

COMPARISON OF LAPAROSCOPIC VERSUS OPEN RIGHT HEMICOLECTOMY IN PATIENTS OF ASCENDING COLON TUMOR

MUHAMMAD MUNEEB SAQLAIN BAJWA¹, BILAL AFSAR², MUHAMMAD AYAZ³, AFSAR ALI BHATTI⁴

¹Consultant Surgeon, ²Postgraduate Resident, ³Senior Registrar, ⁴Professor

¹Department of Surgery, District Head Quarter Hospital, Narowal, ²Department of Surgery, Sheikh Zayed Hospital, Lahore,

³Department of Surgery, Lahore General Hospital, Lahore, ⁴Department of Surgery, Continental Medical College, Lahore

ABSTRACT

Background: Ascending colon and caecum can also develop cancer. Right hemicolectomy is the operation of choice for later two. Laparoscopic right hemicolectomy is reported to have advantages of minimal invasive surgery, but some contradictory results were found. So, the purpose of this study is the quest of truth.

Objectives: To compare the outcome of Laparoscopic and Open Right Hemicolectomy in patients of ascending colon tumors.

Methods: This randomized Controlled Trial was conducted at Surgical Unit II, Lahore General H, Lahore for 12 months from 2020-2021. Then 90 patients (45 in each group) were enrolled based on inclusion criteria. In group A, laparoscopic and in group B, open method was performed. Duration of surgery, hospital stay, wound complications and anastomotic leakage were noted. Data was recorded on proforma and analyzed in SPSS 25.0. Both groups were compared for duration of surgery and hospital stay by using independent samples t-test and for wound complication and anastomotic leakage by using chi-square test. P-value<0.05 was taken as significant.

Results: In laparoscopy mean duration of hospital stay was 6.47±1.24 days and in open surgery it was 7.96±1.35 days (p-value <0.05). In laparoscopy group, wound complication occurred in 4 (8.9%) patients and in open surgery group, wound complication occurred in 7 (15.6%) patients (p-value <0.05). In laparoscopy group no anastomotic leak occurred, but in open surgery group, anastomotic leak occurred in 3 (6.7%) patients (p-value <0.05). In laparoscopy group, pain was mild in 41 (91.1%) cases while moderate in 4 (8.9%) cases and no patients had severe or excruciating pain. In open surgery group, pain was mild in 32 (71.1%) cases while moderate in 10 (22.2%) cases and 3 (6.7%) patients had severe pain but no patient had excruciating pain. The difference was significant (p-value <0.05).

Conclusion: Laparoscopic method has advantages in terms of reduced hospital stay, less postoperative pain, wound complications and anastomotic leakage after surgery as compared to open surgical method.

Key words: Laparoscopic surgery, Open surgery, Right Hemicolectomy, ascending colon tumor, anastomotic leak, wound complication, stapling device.

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Correspondence to: *Afsar Ali Bhatti*,
Professor, Department of Surgery, Continental Medical
College, Lahore, Pakistan.

Email: afsarabhatti@gmail.com

INTRODUCTION

Appendix, caecum and ascending colon also develop carcinoma¹. Right hemicolectomy is the operation of choice for all of the latter two and some of the appendicular carcinomas. During a right hemicolectomy: cecum, ascending colon, hepatic flexure, the first third of the transverse colon, and terminal ileum are removed

along with its mesentery, blood and lymphatic supply close to their origin from superior mesenteric artery². Important etiological and risk factors include genetics, diet rich in fat, meat, & animal Protein, tobacco and alcohol intake.³ Stool occult blood, colonoscopy with biopsy, CT Scan with contrast and tumor markers (CEA mainly) are the mainstay of diagnosis. Because of its success Rate, it is the gold standard surgical treatment for malignant neoplasms of the right colon. Laparoscopic right hemicolectomy is reported to have advantages of minimal invasive surgery, but some contradictory results were found.¹ Therefore, we aimed to compare the outcome of laparoscopic and open right hemicolectomy in patients of ascending colon tumors.

METHODS

This RCT was, conducted in Lahore General Hospital, Lahore, Surgery Department from year 2018 to 2021 for a period four years. Sample size (n) of 90 patients were divided in two groups with 45 patients in each. Calculation was done with a confidence interval of 95%, power of study was 90%. Sampling technique was nonprobability, purposive sampling. Patients of age 30-70 years of either gender with biopsy proven diagnosis of ascending colon tumor were included. Patients with ASA status III and IV, tumors>6cm, tumours infiltrating the adjacent organs, intestinal obstruction or perforation, Duke’s D oncological stage, Familial Adenomatous Polyposis were excluded.

With the approval of Ethical Board, 90 patients based on above criteria were selected from surgical ward. Written informed consent was obtained and patient’s demographics i.e. recorded. Patients were divided by using randomization. In group A, laparoscopic Right Hemicolectomy was performed. In group B, open Right Hemicolectomy was performed. Both surgeries were done under general anesthesia. All surgeries were done by a consultant surgeon with assistance of researcher. All of the above parameters were recorded and calculated using SPSS 25.0.

RESULTS

The mean age of patients was 52.31±13.30 yrs in laparoscopic and 51.18±10.74 years in open surgery. In laparoscopy group, male:female ratio was 1:1 and in open surgery group it was 1:2. (Table 1). In laparoscopy mean duration of surgery was 125.18±19.66 minutes while in open group it was 134.20±25.07 minutes. (p-value <0.05). (Table 2). In laparoscopy mean duration of

hospital stay was 6.47±1.24 days and in open surgery it was 7.96±1.35 days (p-value <0.05). (Table 3) In laparoscopy group, wound complication occurred in 4 (8.9%) patients and in open surgery group, wound complication occurred in 7 (15.6%) patients (p-value <0.05). (Table 4). In laparoscopy group no anastomotic leak occurred but in open surgery group, anastomotic leak occurred in 3 (6.7%) patients (p-value <0.05). In laparoscopy group, pain was mild in 41 (91.1%) cases while moderate in 4 (8.9%) cases and no patients had severe or excruciating pain. In open surgery group, pain was mild in 32 (71.1%) cases while moderate in 10 (22.2%) cases and 3 (6.7%) patients had severe pain, but no patient had excruciating pain. The difference was significant (p-value <0.05).

Table 1: Age and duration of surgery in both groups (n=90)

Age (years)	Surgery duration	Group		p-value
		Laparoscopy	Open surgery	
30-50	n	19	20	0.381
	Mean	130.63	137.10	
	St Dev	19.55	25.48	
51-70	n	26	25	0.092
	Mean	121.19	131.88	
	St Dev	19.13	25.02	

Table 2: Type of tumour and duration of surgery in both groups (n=90)

Tumor	Surgery duration	Group		p-value
		Laparo-scopy	Open surgery	
Benign	n	14	15	0.648
	Mean	123.07	127.27	
	St Dev	22.91	25.84	
Malignant	n	31	30	0.041
	Mean	126.13	137.67	
	St Dev	18.34	24.37	

Table 3: Mean hospital stay in both groups (n=90)

Tumor	Hospital stay	Group		p-value
		Laparo-scopy	Open surgery	
Benign	n	14	15	0.156
	Mean	6.36	7.07	
	St Dev	1.34	1.28	
Malignant	n	31	30	0.000
	Mean	6.52	8.40	
	St Dev	1.21	1.16	

Table 4: Wound complications in both groups (n=90)

Tumor	Wound complication	Group		P-value
		Laparoscopy	Open surgery	
Benign	Yes	0 0.0%	5 33.3%	0.018
	No	14 100%	10 66.7%	
	Total	14 100	15 100%	
Malignant	Yes	4 12.9%	2 6.7%	0.414
	No	27 87.1%	28 93.3%	
	Total	31 100%	30 100%	

DISCUSSION

Laparoscopic techniques have been used to treat nearly all colonic disorders in the previous decade, including both benign and malignant tumours.^{4,5} When compared to the open technique, colorectal resection via laparoscopic method is regarded the gold standard method for both; benign and malignant colorectal tumours, with superior early and late outcomes.⁶ Less post-surgical discomfort, improved pulmonary function and a decreased stress response were noted as advantages of laparoscopy, which were especially significant in older patients who have a higher chance of post-surgical complications and death due to their diminished functional backup. In our trial, we observed that wound complication occurred in 4 (8.9%) patients after laparoscopy while in 7 (15.6%) patients after open surgery (p-value <0.05). In laparoscopy group, the mean age of patients was 52.31±13.30 years. Showing that older age group is more affected by colonic malignancy.¹ In open surgery group, the mean age of patients was 51.18±10.74 years. In laparoscopy group, there were 22 (48.9%) males while 23 (51.1%) females. A roughly equal distribution of cases among both sexes. In open surgery group, there were 15 (33.3%) males while 30 (66.7%) females. In laparoscopy group, the mean duration of surgery was 125.18±19.66 minutes. In open surgery group, the mean duration of surgery was 134.20±25.07 minutes. Table 02. It means that a little less time was taken in laparoscopic procedure. The laparoscopic procedures are progressively becoming faster. Average operative time was 165 min (50–140 min) in a previous study.³ A study reported reduced length of stay and short-term complication rates in the laparoscopic group when compared to open surgery (8 versus 10 days, and 36.7% versus 50.6% respectively) and another study reported equivalent 5-year survival between arms and a reduction of 2 days length of stay following laparoscopic surgery in older people.^{4,7} Mean hospital stay in our study

was 6.52±1.21 in laparoscopic surgery, while it was 8.40±1.16 in open surgery. In open surgery group, wound complication occurred in 7 (15.6%) patients. The difference was insignificant (p-value <0.05). All of these finding suggest a superior outcome of laparoscopic surgery as compared with open surgery in case of right hemicolectomy done for carcinoma of ascending colon. Also notable is the fact that majority of studies done in this regard have results in parallel with this research.^{4,5,8,9}

CONCLUSION

Laparoscopic method is far better in terms of lesser duration of procedure, less wound complications and anastomotic leak after surgery as compared to the open surgical method. Now we have resolved the controversy and found laparoscopic method as more feasible and successful with less complications for management of ascending colon tumors. Now in future, we will apply Laparoscopic Hemicolectomy in patients of colon tumours.

ETHICAL APPROVAL

The study was approved by the Institutional Review Board of Postgraduate Medical Institute / Ameer- ud-Din Medical College/ Lahore General hospital, Lahore, vide reference No. AMC/PGMI/LGH/SYN NO/0036-18 Dated September 20, 2018.

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AUTHOR'S CONTRIBUTIONS

MMSB: Manuscript writing, Data collection, Statistical analysis

BA: Proof reading

AI: Editing, Revision, Statistical analysis

AAB: Supervision of research