International Surgery Journal
El-Shakhs SE et al. Int Surg J. 2019 Apr;6(4):1035-1039
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20191064

Original Research Article

Comparative study between hand sewn and stapled anastomosis in laparoscopic right hemicolectomy

SolimanAbd-Elrahaman El-Shakhs[1], Ahmed Shokry Hafez[2], Mohamed Sabry Ammar[3], Moamen Mohamed Eltoukhy[4]*

[1]Department of General Surgery and Surgical Oncology, Faculty of Medicine Menoufia University, Shibin El-kom, Menoufia, Egypt
[2]Department Consultant of Surgical Oncology, El Salam Oncology Center, Cairo, Egypt
[3]Department of General and Laparoscopic Surgery, Faculty of Medicine Menoufia University, Shibin El-Kom, Menoufia, Egypt
[4]Department of General Surgery, Nile Hospital, Faculty of Medicine, Benha University, Benha, Egypt

Received: 19 February 2019
Accepted: 06 March 2019

***Correspondence:**
Dr. Moamen Mohamed Eltoukhy,
E-mail: Drmoamen2010@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Laparoscopic hemicolectomy for colonic cancer can be performed safely with morbidity, mortality and long-term results comparable to those of open surgery. Despite these advantages, laparoscopic right hemicolectomy is technically challenging and warrants intensive structured training to minimize conversion to open surgery and associated complications. Anastomosis could be done either by hand sewn or stapler.
Methods: Present study was a prospective study. It included 30 patients presented to Menoufia University Hospital and El Salam Oncology Center with carcinoma of right colon from March 2016 until September 2018. The patients were divided into two groups each group of 15 patients. In the first group, author used the hand sewing for anastomosis compared to the stapled anastomosis in the second group.
Results: In the first group, 11 of them were males (73.3%) and 4 were females (26.7 %) with the mean age was 55.93±8.64 years. In the second group, 6 of them were males (40%) and 9 were females (60%) with the mean age was 48.33±17.97 years. In the first group, the mean time of anastomosis was 36.0±4.71 minutes and in the second group the mean time of anastomosis was 21.67±5.56 minutes. In the first group, 1 case was complicated by leakage from anastomosis (6.2%), 1 case was complicated by wound infection (6.2%). In the second group, there was no complication.
Conclusions: In this study, the main advantages of doing a stapled anastomosis are the operative time, hospital stay and intraoperative bleeding. Postoperative complications than the hand sewn anastomosis.

Keywords: Cancer caecum, Hand sewn and stapled anastomosis, Laparoscopic right hemicolectomy

INTRODUCTION

Open right hemicolectomy is a procedure that involves removing the cecum, the ascending colon, the hepatic flexure, the first one-third of the transverse colon, and part of the terminal ileum, along with fat and lymph nodes. It is the standard surgical treatment for malignant neoplasms of the right colon.[1]

Laparoscopy has emerged as the preferred operative approach for most intra-abdominal pathologic conditions. Nonetheless, even though the first laparoscopic colectomy was reported more than 20 years ago.[2]

Laparoscopic hemicolectomy for colonic cancer can be performed safely with morbidity, mortality and long-term results comparable to those of open surgery.[3]

Laparoscopic procedure with a hand assisting with dissection and mobilization of the specimen to a laparoscopic assisted right hemicolectomy with laparoscopic dissection and mobilization of the specimen, resection of the specimen, or creation of the anastomosis.[4-5]

Here, author described the short-term results with laparoscopic-assisted hemicolectomy in which all portions of the resection and reconstruction were performed intracorporeally- dissection and mobilization of the bowel, ligation of the vessels, resection of the specimen and creation of the anastomosis. A small incision was used to remove the specimen.

The aim of the work was to compare technique and outcomes of hand sewn and stapled anastomosis in laparoscopic right hemicolectomy.

METHODS

This study was conducted on 30 presented to Menoufia University Hospital and El Salam Oncology Center with carcinoma of right colon from March 2016 until September 2018.

Inclusion criteria

Patients with right colon cancer indicated for laparoscopic right hemicolectomy with no contraindications to laparoscopy under general anesthesia.

Exclusion criteria

- Patient age >75 years old,
- Patient unfit for surgery.
- Patient who refuse laparoscopic surgery.

Procedure

All patients were subjected to clinical evaluation, history taking, personal history and present history, history of drug intake, past history including previous blood transfusion, medical diseases and history of surgical operations and general condition of the patients.

General examination for all body (head, neck, chest, abdomen and vitally) and local examination including PR and PV examination were taken.

Investigations

Laboratory investigations was done such as CBC, liver function, renal function, blood sugar and tumor markers. Radiological investigations such as CT abdomen with contrast, abdominal U\S and echocardiography.

RESULTS

This was a prospective study. It included 30 patients presented to Menoufia University Hospital and El Salam Oncology Center with carcinoma of right colon from March 2016 until March 2018. The patients were divided into two groups each group of 15 patients.

In the first group, anastomosis was done by hand sewing, 11 cases of them were males (73.3%) and 4 cases were females (26.7%) with the mean age incidence was 55.93±8.64 years, compared to stapled anastomosis in the second group, 6 cases of them were males (40%) and 9 cases were females (60%) with the mean age incidence was 48.33±17.97 years (Table 1).

Table 1: Comparison between the two studied groups according to demographics data.

Demographic data		Stapled (N=15)		Hand sewn (N=15)		Test of sig.	P
		No.	%	No.	%		
Gender	Male	6	40.0	11	73.3	x^2=3.394	0.065
	Female	9	60.0	4	26.7		
Age (Min-Max)		25.0-79.0		43.0-71.0		t=1.476	0.155
Mean±SD		48.33±17.97		55.93±8.64			
Median		45.0		55.0			

Table 2: Comparison between the two studied groups according to preoperative symptom.

Preoperative symptom	Stapled (N=15)		Hand sewn (N=15)		x^2	P
	No.	%	No.	%		
Weight loss	11	73.3	7	46.7	2.222	0.136
Anemia	10	66.7	9	60.0	0.144	0.705

In the first group, main presentations were weight loss 7 cases (46.7%), anemia 9 cases (60%). while in the second group, the cases were presented by weight loss 11 cases (73.3%), anemia 10 cases (66.7%) (Table 2). Colonoscopy was done in all cases while biopsies were taken and sent to histopathological and all results were

adenocarcinoma. In the first group, the microscopic picture was stage II in 5 cases (33.3%), stage III in 10 cases (66.7%). While in the second group, 7 cases were stage II (46.7%), 8 cases were stage III (53.3%). In the first group, macroscopic picture was large ulcer in 4 cases (26.7%), cauliflower in 9 cases (60%) and annular stricture in 2 cases (13.33%). While in the second group, macroscopic picture was large ulcer in 3 cases (20%), 10 cases cauliflower (66.7%) and annular stricture in 2 cases (13.33%) (Table 3).

Table 3: Comparison between the two studied groups according to preoperative workup.

Preoperative workup		Stapled (N=15)		Hand sewn (N=15)		x^2	p
		No.	%	No.	%		
Biopsy adenocarcinoma		15	100.0	15	100.0		
Staging of pathology	II	7	46.7	5	33.3	0.556	0.456
	III	8	53.3	10	66.7		
Colonoscopy	Large ulcer	3	20.0	4	26.76	-	-
	Cauliflower mass	10	66.7	9	60		
	Annular stricture	2	13.33	2	13.33		

Table 4: Comparison between the two studied groups according to cost and time of anastomosis.

Variables	Stapled (N=15)	Hand sewn (N=15)	Test of sig.	P
	3 Stapled	Sutures		
Cost	7500	<150		
Time of anastomosis (min)				
Mean±SD	21.67±5.56	36.0±4.71		
Median	20.0	35.0		

Table 5: Comparison between the two studied groups.

Postoperative management	Stapled (N=15)	Hand sewn (N=15)	U	p
Resuming oral intake (hours)				
Min-Max	12.0-48.0	72.0-96.0	t= 14.897*	<0.001*
Mean±SD	25.47± 9.61a	83.20± 11.53		
Median	24.0	84.0		
Hospital stay (day)				
Min-Max	2.0-10.0	5.0-9.0	39.0*	0.002*
Mean±SD	2.13± 4.47	1.30± 6.60		
Median	4.0	6.0		

In the first group, anastomosis was done by vicryl sutures while in the second group author used 3 staples in the anastomosis with high cost in the second group. In the first group, the mean of time of anastomosis 36.0±4.71 minutes and second group the mean of time of anastomosis 21.67±5.56 minutes (Table 4). In the first group, oral intake was resumed within 48 hours and within 24 hours in the second group. The hospital stay was 6 days in the first group and 4 days in the second group (Table 5).

In the first group, 1 case was complicated by leakage from the anastomotic site (6.2%) and 1 case was complicated by wound site infection (6.2%), while in the second group there was no postoperative complications (Table 6).

Table 6: Comparison between the two studied groups according to post-operative complication.

Post-operative complication	Stapled (N=15)		Hand sewn (N=15)		x^2	^{FE}p
	No.	%	No.	%		
Leakage	0	0.0	1	6.7	1.034	1.000
Infection	0	0	1	6.7	1.034	1.000
Obstruction	0	0.0	0	0.0	-	-
Stricture	0	0.0	0	0.0		

DISCUSSION

In this study, authors compared the results of hand sewing with the stapled anastomosis in laparoscopic resection of the right colon in thirty cases divided in to two groups each of them is 15 cases, the anastomosis was done by hand sewn in the first group and by stapled in the second group.

The ratio between males to females in the first group was (73.3%) to (26.7%) with the mean age incidence was 55.93±8.64 years. While in the second group the ratio was males (40%) to females (60%) with the mean age incidence was 48.33±17.97 years.

In the study by Jian-Cheng et al, evaluating the short-term outcomes in total laparoscopic right hemicolectomy with 3-step stapled intracorporeal isoperistaltic ileocolic anastomosis for colon cancer, the ratio was males to females (68.9% to 31.1%) from 29 cases in the hand sewn anastomosis while in stapled anastomosis the ratio between males to females was (57.1% to 42.9%) from 65 cases and the mean age was 68.0±8.3 years in agreement

with this study.[6] The main presenting symptoms in cancer colon are anemia and weight loss, the cases of the first group in this research presented by weight loss were 10 patients (66.7%) and anemia in 9 patients (60%), while in the second group the cases were presented by weight loss 9 cases (60%), anemia 9 cases (60%).

Phelan et al, studied the short and long-term outcomes of intracorporeal versus extracorporeal anastomosis in laparoscopic right hemicolectomy, the incidence of patients presented by anemia were (50.6%) while patients presented with weight loss were (49.4%) but in the study by Grams J et al, in the first group the cases presented with anemia were 30 patients (58.8%) and cases presented by weight loss were 43 patients (66.8%) in the second group the cases presented by anemia were 29 cases (45%) and the cases were presented by weight loss 39 patients (52%).[7,8] All patients in this study had CT abdomen with contrast, chest X-ray. The colonoscopy was done, and all cases had lesion then biopsy was taken and sent to histopathological study and all results were adenocarcinoma. The macroscopic picture in the first group was 4 cases with large ulcer (26.7%), 9 cases with cauliflower mass (60%) and 2 cases with annular stricture (13.33%), while in the second group the colonoscopy results was 3 cases with large ulcer (20%), 10 cases with cauliflower mass (66.7%) and 2 cases with annular stricture (13.33%).

In the study by Hellan et al, the stapled group included 21 cases with colonoscopy results was 6 cases had large ulcer (28.2%), 13 cases had cauliflower mass (61.9%), in the hand sewn group included 21 cases the colonoscopy results was large polypoid mass (4.8%), 13 cases neoplasm (71.4%) and annular stricture (23.8%) with average results between the two studies.[9] The microscopic pictures in the first group were adenocarcinoma stage II in (33.3%) and stage III (66.7%), while in the second group (46.7%) stage II and (53.3%) stage III in agreement with study of Jian-Cheng et al, who had 85 patients had undergone preoperative colonoscopy and the microscopic pictures in the first group were adenocarcinoma stage II in (41.4%) and stage III in (58.6%) of patients while in the second group the microscopic picture was (35.7%) stage II and (64.3%) stage III.[6] According to intraoperative management in the first group, the mean time of anastomosis was 36.0±4.71 minutes and in the second group the mean time of anastomosis was 21.67±5.56 minutes, in agreement with the study of Thakor et al, where the time of anastomosis in the first group (34 cases by stapled anastomosis) 19.61 mins and in the second group (34 cases by hand sewn anastomosis) 35.87 mins and in another study by Bhandary et al, the stapled group time of anastomosis 18.06±0.18min and hand sewn group time of anastomosis 25.59±0.24 min.[9,11] Anastomosis in the first group was done with vicryl sutures while in the second group author used 3 staples in the anastomosis with high cost in the second group in agreement with Kosuge et al, who used 3 staples in 292 cases and used vicryl suture in hand sewn in a second group of 392 of patients.[12]

In another study by Hellan et al, they used 3 staples in 292 cases while in the hand sewn group they used vicryl sutures in 392 cases with high cost in the stapled group.[9]

In this study, the intra operative blood loss in the first group was around 100±20 cc while in the second group it was around 20±15 cc in agreement with Kosuge M et al, and Bhandary et al.[11,12]

In this research, patients resumed oral intake in the first group in 25.47±9.61 hours while in the second group was 83.20±11.53 hours in agreement with study of Phelan et al, who had mean resuming oral intake was 30±9 hours in the stapled group and in 60±11 hours in the hand sewn group. But in the study of Jian-Cheng et al, who had mean resuming oral intake of 27±7 hours in the stapled group while the meantime of resuming the oral intake in the hand sewn group was 54±9 hours.[6,7] The mean hospital stay in the first group in this study was 4.47±2.13 days and in the second group the mean hospital stay was 6.60±1.30 days in agreement with the study of Phelan MJ et al, where the hospital stay after the operation in the stapled group was 3±2 days and in the hand sewn group the mean was 6±1 days.[7] But in disagreement with Jian-Cheng et al, who had the mean hospital stay after operation in the first group 10±2 days and in the second group the mean was 12±1 day.[6]

In the study by Thakor et al, hospital stay in the stapled group (34 cases) was 11.59 days and in the hand sewn group (34 cases) it was 12.69 days.[9]

In the first group of this study, there was 1 case complicated by leakage from anastomosis (6.2%) which was presented by abdominal pain, tenderness, vomiting and the drain collected serosanguineous fluid about 100 cc and was managed by pelvi-abdominal ultrasound, where minimal to moderate fluid collection was detected and treated conservatively by NPO, antibiotic, TPN and observation of the drain.

Another case in the first group was complicated by wound infection (6.2%) presented by redness and discharge from the wound site which was managed by culture and sensitivity and received the appropriate antibiotic and repeated dressing changes. There were no post-operative complications in the second group.

In the study by Feroci et al, in the stapled group (442 cases) there was 7 cases complicated with leakage (1.7%), 5 cases treated conservatively, and 2 cases treated surgically. While in the hand sewn group (621 cases) there was 43 cases complicated with leakage (7.5%), 29 cases treated conservatively, and 14 cases treated surgically.[13] The complication rate is higher than this study due to the much increase in the number of cases of the later study.

In the study by Jian-Cheng et al, in the stapled group (51) cases there was 1 case complicated with skin infection. While in the hand sewn group (29), cases there was 1 case complicated with obstruction, 1 case with stricture, 4 cases with wound infection, and 3 cases complicated by leakage (10%). The complication rate is lower than that of the other study in the form of wound site infection, which is due to the good pull up bowel during the anastomosis, and in leakage due the meticulous anastomosis technique.[6]

In the study by Bhandary et al, in the stapled group 35 cases with no leakage and in the hand sewn group 35 cases there was 1 case complicated by leakage and was managed conservatively with excellent match in both studies.[11]

CONCLUSION

Author's experience in this study showed the main advantages of doing a stapled anastomosis are the operative time, hospital stay and intraoperative bleeding. Postoperative complications than the hand sewn anastomosis. Laparoscopic right hemicolectomy with 3-step stapled intra corporeal anastomosis for cancer caecum to be a safe, reliable and convenient procedure that offers benefits of short anastomosis time, less surgical trauma, flexibility in the selection of specimen extraction site, less postoperative pain and earlier bowel recovery.

Author believed that this technique should be considered by every laparoscopic surgeon is faster and less morbidity than hand-sewn anastomosis.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Wolff BG, Larson DW. Right hemicolectomy for treatment of cancer: open technique. Fischer JE, eds. Mastery of Surgery. 5th ed. Lippincott, Williams and Wilkins; 2006: 138.
2. Cirocchi R, Trastulli S, Farinella E, Guarino S, Desiderio J, et al. Intracorporeal versus extracorporeal anastomosis during laparoscopic right hemicolectomy—systematic review and meta-analysis. Surg Oncol. 2013;22:1–3.
3. Damesha N, Lubana PS, Jain DK, Mathur R. A comparative study of sutured and stapled anastomosis in gastrointestinal operations. Internet J Surg. 2008;15(2).
4. Lee KH, Ho J, Akmal Y, Nelson R, Pigazzi A. Short-and long-term outcomes of intracorporeal versus extracorporeal ileocolic anastomosis in laparoscopic right hemicolectomy for colon cancer. Surg Endosc. 2013;27(6):1986-90.
5. Neutzling CB, Lustosa SA, Proenca IM, Silva EM, Matos D. Stapled versus handsewn methods for colorectal anastomosis surgery. Cochrane Database Syst Rev. 2012;(2):CD003144
6. Jian-Cheng T, Shu-Sheng W, Bo Z, Jian F, Liang Z. Total laparoscopic right hemicolectomy with 3-step stapled intracorporeal isoperistaltic ileocolic anastomosis for colon cancer: An evaluation of short-term outcomes. Med. 2016;95(48):5538.
7. Hanna MH, Hwang GS, Phelan MJ, Bui TL, Carmichael JC, Mills SD, et al. Laparoscopic right hemicolectomy: short-and long-term outcomes of intracorporeal versus extracorporeal anastomosis. Surg Endosc. 2016;30(9):3933-42.
8. Grams J, Tong W, Greenstein AJ, Salky B. Comparison of intracorporeal versus extracorporeal anastomosis in laparoscopic assisted hemi-colectomy. Surg Endosc. 2010;24(8):1886-91.
9. Thakor RB, Kansal SS, Salecha PA. A comparative study of Hand suture verses Stapler anastomosis Gastrointestinal surgeries. National J Med Res. 2014;l4(4):354-6.
10. Hellan M, Anderson C, Pigazzi A. Extracorporeal versus intracorporeal anastomosis for laparoscopic right hemicolectomy. JSLS. 2009;13(3):312.
11. Bhandary S, Babu NM, Gojanur G. Comparative study of bowel anastomosis–Hand sewn versus stapler. IOSR J Dental Med Sci. 2016;15(12):37-42.
12. Kosuge M, Eto K, Hashizume R, Takeda M, Tomori K, Neki K, et al. Which is the safer anastomotic method for colon surgery? ten-year results in vivo. 2017;31(4):683-7.
13. Feroci F, Lenzi E, Garzi A, Vannucchi A, Cantafio S, Scatizzi M. Intracorporeal versus extracorporeal anastomosis after laparoscopic right hemicolectomy for cancer: a systematic review and meta-analysis. Inter J Colorectal Dis. 2013;28(9):1177-86.

Cite this article as: El-Shakhs SE, Hafez AS, Ammar MS, Eltoukhy MM. Comparative study between hand sewn and stapled anastomosis in laparoscopic right hemicolectomy. Int Surg J 2019;6:1035-9.