



ORIGINAL ARTICLE

Laparoscopic Rectal Cancer Surgery : Early Experience at Lampang Hospital

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Abstract

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Background: Laparoscopic rectal cancer surgery is a form of minimally invasive surgery that has evolved over time. Laparoscopic rectal cancer surgery involves several challenges, including an even longer learning curve when compared to laparoscopic colon cancer surgery.

Objective: To demonstrate the short-term results of laparoscopic rectal cancer surgery and share early experiences with this technique.

Material and methods: Nine patients with rectal cancer underwent laparoscopic rectal cancer surgery between July 2022 and February 2023 by a single surgeon at Lampang Hospital. All patients underwent preoperative computerized tomography of the chest and abdomen, and pelvic magnetic resonance imaging. Four patients with lower rectal lesions received neoadjuvant concurrent chemoradiotherapy (CCRT) before surgery, which was performed within 8–12 weeks after the last date of CCRT.

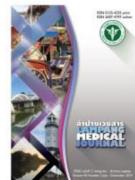
Results: The patients included six women and three men, with a mean age of 61.0 (SD 9.1) years (range, 44–70). Among them, four had lesions located in the rectosigmoid junction, one in the middle rectum, and four in the lower rectum. The operative time ranged from 210 to 480 minutes (mean 340, SD 95), and the intraoperative blood loss ranged from 50 to 500 mL (mean 161, SD 143). The length of stay ranged from 6 to 8 days (mean 7.1, SD 0.7). There were no perioperative or postoperative complications. Pathological reports indicated adequate inclusion of the distal rectal margin, circumferential resection margin, and lymph nodes.

Conclusion: Laparoscopic rectal cancer surgery utilizing the medial approach technique provides numerous short-term benefits. The inclusion of a supervisory surgeon or a structured training program can aid in achieving a steeper learning curve in this technique.



ลำปางเวชสาร

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นิพนธ์ต้นฉบับ

การผ่าตัดมะเร็งลำไส้ตรงผ่านการส่องกล้องผ่าตัดช่องท้อง :

ประสบการณ์ระยะแรกในโรงพยาบาลลำปาง

พุทธิพงศ์ หริโณวรรณ พ.บ.

กลุ่มงานศัลยกรรม โรงพยาบาลลำปาง

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ค่าสำคัญ:

มะเร็งลำไส้ตรง, การผ่าตัดผ่านการส่องกล้องผ่าตัดช่องท้อง

ภูมิหลัง : การผ่าตัดมะเร็งลำไส้ตรงผ่านการส่องกล้องผ่าตัดช่องท้องเป็นส่วนหนึ่งของการผ่าตัดแบบแผลเล็ก การผ่าตัดมีความท้าทายในหลายด้าน ต้องใช้เวลาในการฝึกฝนที่นานกว่าการผ่าตัดลำไส้ใหญ่ผ่านการส่องกล้องผ่าตัดช่องท้อง

วัตถุประสงค์ : เพื่อนำเสนอผลการผ่าตัดในระยะสั้นและประสบการณ์ในระยะแรกของการผ่าตัดมะเร็งลำไส้ตรงผ่านการส่องกล้องผ่าตัดช่องท้อง

วัสดุและวิธีการ : มีผู้ป่วย 9 รายได้รับการผ่าตัดมะเร็งลำไส้ตรงผ่านการส่องกล้องผ่าตัดช่องท้อง ในรพ.ลำปาง ช่วงเดือน ก.ค. 2565 – ก.พ. 2566 โดยศัลยแพทย์ 1 คน ผู้ป่วยทุกรายได้รับการตรวจเอกซเรย์คอมพิวเตอร์ซึ่งของกางและช่องท้องร่วมกับคลื่นแม่เหล็กไฟฟ้า อุ้งชิกรานก่อนผ่าตัด ผู้ป่วย 4 รายที่มีรอยโรคบริเวณลำไส้ตรงส่วนล่าง ได้รับรังสีรักษาร่วมกับเคมีบำบัดก่อนการผ่าตัดและได้รับการผ่าตัดภายใต้การผ่าตัดภายใน 8–12 สัปดาห์หลังจากรังสีรักษาและเคมีบำบัดวันสุดท้าย

ผลการศึกษา : ผู้ป่วยเป็นเพศหญิง 6 รายและเพศชาย 3 ราย อายุเฉลี่ย 61.0 ± 9.1 ปี (พิสัย 44–70 ปี) มะเร็งอยู่ที่ตำแหน่งร้อยต่อระหว่างลำไส้ใหญ่และลำไส้ตรง 4 ราย, ลำไส้ตรงส่วนกลาง 1 รายและลำไส้ตรงส่วนล่าง 4 ราย ระยะเวลาที่ใช้ในการผ่าตัด 210–480 นาที (เฉลี่ย 340 ± 95 นาที) เสียเลือดระหว่างการผ่าตัด 50–500 มล. (เฉลี่ย 161 ± 143 มล.) ระยะเวลาอนโนร์เจนพยาบาล 6–8 วัน (เฉลี่ย 7.1 ± 0.7 วัน) ผู้ป่วยทุกรายไม่มีภาวะแทรกซ้อนระหว่างผ่าตัดและหลังผ่าตัด ผลตรวจพยาธิวิทยาแสดงของเหลวการตัดเลาะท่อน้ำเหลืองที่เอาออกเพียงพอ

สรุป : การผ่าตัดลำไส้ตรงผ่านการส่องกล้องผ่าตัดช่องท้องด้วยเทคนิคการผ่าตัดจากด้านใกล้กลางมีประโยชน์อย่างมากในระยะสั้น การผ่านหลักสูตรฝึกอบรมหรือมีศัลยแพทย์ที่มีประสบการณ์ช่วยแนะนำสามารถช่วยให้การผ่าตัดบรรลุเป้าหมายได้ดียิ่งขึ้น

Introduction

Minimally invasive surgery has progressed over time, and one example is laparoscopic rectal cancer surgery. The first minimally invasive procedure was the laparoscopic appendectomy, which was initially created for gynecological diagnostic laparoscopy.⁽¹⁾ Subsequently, laparoscopic cholecystectomy was introduced in 1988⁽²⁾ and laparoscopic colectomy was proposed in 1991.⁽³⁾ In 1982, the concept of total mesorectal excision (TME) was introduced and reported to have a local recurrence rate of 5%.^(4,5) TME involves a precise dissection of the mesorectal envelope, which includes the rectum containing the tumor, surrounding fatty tissue, and the tissue sheet that contains lymph nodes and blood vessels. Dissection is along the avascular alveolar plane between the presacral and mesorectal fascia, also known as the “holy plane”.⁽⁶⁾ TME has become the “gold standard” treatment for rectal cancer worldwide.⁽⁷⁾

Laparoscopic rectal cancer surgery offers numerous advantages beyond a smaller incision size, including a quicker return of bowel function, decreased blood loss, reduced postoperative pain, and shorter hospital stays.⁽⁸⁾ However, there are a number of difficulties with the procedure, including a longer learning curve compared to laparoscopic colon cancer surgery, difficult retraction, and difficult intra-operative localization of the tumor.⁽⁹⁾ The American Society of Colon and Rectal Surgeons (ASCRS) clinical practice guidelines recommend that minimally invasive approaches to TME can be considered and should typically be performed by experienced surgeons with technical expertise.⁽¹⁰⁾

Laparoscopic rectal cancer surgery has been implemented at Lampang Hospital for a duration of 1 year. However, a comprehensive assessment of the surgical outcomes has yet to be conducted. The objective of this study is to demonstrate the short-term results of laparoscopic rectal surgery and share our experience with this technique.

Material and method

Between July 2022 and February 2023, nine patients with rectal cancer underwent laparoscopic rectal cancer surgery by a single surgeon at Lampang Hospital. Among these, laparoscopic intersphincteric resection (ISR) was performed on four patients, adequate mesorectal excision (AME) on one, and complete mesorectal excision (TME) on the other four.

Individual patient data were collected from medical records with the consent of each patient. The patients included three men and six women, with a mean age of 61.0 (SD 9.1) years (range, 44–70). Among them, four had lesions located in the rectosigmoid junction, one in the middle rectum, and four in the lower rectum. All patients underwent preoperative computerized tomography of the chest and abdomen, and pelvic magnetic resonance imaging. Four patients with lower rectal lesions received neoadjuvant concurrent chemoradiotherapy (CCRT) before surgery, which was performed within 8–12 weeks after the last date of CCRT.

Operative technique

The patient was placed in the modified lithotomy position with the chest tucked. A transumbilical incision with the Hasson technique was used to access the abdomen and create pneumoperitoneum for the camera port (12 mm). The working port placement and extraction incision⁽¹¹⁾ were illustrated in Fig 1 and 2. All cases were dissected using a medial-to-lateral approach. In the AME group, low ligation of the IMA with IMA node dissection was performed. High ligation of the IMA with splenic flexure mobilization was performed in the TME and ISR groups. Mesorectal mobilization followed the TME principle. In the AME and TME groups, distal rectal transection was performed, and the specimen was extracted through the Pfannenstiel incision.

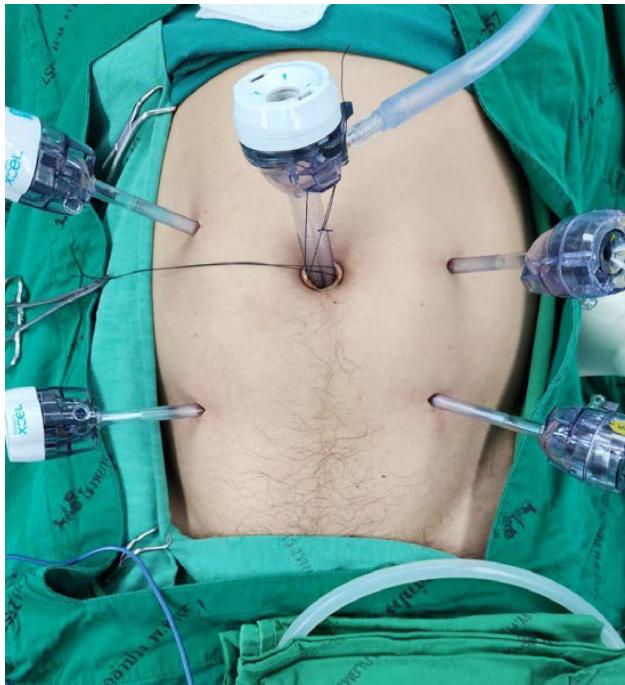


Fig 1 The working port placement of laparoscopic rectal cancer surgery.

Colorectal anastomosis was performed using the double stapler technique. In the ISR group, distal rectal transection was performed via transanal dissection starting at the dentate line. The specimen was extracted via the anus, and a handsewn coloanal anastomosis was performed. A protective loop ileostomy was matured at the right lower quadrant area.

Results

Four patients underwent laparoscopic AME with or without additional hysterectomy and salpingo-oophorectomy, while one patient received laparoscopic TME. Four other patients underwent laparoscopic intersphincteric resection with a protective loop ileostomy. Patient characteristics are presented in Table 1. There were no perioperative or postoperative complications. None of the cases were converted to open surgery.



Fig 2 The appearance of abdomen after laparoscopic AME with Pfannenstiel specimen extraction.

Operative results are presented in Table 2. The operative time ranged from 210 to 480 minutes (mean 340, SD 95), and the length of stay ranged from 6 to 8 days (mean 7.1, SD 0.7). Intraoperative blood loss ranged from 50 to 500 mL (mean 161, SD 143), and all cases had a rectal tube placed passing through more than 5 cm from the anastomosis to decrease the risk of anastomotic leakage. Early feeding was initiated on the same day of surgery with water, followed by liquid and soft diet within 3 days. Additional postoperative laboratory monitoring for anastomotic leakage detection included measuring c-reactive protein levels at postoperative day 3 and 5. The nearly complete TME specimen is shown in Fig 3. Pathological reports indicated adequate resection margins and lymph nodes, with the exception of one patient whose preoperative imaging and colonoscopy had suggested malignancy, and was instead reported as having chronic diverticulitis.

Table 1 Characteristics of nine patients who underwent laparoscopic rectal cancer surgery.

No.	Sex	Age (yrs)	Underlying disease	Body mass index	Preoperative staging
1	Female	61	None	25.9	3
2	Female	67	None	19.6	3
3	Female	69	HT , DLP	29.6	1
4	Female	70	None	17.7	2
5	Female	69	DM	22.2	2
6	Male	62	HT	20.3	3
7	Male	51	None	22.5	3
8	Male	56	None	22.7	3
9	Female	44	RA	20.6	3

Abbreviations : HT, hypertension; DLP, dyslipidemia; DM, diabetes mellitus; RA, Rheumatoid arthritis.

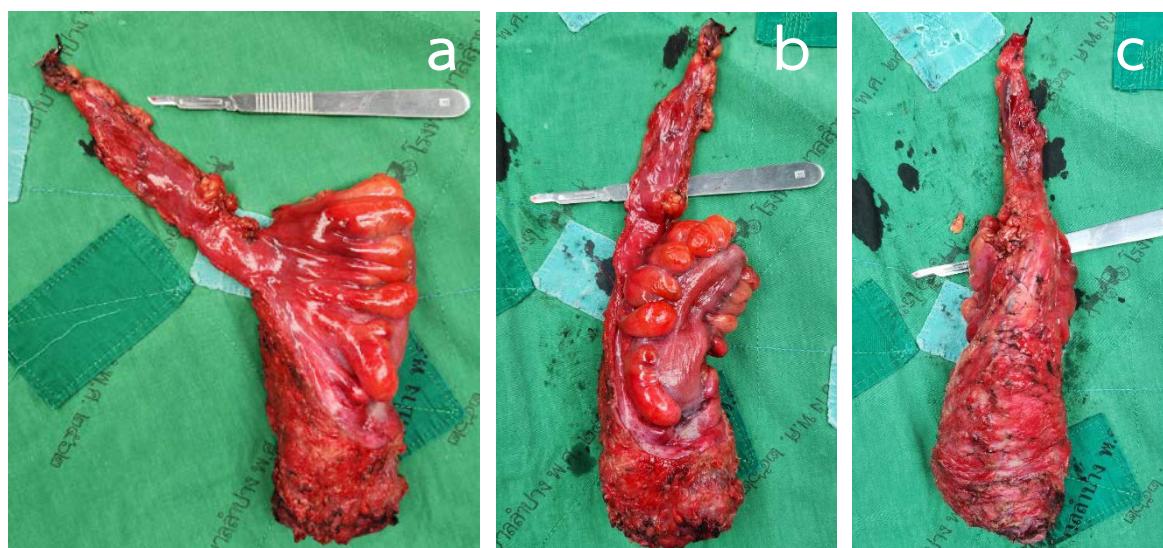


Fig 3 Anterior resection specimen from the laparoscopic rectal cancer surgery: anatomical view (a), anterior view (b), and posterior view (c).

Discussion

This study highlights the short-term benefits of laparoscopic rectal surgery, including decreased blood loss and a shorter length of hospital stay compared to traditional open surgery at Lampang Hospital. However, laparoscopic rectal surgery requires a longer operative time than open surgery and is more challenging due to anatomic features and limited techniques.⁽⁹⁾ The magnified view provided by laparoscopy can potentially lead to clinical advantages, such as negative radial margins, preservation of autonomic nerves, and avoidance of

ureteral injury, which may contribute to minimized blood loss.⁽¹²⁾ The Color II trial found earlier return of bowel function and shorter hospital stays with no significant differences in rates of anastomotic leakage, complications, or death.⁽¹³⁾

Similarly, the COREAN trial reported short-term benefits of the laparoscopic approach in decreasing blood loss, postoperative pain, and length of hospital stay.⁽¹⁴⁾ However, some studies have failed to demonstrate the noninferiority of laparoscopy compared with open surgery in long-term

Table 2 Operative results of nine patients who underwent laparoscopic rectal cancer surgery.

No.	Tissue diagnosis	Procedure	Operative time (mins)	Blood loss (mL)	Tissue pathology	Length of stays (days)
1	Chronic diverticulitis with salpingitis	AR with left SO	270	50	Chronic diverticulitis with chronic salphingitis	7
2	Rectosigmoid cancer invard uterus	AR with TLH with bilateral SO	420	50	Adenocarcinoma, DRM 6 cm., free CRM, LN 0/22, stage 2	6
3	Rectosigmoid cancer	AR	210	100	Adenocarcinoma, DRM 5 cm., free CRM, LN 0/13, stage 1	6
4	Rectosigmoid cancer with ovarian mass	AR with bilateral SO	420	50	Adenocarcinoma, DRM 7 cm., free CRM, LN 0/31, stage 2	8
5	Recurrent rectum cancer	LAR	240	500	Adenocarcinoma, DRM 4 cm, free CRM, LN 0/12, stage 2	7
6	Lower rectum cancer	partial ISR with PLI	240	300	Adenocarcinoma, DRM 2 cm., free CRM, LN 0/6, stage 2	8
7	Lower rectum cancer	partial ISR with PLI	480	200	Adenocarcinoma, DRM 2 cm., free CRM, LN 1/8, stage 3	8
8	Lower rectum cancer	partial IS with PLI	360	100	Adenocarcinoma, DRM 2 cm., free CRM, LN 2/14, stage 3	7
9	Lower rectum cancer	partial ISR with PLI	420	100	Adenocarcinoma, DRM 1.5 cm., free CRM, LN 0/13, stage 2	7

Abbreviations : AR, anterior resection; LAR, low anterior resection; ISR, intersphincteric resection; PLI, protective loop ileostomy; TLH, total laparoscopic hysterectomy; SO, salphingo-oophorectomy; LN, lymph node; CRM, circumferential resection margin; DRM, distal resection margin.

outcomes.^(10,15,16) According to the currently available literature, the ASCRS guideline has recommended a statement grade of 1A for minimally invasive surgery (MIS) for rectal cancer as of the 2020 guidelines, as opposed to 1B in the 2013 guidelines.^(10,17) Laparoscopy rectal surgery consists of many basic laparoscopy techniques and is not more complex than other laparoscopic procedures. This study's limitations include the lack of a comparison group and confirmation bias, and further prospective studies are needed to validate the power of the findings.

Conclusion

Laparoscopic rectal surgery utilizing the medial approach technique provides numerous short-term benefits, including reduced blood loss, shorter hospital stays, improved cosmesis, and a faster return of bowel function, and is considered a safe treatment option. The inclusion of a supervisory surgeon or a structured training program can aid in achieving a steeper learning curve in this technique.

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