7	21.9
Total	32	100

IV. DISCUSSION

4.1. Events and complications

There were four cases of inoperative recurrence, accounting for 2.8%, including 3/4 of events were adjacent organ injury. Especially all these adjacent organ injury occurred in Miles operation. To explain this, we believe that patients underwent Miles operation got T4 tumors and large invasion, the risk of adjacent organ injury was higher [2].

Transferring open surgery was also an important factor need to consider in laparoscopic surgery generally and rectal cancer laparoscopic surgery particularly. Our fifteen patients were transferred open surgery, accounting 10.3%, similar to other authors in rectal cancer radical surgery. Particularly in Miles operation, the rate of open surgery transfer ranges 0-25% in other studies [3]. According Adrien Indar et al., the rate of open surgery transfer ranged from 3% to 29% for all methods, because of large invasive or multi-foci disease (41%), obese patient (26%), anatomical abnormal (21%), unremarkable tumour (20%). The open surgery transfer didn't impact to the final surgery outcome [1],[5].

Anastomotic leakage was the major cause of death and morbidity after colorectal cancer surgery [4]. There were two cases of anastomotic leakage (1.4%), including one complete anastomotic leakage whom was operated again to do sigmoid artificial anus, one fistula to vagina whom was operated to close fistula and do sigmoid artificial anus as well [6]. All patients were belong to group underwent pull-through methods.

Through above results and analysing, we remark that some factors can impact to the techniques (which causes open surgery transfer, inoperative events, operative duration): Tumor location, tumor invasion, skill of surgeon, equipments, patients' performance status [7].

4.2. Operative duration and the time of staying at hospital after surgery

The median operative duration in this study was 202 minutes (60 to 410 minutes), higher than one in the study of Mario M. et al. (250 minutes); the median time of staying at hospital after surgery was 12.05 days [7][8], but lower than one in the study of Zhou Z-G (120 minutes) and và the median time of staying at hospital after surgery was 8 days [9]. Patients underwent pull-through method had the longest operative duration and AR method had the shortest operative duration.

4.3. Loco-regional recurrence

On follow-up of 146 patients, there were 12 locoregional recurrence cases (8.2%). Risk factors were tumor invasion, differentiation...

The median time of recurrence was 18.8 ± 13.7 months for all methods. According to Kapiteijn, local recurrence was 14-16% for the first two years. Multi-center studies also remarked that recurrence majorly occurred in three years after surgery [7]. Our remark was that, there were some risk factors as follow: tumor stage, inoperative tumor breaking, cell differentiation. According to Fernandez-Represa JA, the surgical technique was also the factor which impacts on recurrence rate.

Comparing operation methods to each other, we remarked that the highest recurrence rate can be seen in group of pull-through patients, 12.5%. However, the median time to recurrence in this group was longer than the remaining groups.

4.4. Overall survival

With the median follow-up of 42.2 ± 10.4 months, there were 11 deaths, accounting for 7.5%. The median survival time was 29.96 months. For the relation between survival time and surgical methods, we remarked that the median survival time was highest in the group of pull-through patients, 36 months. Kaplan-Meier- based estimated median survival time for all patients was 67.8 months, 5-year overall survival rate got 84.2%. Deaths mainly occurred in the three years after surgery, because of recurrence and metastasis. Summarizing from multi-center studies, Adrien Indar et al. recorded that 5-year survival rate was 81% in Staudache's study, 81.4% in Blanchi et al's study; 5-year survival rate was lower in Leroy et al.' study (just got 75%) [1].

4.5. Disease-free survival

5-year disease-free survival in this study was 80.1% which was similar to the result of Blanchi et al. (79.8%) but higher the result of Staudacher et al. (70%). In 146 patients, there were six patients with distant metastasis at the diagnosing time (5 live mets and 1 lung met). On the base of

treatment guidelines, we performed neoadjuvant chemotherapy of FOLFOX₄ regime for these patients and then did operation 5 weeks after that. Two among six patients had been progressive and death while the remaining four patients were still alive with progression-free disease. This result demonstrated the role of neoadjuvant chemotherapy for metastatic rectal cancer, contributing on improving 5-year disease-free survival, showed in this study.

4.6. Quality of life after surgery

Using Kiwan score of sphincter self-control function assessment on patients underwent sphincter preservation pull-through showed that: there are 25/32 patients (78.1%) had the well result of anal function (level I and II), seven patients at level III (21.9 percent), no patients at level IV and V.

V. CONCLUSION

Through the study of 146 rectal cancer patients whom were diagnosed and radical treatment by laparoscopic surgery at Hue Central Hospital from April 2007 to March 2013, we got some conclusion as follow:

- Indication:

Indicating for 146 patients:

Rectum resection: 51 patients, accounting for 34.9%.

Sphincter reservation colorectal removal, colon-anus connection (Pull-through operation): 32 patients, accounting for 21.9%.

Anus- rectum removal via abdomen- perineum

(Miles operation): 63 patients, accounting for 43.2%.

The rate of sphincter preservation got 56.8% for all methods.

- Technical features:

The median operative duration of laparoscopies surgery for rectal cancer patients was 202 minutes, the longest time was in pull-through operation.

The rate of open surgery transfer was 10.3%, majority was patients at T4 stage. The highest rate of open surgery transfer was seen in middle rectal cancer patients.

Laparoscopic surgery outcome for rectal cancer:

No death in operation and post-operation. The rate of complication was 8.9%. The rate of anastomotic leakage was 1.4%. The median time of staying at hospital after surgery was 8.3 days.

Loco- regional recurrence rate was 8.2% and the median time to recurrence was 18.8 ± 13.7 months for all operative methods. The rate of recurrence in AR, Miles and pull-through operation was 7.8%, 6.4% and 12.5%, respectively.

5-year overall and disease-free survival rate were 84.25% and 80.1%, respectively.

Estimated median survival time was 67.8 ± 2.1 months.

Survival time in pull-through patients was 36 ± 21.54 months, longer than the two remaining groups.

Sphincter self-control function on 32 patients underwent sphincter preservation pull-through: Kiwan I, II: 78.1%, Kiwan III: 21.9%, no patients at level IV and V.

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