

A Retrospective Study of Laparoscopic Assisted Surgery in Colorectal Cancer

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Abstract

Introduction: Colon cancer represents one of the leading causes of death worldwide, and the indications for laparoscopic surgery have expanded gradually. Indeed, laparoscopic colorectal resection has been shown to have more benefits for postoperative recovery, such as postsurgical pain and hospital stay, and long-term survival, leading to a general acceptance of laparoscopic surgery as an alternative to conventional open surgery for colon cancer.

Materials and Methods: This is a retrospective descriptive study, we have analysed 30 patients who are admitted at M.G.M Medical College, between the period January 2018 to December 2018 diagnosed with colorectal cancer. Inclusion criteria include clinical diagnosis of colorectal adenocarcinoma with histological confirmation, and the absence of abdominal adhesions. Exclusion criteria included locally advanced disease, metastatic disease, acute bowel obstruction or perforation from cancer, severe medical illness, pregnancy and recurrent cancer. All patients underwent mechanical bowel preparation on the day before the operation and also advised to take liquid diet only a day before the operation. Pre-operatively, antibiotics were given and continued thereafter for a day or two.

Results: This preliminary data suggests that rectal cancer resection can be performed by laparoscopy in accordance with established principles of cancer therapy. Operative time was 190 - 240 minutes, reduced postoperative morbidity rate. The mean length of hospital stay was 10 days (post-operative stay- 3-5 days) and hence shorter post-operative hospital stay and briefer use of parenteral narcotics and oral analgesics are also noted. In the laparoscopic surgery, average yield was 16 lymph nodes, adequate lymphadenectomy was achieved in 70% of cases. There is slight increase in hospital costs.

Conclusion: Laparoscopic approach is an acceptable alternative to open surgery for colorectal cancer in select cases. It is also as safe and effective as conventional open surgery in the treatment of colorectal cancer, and was associated with increased operative time, shorter hospital stay, less morbidity improved quality of life, and slightly increased hospital costs.

Key Words: Colon cancer, Pregnancy, abdominal adhesions.

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I. Introduction

Colon cancer represents one of the leading cause of death worldwide, and the indications for laparoscopic surgery have expanded gradually. Indeed, laparoscopic colorectal resection has been shown to have more benefits for postoperative recovery, such as postsurgical pain and hospital stay, and long-term survival, leading to a general acceptance of laparoscopic surgery as an alternative to conventional open surgery for colon cancer.¹ However, despite the theoretical advantages of laparoscopic surgery, it is still not considered the standard treatment for colorectal cancer patients because of criticism concerning oncologic stability. Potential risks regard port-site recurrence after curative resection of tumor and incomplete lymph node dissection. In fact, given the technical difficulty of this treatment, laparoscopic colorectal resection is often limited by the need for experienced surgeons.²

Thus, from a public health perspective, there are controversies regarding the cost-effective value of this treatment, taking into account such issues and the greater economic costs compared with conventional surgery.³

Globally, nearly 12, 00, 000 new colorectal cancer cases are believed to occur, which accounts for approximately 10% of all rectal cancer, and mortality from colorectal cancer estimated at nearly 609, 000.⁴ In almost all countries, age-standardized incidence rates are less for women than for men, there has been a dramatic increase in younger patients. A new study using data from the Surveillance Epidemiology and End.⁵

Results (SEER) program found a rising incidence of CRC over the last 20 years in patients aged 20 to 49. The most pronounced growth was in the age group 40 to 44 where colon and rectal cancer increased 56% and 94% respectively.⁶ Based on these findings and the fact that CRC in younger patients tends to be more advanced, the authors recommend lowering the age for average risk screening by 10 years.^(2,3) The past two decades have witnessed substantial improvements in the survival from colorectal cancer resulting from earlier diagnosis due to improved efficiency and delivery of chemotherapy and radiotherapy, and advances in surgical techniques such as total mesorectal excision.⁸

II. Materials And Methods

This is a retrospective descriptive study, we have analysed 30 patients who were admitted at M.G.M Medical College, between the period January 2018 to December 2018 diagnosed with colorectal cancer.

Inclusion criteria include clinical diagnosis of colorectal adenocarcinoma with histological confirmation, and the absence of abdominal adhesions. Exclusion criteria included locally advanced disease, metastatic disease, acute bowel obstruction or perforation from cancer, severe medical illness, pregnancy and recurrent cancer.

All patients underwent mechanical bowel preparation on the day before the operation and also advised to take liquid diet only a day before the operation. Pre-operatively, antibiotics were given and continued thereafter for a day or two.

Patients were informed about the procedure, risks and possible intraoperative and postoperative complications and informed written consent taken. The operation was performed according to conventional classical descriptions based on the oncologic principles described by Heald for resection of mesorectum. For laparoscopically assisted resections, a pneumoperitoneum achieved by using CO₂ gas, the flow used was 2 liters per minute to maintain maximum working pressure of 12 mmHg

Patients with adenocarcinoma of the rectum within 5 cm from the anal verge underwent abdominoperineal resection and those with tumor above 5 cms. underwent anterior resection. The ports were arranged as follows: 10 mm trocar in the umbilical region for camera 5 mm trocar on a line represented by the intersection 2 cms. superior to the anterior superior iliac crest and right lateral border of the rectus abdominis muscle; 5 mm trocar on the right flank, and 5 mm trocar on the left flank.

The patient is placed in Trendelenburg position and tilted to the right. The small bowel is placed in the right upper quadrant, used a medial-to-lateral approach. The inferior mesenteric vessels are identified at their origin, the peritoneum is incised in this plane and the ureter identified. Once this is completed, the vessels are ligated using clips or energy devices are also used. Once the Vessels are ligated, the plane under the mesocolon is developed laterally and superiorly. With the transacted vascular pedicle retracted, dissection then proceeds down into the pelvis, toward the promontory, where the hypogastric nerves were identified and preserved. The retro rectal pelvic space, the lateral wings and the anterior rectal wall were dissected, further dissection continued till the levator ani muscle. During laparoscopic surgery, narrow spaces such as the lower pelvis are better visualized than in open surgery owing to the use of a laparoscope. For rectosigmoidectomies we sought to ensure the bowel wall distal margin of at least 2 cms and perirectal fat margin of 4 cms and proximal margin of 5 cms. Extraction of specimen may be done in the left flank or via a Pfannenstiel incision.

Descriptive variables like age and gender, whereas outcome variables like type of resection, number of resected lymph nodes, proximal. Distal and circumferential margin need for ostomy, complications, operating time and hospital stay are noted and analysed.

III. Results

30 patients underwent laparoscopic surgery for colorectal cancer between January 2018 and December 2018, of which 16 patients were male. Youngest patient was 29-year-old, and oldest being 76 years. Mean age was 52 years. The range being 29-76 years.

Location of the tumor within 5 cms. from anal verge was observed in 22 patients who underwent lap abdominoperineal resection and in others the tumor was more than 5 cms. above the anal verge so remaining 8 patients underwent lap anterior resection. Out of 30 patients, T stage was T1 = 0, T2 in 18 cases and T3 in 11 cases, T4 in 1 patient, regarding N staging, N0 =16, N1 =4, N2=8, N3=2.

In all patients proximal and distal and circumferential margins were free of tumor except in one patient circumferential margin was positive, all patients had adequate proximal margin, proximal margin was more than 5 cms in 94% of cases. But the distal margin was less than 2 cms in 10% of cases, least being 0.4 cms in one patient meaning 90% patients had distal margin more than 2 cms.

Two patient required conversion to conventional surgery. Protective colostomy was done in one patient. Operating time ranges from 190 - 270 minutes, with most cases taking more than 4 hours.

National Comprehensive Cancer Network (NCCN), the College of American Pathologists, and the American Joint Committee on Cancer (AJCC) suggest a minimum of 12 lymph nodes to establish the N stage.

Adequate lymphadenectomy (removal of at least 12 lymph nodes) was achieved in 70% of Patients, maximum and minimum lymph nodes harvested in a case is 33 and 3. Average lymph node removed were 15.

According to the literature, the number of lymph nodes removed varies by age, gender, tumour grade, and location of the tumour.

There were no intraoperative complications, decreased postoperative mortality, no readmission, no anastomotic leak. Patient had less postoperative pain resulting in decrease use of parenteral narcotics and oral analgesics. Early mobilisation of the patient and early recovery of peristalsis were also noted. Postoperative stay was 3-5 days, Patients who underwent anterior resection [AR] went home early compared to patient who underwent APR.

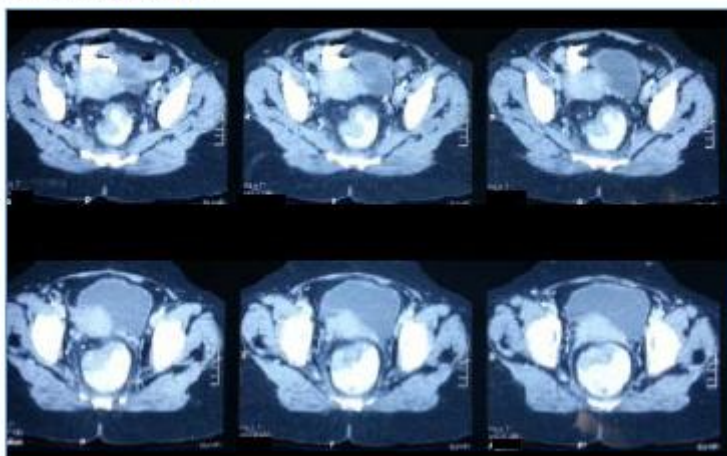
| Characteristic | Male | Female | Total |
|---|-------|--------|-------|
| Numbers | 16 | 14 | 30 |
| Youngest | 29 | 38 | |
| Oldest | 75 | 76 | |
| Range | 29-75 | 36-76 | |
| Tumor 5 cms above the Anal Verge | 4 | 4 | 8 |
| Tumor within 5 cms from Anal Verge | 13 | 9 | 22 |

Table 1: Table Representing Age Distribution & Position of Tumour from Anal Verge

| Characteristic | Male | Female | Total |
|--|------|--------|----------|
| LAP APR | 13 | 9 | 22 |
| LAP AR | 4 | 4 | 8 |
| Proximal margin of specimen >5 cms achieved in | 16 | 12 | 28 (94%) |
| Not achieved | 0 | 2 | 2 (6%) |
| Distal margin of >2 cms achieved in | 15 | 12 | 27 (90%) |
| Not achieved in | 1 | 2 | 3 (10%) |
| Circumferential margin positive | 1 | 0 | |
| Well differentiated grade | 1 | 2 | 3 |
| Moderately differentiated grade | 10 | 9 | 19 |
| Table 2: Representing Lap Abdomino-Perineal Resection (APR) And Lap Anterior Resection (AR) | | | |
| Poorly Differentiated Grade | 5 | 3 | 8 |
| T1 | 0 | 0 | 0 |
| T2 | 10 | 8 | 18 |
| T3 | 6 | 5 | 11 |
| T4 | 0 | 1 | 1 |

Table 3 : Representing T(Tumour) Status

CECT Scan Pelvis



Picture Representing Lymphadenectomy



Laparoscopic Pictures



APR Specimen



AR Specimen

IV. Discussion

It's a retrospective study. Our data suggest that the operative factors, like extent of resection, the number of lymph nodes sampled, the length of bowel and mesentery resected, and the bowel margins like proximal distal and circumferential, are adequate did not differ significantly with conventional surgery.⁹

The operative time of laparoscopic surgery was significantly higher than the conventional surgery. This can be explained by the learning curve involved in surgical procedures. One of the drawbacks of laparoscopy being the loss of tactile information provided by traditional surgical techniques.¹⁰

A systematic review from 2007 that analysed 17 studies of 61, 371 patients showed the association between the number of lymph nodes removed and the oncological results concluded that the number of lymph nodes removed was positively associated with the survival of patients with stage II and III colorectal cancer.

V. Conclusion

Our data suggests that rectal cancer resection can be performed by laparoscopy in accordance with established principles of cancer therapy, Laparoscopic approach was as safe and effective as conventional surgery in the treatment of colorectal cancer, and was associated with increased operative time, less use of parenteral narcotics and oral analgesics, early mobilisation of patient, shorter hospital stay and decrease in morbidity. The hospital costs were slightly higher. It is also important to note that the cost per procedure is

double than the open procedure and carting to high volume lower socioeconomic group patients offering laparoscopic procedure for all rectal cancers has to be analysed on a large scale.

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