

# Study to Determine the Short-Term Outcomes of Laparoscopic Colonic Surgery

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## ABSTRACT

**Introduction:** The article presents early Outcomes in laparoscopic colorectal surgery according to tumour size, duration of surgery, duration of postoperative analgesic requirements, recovery of bowel function, postoperative complications, and mortality.

**Aim:** The aim of the analysis is to describe the short-term outcomes of our patients who endured laparoscopic colonic surgery because of various colon pathologies.

**Study Design:** A Retrospective Case Review cohort study.

**Methods:** The surgical and clinical records of all laparoscopic assisted colon procedures were reviewed and selected for the study held in the Surgical department of Social Security Landhi Hospital Karachi for two years duration from June 2019 to June 2021. All patients underwent surgery under general anaesthesia.

**Results:** During this period, 62 total laparoscopic assisted colon (LAC) procedures were achieved. 41 were male and 21 females. 54 patients underwent cancer surgery out of which 51 patient had adenocarcinoma of colon, 2 patient had carcinoids of bowel, and 1 patient had Hodgkin's lymphoma. Ileocecal tuberculosis was noted in 5 patients and submucosal polyps in one patient. Of these 54 procedures for colonic cancer, 12 were left hemicolectomy, 34 right hemicolectomy, 2 segmental splenic flexure resections, 3 segmental resection with transverse colectomy and 3 sigmoid colectomy. The average time of LAC surgery was 140 minutes (range 60 to 250). The average duration of analgesic drugs was 3 days (range 3–6). The median time to the first movement in the bowel was 2.5 days (range 2–4) and the hospital stay was 6 days (range 5–10).

**Conclusions:** Laparoscopically assisted colon procedures are associated with early return of bowel function, less analgesic consumption, short hospital stays, and a lower rate of post operative complication. Laparoscopic colorectal surgery is achievable with optimum operative time and is a logical advantage for good operative outcomes with advanced laparoscopic skills.

**Keywords:** Laparoscopically assisted colon surgery, laparoscopy and Colon cancer.

## INTRODUCTION

Laparoscopic surgical procedure has shown proven benefits in Nissen fundoplication, appendectomy and cholecystectomy. Though, laparoscopic assisted colonrectal surgery has slowly gained widespread acceptance. The colorectal surgery by laparoscopy has not gain progress very much for minimally invasive surgery, as it is multi-quadrant, frequently multifaceted and associated with treatment of cancer. Firstly, laparoscopic colonic Surgery (LCS) was done by Jacob in 1990. However, the method evolved more slowly, as it took a lot of time, with a technically rigorous and steep learning curve. Initial concerns about resection radicalization, particularly in the suitability of lateral and distant edges of removal of lymph nodes, as well as early reports of a high recurrence rate at the port site, have inadequate extensive usage of laparoscopic collectively in the cancer treatment. Lately, there is growing evidence about the significant benefits of Laparoscopic Colorectal surgery, including less pain, less postoperative analgesia, early bowel function, shorter hospital stays, and lower postoperative morbidity. In adding, several randomized and prospective studies have concluded that initial concerns about the results of LCS oncology are unfounded. In particular, three clinical trials: CLASICc, COLOR and COST Level one statistics were provided to support LCS in colon cancer. The aim of the analysis is to describe the short-term results of our patients who endured LCS as a result of various colon pathologies.

## MATERIAL AND METHODS

This study covers all laparoscopically assisted colon (LAC) surgeries done in the Surgical department of Social Security Landhi Hospital Karachi for two years duration from June 2019 to June 2021. The single surgeon performed all the surgeries. The selection of early patients was limited to patients with benign

diseases, but gradually, with increasing experience, this method was also accessible to subjects with malignant tumours. All cases underwent surgery under general anaesthesia. The right colectomies were performed in the supine position, while in the case of the left colectomies, the Lloyd-Davies modified position was used. Standard thromboembolic prophylaxis was given in the thromboembolic Deterrent (T.E.D.) form, low molecular weight heparin (enoxaparin) and pneumatic compression stockings. Veress needle injection was used initially for insertion of a 10 mm trocar and four trocars were used in all cases. Carbon dioxide was used for Pneumoperitoneum and the abdominal cavity pressure was maintained at 12–15 mmHg. The 5mm, 10mm or 12mm posterior trocar was placed under direct laparoscopic vision. 0-, 30- and 45-degree telescopes were used. Dissection was facilitated using harmonic scissors

Table-1 shows the demographic features of the patients

Age	47years( range 23-80)
Gender (%)	
Male	41 (66.1%)
Female	21 (33.9%)
ASA (%)	50 (80.6)
1	
2	7 (11.3)
3	5 (8.1%)
4	0
TNM Stage (%)	2 (3.2%)
I	
II	12 (19.4%)
III	41 (66.1%)
IV	07 (11.3%)

(Ethicon Endo-Surgery, Harmonic Scalpel, USA), monopolar diathermy or Ligasure (Valleylab). The typical dissection with

medial to lateral technique was achieved in all subjects and with benign disease, technique was used in three patients. The intestine was extra-corporeally from the body, after proper mobilization, through an incision large enough to easily remove and cut the diseased section of the bowel. Endo-GI staples were applied in 29 patients, and the remaining patients were sewn by single-layer anastomosis using Vicryl. In the specified areas, Peritoneal drains were sited. Postoperative painkillers were directed via patient-controlled analgesia (PCA) pumps, epidural catheters, or NSAIDs/ intravenous opioids. When oral feeding was tolerated by the patients, they became relieved of oral analgesics.

**RESULTS**

During this period, 62 total laparoscopic assisted colon (LAC) procedures were achieved. 41 men and 21 women contributed in the analysis. Their average age was 47 years (23-80). (Table 1)

Table 2: Indications for Surgery

Cancer	54 (87.1%)
Adenocarcinoma	51
Carcinoid	2
Non-Hodgkin's lymphoma	1
Ileocecal tuberculosis	06 (9.62%)
Polyp	1

54 patients underwent Laparoscopic colonic resection for cancer surgery: 51 adenocarcinoma, two carcinoids, and one Hodgkin's lymphoma. Ileocecal tuberculosis was noted in 5 patients and submucosal polyps in one patient. Of these 54 procedures, 12 left hemicolectomies, 34 included right hemicolectomy, 2 segmental splenic flexure resections, 3 segmental resection with transverse colostomy and 3 sigmoid colectomies (Table 2).

5 of these LCS 54 surgeries were opened for the following reasons: 1 due to excessive venous haemorrhage, 3 due to locally advanced disease in which the tumour invaded the abdominal wall and adjacent intestines, and 1 due to unable to confine the tumour.

Among these, Right hemicolectomy was performed in three patients, one sigmoid and one left hemicolectomy was done. All 40 right hemicolectomies had extracorporeal anastomoses using a linear Proximate cutter and hand-sutured anastomoses in 14 cases. The hand sewn left sided hemicolectomy was done in 12 cases which was extra-corporeally constructed.

Three sigmoid colectomy was performed extra-corporeally after intestinal mobilization, and after resection of the segment, intra-corporeal anastomosis was performed with a curved Proximate® ILS intralumen stapler later to resection of segment. Three subjects with progressive colorectal adenocarcinoma underwent segmental resection with transverse colostomy preceding to neoadjuvant treatment. Histopathological examination of samples removed from 54 patients with adenocarcinoma revealed the size of T1 tumor in two patients, T2 in 12, T3 in 41, and T4 tumours in seven patients. The average tumour size was 7 cm (3–11 cm). The average number of lymph nodes removed is 22 (7 to 27). (Table 3)

Table 3: Perioperative Outcomes

Mean operative time	140 minutes
Range	60-250 minutes
Number of conversions to open	5
Mean tumour size	7 cm
Range	3-11cm
Mean number of lymph nodes harvested	22
Range	7-27
Mean duration of analgesic requirement	3 days
Range	3-6 days
Mean time to first bowel movement	2.5 days
Range	2-4 days
Mean length of hospital stay	6 days
Range	5-10 days

The average time of Laparoscopic Assisted Colon surgery was 140 minutes (range 60 to 250). The average duration of analgesic drugs was 3 days (range 3–6). The median time to the first movement in the bowel was 2.5 days (range 2–4) and the hospital stay was 6 days (range 5–10). (Table 3)

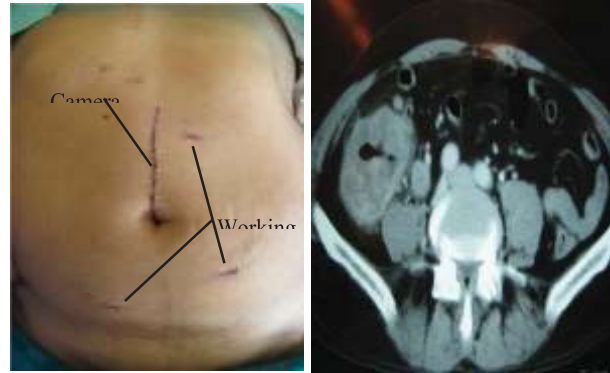


Figure 1: Wounds following Laparoscopic Right Hemicolectomy  
Figure 2: Tumour right colon

**DISCUSSION**

Colon resection has evolved over the past decade. In the 1960s, Turnbull and colleagues proposed a “tactile” technique against colon cancer, recommending early ligation of mesocolic vessels to prevent cell proliferation and atraumatic manipulation of the tumor<sup>10-11</sup>. Eggermont and colleagues demonstrated the value of reducing surgical trauma to cancer in an experimental study. In laparoscopic surgery, the peritoneum is inserted through small incisions, manual retraction of the internal organs is avoided, and blood loss is minimal as a result of severe dissection accompanied by videoscopic enlargement<sup>12-13</sup>. Recently published series have shown that the incidence rate after laparoscopic surgery is lower than after traditional open surgery<sup>14</sup>. These include reducing postoperative pain, rapid recovery of digestive function, shorter hospital stays, faster recovery, and less immunosuppression. The results of this study are comparable to the requirements for postoperative analgesics, recovery of intestinal function, and total hospitalization time reported in the literature<sup>15-16</sup>. Recent meta-analyses, compliance reports, and large randomized controlled trials of more than 3,500 procedures showed better results: hospital stays were reduced by approximately 20% due to less pain and short duration of paralytic ileus<sup>17-18</sup>. It is well known that the transition from open laparoscopic surgery varies in research: from 7% to 25% in large batches and from 2% to 41% in smaller batches. Although the conversion itself is not a complication, it is associated with an increase in postoperative morbidity. Risk factors associated with conversion to open surgery, such as BMI, tumour volume, adhesions, and surgical experience, are well described in the literature<sup>19-20</sup>. The cut segments had proximal and distal edges of at least 5 cm and all edges were reported to be tumour-free according to the latest histopathology. The average number of lymph nodes removed in this series was 22 according to cancer regulations. These results are comparable to the published literature.<sup>21-22</sup>

**CONCLUSION**

Laparoscopically assisted colon surgery is associated with a smaller wound, faster recovery of bowel function, less pain, a short hospital stays, and a lower rate of lung infection. Laparoscopic colon surgery can be achieved effectively and safely. Though, it has a steep curve of learning. Afterward acquisition of self-confidence in laparoscopic surgery, the use of it in colon diseases is a logical advantage for good operative outcomes achieved by advanced laparoscopy skills.

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