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ORIGINAL ARTICLE

Early Experience of Laparoscopic Colonic Surgery and its Associated Factors

FAIZ UR RAHMAN[1], SAADIA NAWAZ DURRANI[2], MUHAMMAD ZAFAR IQBAL[3], MOHAMMAD SHOAIB KHAN[4], KANWAL[5], MALIK IRFAN AHMED[6]

[1]*Associate Professor General Surgery, Gajju Khan Medical College, Swabi*
[2]*Assistant Professor Surgery, Naseer Teaching Hospital/ Gandhara Medical University, Peshawar*
[3]*Assistant Professor General Surgery, Rawalpindi Medical University/ District Headquarters Teaching Hospital, Rawalpindi*
[4]*Assistant Professor General Surgery, Khalifa Gul Nawaz Medical Teaching Institute, Bannu*
[5]*Consultant General Surgeon, Jinnah Postgraduate Medical Centre, Karachi*
[6]*Senior Registrar General Surgery, District Headquarters Teaching Hospital, Rawalpindi*
Corresponding author: Saadia Nawaz Durrani, Email: drsaadianawaz@gmail.com, Cell: +92 333 9111651

ABSTRACT

Aim: The research discusses the indications, tumour size, operational time, duration of analgesic required postoperatively, postoperative complications, recovery of bowel function and mortality associated with laparoscopic colonic surgery.

Methods: This Case series studies were undertaken at the surgical department of DHQ Teaching Hospital, Rawalpindi and Bacha Khan Medical Complex, Swabi for duration of one year from 15th September 2020 to 15th September 2021. Clinical and operational data were collected from all laparoscopic-assisted colonic surgeries.

Results: During this time, 85 laparoscopic-assisted colonic procedures were conducted. There were 76 carcinoma cases, 6 TB cases, and 3 polyp cases. From all, 60 cases were of right hemicolectomy, 12 cases of left hemicolectomy were performed, 5 cases of sigmoid colectomy were performed, 6 cases of segmental resection of splenic flexure were performed, and 2 cases of transverse colostomy were performed. Four cases were converted to open surgery due to locally advanced disease, one due to haemorrhage, and one due to failure to distinguish the tumour. The average time of the surgery was 140 minutes. The tumours were on average 5 cm in diameter. The average duration of analgesic use was 2.2 days. The average time for bowel activity to recover was 2.9 days, with a 6-day hospital stay. In one patient, traction injury to the small intestine occurred during surgery. Two patients got local wound infection after surgery, and two patients acquired lung infection.

Conclusions: Colonic surgeries with laparoscopic assistance are linked with a smaller incision, a faster resumption of bowel activity, less painkiller use, a shorter hospital stay, and low incidence of pulmonary infection. Colon surgery may be performed laparoscopically and is an excellent first step toward obtaining advanced laparoscopic outcomes

Keywords: Laparoscopy, Laparoscopic assisted colonic surgery, Colon cancer

INTRODUCTION

Cholecystectomy, Nissen's fundoplication, and appendicectomy have all been successfully performed using laparoscopic surgery. Laparoscopic colonic surgery, on the other hand, has taken a long time to obtain universal acceptability[1-2]. Because it is generally complicated, multi-quadrant, and often includes the treatment of a cancer, one of the slowest areas of progress in minimally invasive surgery has been laparoscopic colonic surgery[3-4]. In 1991, Jacobs published the first report on laparoscopic colon resection (LCR). The process, on the other hand, has taken longer to develop since it is deemed technically tough, time-consuming, and has a high learning curve. Early concerns about the resection's radicality, The use of laparoscopic colectomy for cancer was limited due to concerns about the quality of the lateral and distal margins and lymph node clearance, as well as reports of a high risk of port site recurrence[5-6].There has recently been a growing literature confirming the major benefits of LCR in terms of reduced pain, less postoperative analgesics, early bowel activity return, shorter hospital stays, and decreased rates of postoperative morbidity[7-8]. Furthermore, multiple prospective, randomised investigations have demonstrated that earlier fears about LCR oncologic outcomes were unwarranted. The COST, COLOR, and CLASSIC clinical trials, in particular, have shown level 1 evidence in favour of LCR for colon cancer[9-10]. Specifically, the goal of this research is to look at the short-term results of our patients who have had laparoscopic colonic resection for a variety of colonic diseases.

MATERIALS AND METHODS

This Case series studies were undertaken at the surgical department of DHQ Teaching Hospital, Rawalpindi and Bacha Khan Medical Complex, Swabi for duration of one year from 15th September 2020 to 15th September 2021. The patients' clinical and surgical records were examined to acquire clinical data, intraoperative parameters, and determine their postoperative outcomes. The same surgeon did all of the operations. Patient pre-selection was limited to benign conditions, but with increasing experience the technique has also been offered to cancer patients. All of the surgeries were carried out under general anaesthetic. Right-sided colectomies were done in the supine position, whereas left-sided colectomies were conducted in the modified Llyod-Davies position. Standard thromboembolic prophylaxis included T.E.D. stockings, pneumatic calf compression stockings, & low molecular weight heparin are all options (Enoxaparin) were given. A Veress needle insufflation was used to insert a 10 mm trocar, and four trocars were used in all cases. Carbon dioxide was used to induce pneumoperitoneum, and an intra-abdominal pressure of 12–15mm Hg was maintained. Following that, trocars with diameters of 5mm, 10mm, and 12mm were inserted under direct laparoscopic visualisation to complete the procedure. Three different focal length telescopes were used, with focal lengths of 0o, 30o, and 45o. Using harmonic shears (the Harmonic Scalpel, manufactured by Ethicon Endo-Surgery, Inc., Cincinnatti, OH, USA), the Ligasure (developed by Valleylab), and/or monopolar diathermy made dissection simpler. The intestine was delivered extracorporeally after appropriate mobilization through an incision large enough to allow easy removal and excision of the diseased section. Endo-GI staples were used in 28 patients, whereas the remainder had single layer anastomosis done by hand with Vicryl®. Where indicated, peritoneal drains were inserted in situ. Intravenous opioids, epidural catheters, or patient-controlled analgesia (PCA) pumps /NSAIDs were used to give postoperative analgesics. Once the patient could tolerate oral food, they were switched to oral analgesics.

RESULTS

During this time, 85 laparoscopic-assisted colonic (LAC) surgeries were conducted. There were 64 men and 21 women among the patients. Their average age was 45 years old (range, 25 to 85). (See Table 1) Table 2 lists the diagnosis of these 85 individuals. There were 76 carcinoma cases, 6 TB cases, and 3 polyp cases. There were 85 operations performed, from all, 60 cases were of right hemicolectomy, 12 cases of left hemicolectomy were performed, 5 cases of sigmoid colectomy were performed, 6 cases

of segmental resection of splenic flexure were performed, and 2 cases of transverse colostomy were performed. (Table 2).

Table 1: Patient Demographics

Age	45years(range 25-85)
Gender (%) Male	64 (75.3)
Female	21 (24.7)
ASA (%) 1	68 (80)
2	11 (12.9)
3	5 (5.9%)
4	1(1.2%)
TNM Stage (%) I	2 (2.4)
II	20 (23.5)
III	47 (55.3)
IV	07 (8.2)

Table 2: Indications for Surgery

Cancer	76 89.4%
Carcinoid	06
Adenocarcinoma	67
Ileocecal tuberculosis	06 7.1%
Non-Hodgkin's lymphoma	03
Polyp	03

Four cases were converted to open surgery due to locally advanced disease, one due to hemorrhage, and one due to failure to distinguish the tumour.

Extracorporeal anastomoses were constructed in 41 of the 60 right hemicolectomies using a Proximate® Linear Cutter and manually stitched anastomoses in the other 19. Hand-sewn anastomosis were made extra-corporeally for the 12 left-sided colectomies. The segment was administered extra-corporeally after bowel mobilisation, and an intra-corporeal anastomosis was created after resecting the segment using 1 Proximate® ILS Curved Intraluminal Stapler.

Prior to undergoing neo-adjuvant treatment, four patients with advanced colorectal cancer had a transverse colostomy fashioned. Two patients had T1 tumour size, 20 had T2, 47 had T3, and 7 had T4 tumour size, according to histopathological analysis of resected tissues from 67 patients with adenocarcinoma. The average tumour size was 5cm in diameter (range 2-12cm). A total of 26 lymph nodes were extracted on average (range 5 to 29). (See Table 3)

Table 3: Perioperative Outcomes

Mean time of surgery	140 minutes
Range	70-250 minutes
Number of open conversions	6
Mean size of tumour	5 cm
Range	3-11cm
Mean number of harvested lymph nodes	26
Range	5-29
Mean analgesic prerequisite duration	2.2 days
Range	3-6 days
Mean duration to first bowel movement	2.9 days
Range	2-5 days
Mean hospital stays duration	6 days
Range	5-11 days

LAC procedures took an average of 140 minutes to complete (range 70 to 250). The average time using analgesics was 2.2 days (range 3-6). The average period from first bowel movement to discharge was 2.9 days (range 2-5), while the average length of stay in the hospital was 6 days (range 5-11). (See Table 3) Inadvertent traction caused intraoperative damage to the small intestine in one patient. A serosal stitch was used to fix this. Following surgery, two patients developed wound infections. Antibiotics and bandages were used to treat the infection. Three individuals who had sigmoid colectomy developed a chest infection. Antibiotics were used as a last resort.

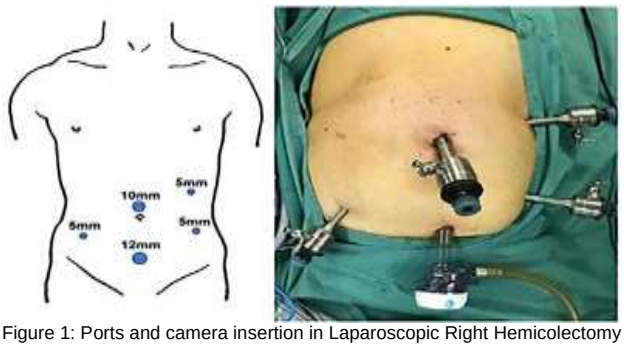

Figure 1: Ports and camera insertion in Laparoscopic Right Hemicolectomy

DISCUSSION

Colonic resection has progressed throughout the years. In the 1960s, Turnbull et colleagues proposed the "no-touch" approach for colonic cancer, which advocated early closure of mesocolic arteries and atraumatic manipulation of the tumour to prevent cells from spreading[11]. In an experimental investigation, Eggermont et colleagues proved the importance of decreasing surgical trauma in cancer patients. Because of the precise dissection allowed by videoscopic magnification, peritoneal access is acquired via tiny incisions, manual retraction of viscera is eliminated, and blood loss is limited in laparoscopic surgery[12]. Recent studies have shown that the morbidity associated with laparoscopic surgeries is lower than that associated with standard open procedures[13]. Postoperative pain is reduced, gastrointestinal function is quickly restored, hospital stays are shorter, convalescence is faster, and immunosuppression is reduced. The findings of this research in terms of postoperative analgesic demand, bowel activity return, and overall hospital stay are similar to those described in the literature. A meta-analysis, consensus report, and more recent large randomised trials in over 3500 surgeries have showed better outcomes: hospital stays are decreased by around 20% as a result of lower discomfort and paralytic ileus length[14-15]. The rate of laparoscopic to open surgery conversion varies amongst research, ranging from 7% to 25% in big series and 2% to 41% in smaller series. Although conversion is not a problem in and of itself, it is linked to a higher rate of postoperative morbidity[16]. BMI, excessive tumour size, adhesions, and surgical experience are among the 26 risk variables linked with conversion to open surgery that have been thoroughly reported in the literature. In this study, 8 patients (10%) received open surgery conversion. As stated in the literature, effective patient selection is critical, as is making the choice to convert sooner rather than later[17-18]. The large proportion of individuals with stage III illness is an intriguing component of the research (65 percent). These patients recovered well after surgery and are being monitored for tumour recurrence and survival. Two patients had chest infections, bringing the total complication incidence to 5%.[19] Following LAC, there is a lower risk of postoperative complications, notably respiratory issues, according to the literature. There were at least 5cm proximal & distal margins on all of the segments that were removed and certified tumor-free on histology.in this series, the average number of lymph nodes taken was 20, which is consistent with solid oncologic principles[20-21]. These findings are in line with previous research. Colonic resection has progressed throughout the years. In the 1960s, Turnbull et colleagues proposed the "no-touch" approach for colonic cancer, which advocated early closure of mesocolic arteries and atraumatic manipulation of the tumour to prevent cells from spreading. In an experimental investigation, Eggermont et colleagues proved the importance of decreasing surgical trauma in cancer patients. Because of the precise dissection allowed by videoscopic magnification, peritoneal access is acquired via tiny incisions, manual retraction of viscera is eliminated, and blood loss is limited in laparoscopic surgery. Recent studies have shown that the morbidity associated with laparoscopic surgeries is lower than that associated with standard open procedures[22]. Postoperative

pain is reduced, gastrointestinal function is quickly restored, hospital stays are shorter, convalescence is faster, and immunosuppression is reduced. The findings of this research in terms of postoperative analgesic demand, bowel activity return, and overall hospital stay are similar to those described in the literature. Hospital stays are reduced by around 20% because of reduced pain and paralytic ileus duration in a meta-analysis, consensus report, and more recent big randomized studies in over 3500 procedures[23]. The rate of laparoscopic to open surgery conversion varies amongst research, ranging from 7 percent to 25 percent in large series and from 2 percent to 41 percent in short series, respectively. Despite the fact that conversion is not in and of itself an issue, it is linked to a higher rate of postoperative morbidity. BMI, excessive tumour size, adhesions, and surgical experience are among the 26 risk variables linked with conversion to open surgery that have been thoroughly reported in the literature. In this study, 6 patients received open surgery conversion. As stated in the literature, effective patient selection is critical, as is making the choice to convert sooner rather than later. The large proportion of individuals with stage III illness is an intriguing component of the research (65 percent). These patients recovered well after surgery and are being monitored for tumour recurrence and survival[24]. Following LAC, there is a lower risk of postoperative complications, notably respiratory issues, according to the literature. The resected segments had at least 5cm proximal and distal margins, and all margins were declared tumour clear on final histology. In this series, the average number of lymph nodes taken was 26, which is consistent with solid oncologic principles. These findings are in line with previous research[25].

CONCLUSION

Colonic surgeries with laparoscopic assistance are linked with a smaller incision, a faster resumption of bowel activity, less painkiller use, a shorter hospital stay, and low incidence of pulmonary infection. Laparoscopic colon surgery is a safe and successful procedure. It does, however, come with a high learning curve. In order to become proficient at advanced laparoscopic techniques with satisfactory results, it is only natural to apply this technique to colon disorders after developing trust in laparoscopic surgery.

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