ejpmr, 2021, 8(5), 517-521

SJIF Impact Factor 6.222

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 2394-3211

EJPMR

COMPARATIVE ANALYSIS OF 3D HD AND 2D HD LAPAROSCOPIC HEMICOLECTOMY OF RIGHT COLON CARCINOMA

Shantanu Baral, Mubeen Hussein Arawker, Feng Wang, Jiajie Zhou, Dongliang Li, Zaman Ashraful Haque Swapnil and Daorong Wang*

Northern Jiangsu People's Hospital (Subei), Affiliated Hospital of Yangzhou University, Yangzhou, Jiangsu, China.

***Corresponding Author: Daorong Wang**

Northern Jiangsu People's Hospital (Subei), Affiliated Hospital of Yangzhou University, Yangzhou, Jiangsu, China.

Article Received on 04/03/2021 **Article Revised on 25/03/2021** **Article Accepted on 14/04/2021**

ABSTRACT

Objective: Exploring the benefits of 3D absolute laparoscopic hemicolectomy with complete mesocolic excision right colon carcinoma (CME). **Methods:** This research included a total of 200 cases of right colon carcinoma. Randomly, the patients were split into 2D group (n = 120) and 3D group (n = 80), both of which got the right colon carcinoma laparoscopic hemicolectomy with CME. Statistical research was conducted using Windows' SPSS 23.0. Continuous variable mean values were determined. Unpaired or pupil t-test for constant variables. Categorical interpretations were made using Chi-square. On all statistical analyses, P-value below 0.05 was found statistically important. **Results:** There were no significant difference in gender, age, body mass index (BMI), and distant metastasis between the two groups (P>0.05). The average operation time of the two groups were 152.3±37.7 (min) and 126.7±24.3 (min), with significant difference (P = 0.001); the intraoperative blood loss of the two groups were 91.3±100.7 (ML) and 48.5±23.6 (ML), with significant difference (P = 0.001). The postoperative complications in the two groups were 3.3% and 2.5%, respectively. The incidence of postoperative complications in gastrojejunostomy group was no significantly between the two groups (P = 0.544). **Conclusion:** Laparoscopic 3D method gives a concise overview, lowers the time of surgery and blood loss in right-colon carcinoma laparoscopic hemicolectomy with CME.

KEYWORDS: complete mesocolic excision; right colon carcinoma; 3D laparoscopy; 2D laparoscopy.

INTRODUCTION

Colorectal carcinoma (CRC) is the most common malignancy of the gastrointestinal tract and is the third most deadly and fourth most commonly diagnosed cancer in the world.[1] Colonic resection is the only curative option available for patients with colon cancer, affecting both men and women, with a more likelihood in men than in women. The incidence of CRC was more than 1 million per year and about 500,000 deaths per year.[2] In fact, more than 40% of all the CRC occurs in the right hemi-colon.[3] Due to the critical infection and death rates associated with colorectal carcinoma, numerous advanced preventive and clinical treatment measures have been implemented to counter its prevalence and severity among individuals.

Colon cancer is one of the widespread digestive tract malignant tumors which grows year after year. Surgical resection is the first option for right colon cancer clinical care. The conventional laparotomy was eventually substituted by laparoscopic surgery because of its benefits, such as good cure, reduced trauma and rapid rehabilitation.[4,5] The laparoscopes currently used in clinical use include 2D laparoscopic and 3D laparoscopic devices. 2D laparoscopic surgery is well known and popularized for its minimal incision and faster healing following surgery. In the field of colorectal surgery. The conventional 2D laparoscopy method can thus have only two-dimensional spatial representations and lack a profound vision. The development of 3D laparoscopy will boost 2D laparoscopy deficiencies, provide the surgeon with a more functional 3D and visual surgical area, and can have advantages in reducing operational time and intraoperative blood loss.[6,7] This article analyzes the clinical data including 80 patients in 3D laparoscopy group and 120 patients in 2D laparoscopy group. The general clinical data, intraoperative and postoperative data and complications of the two groups were collected and analyzed, and the advantages and disadvantages of the two surgical methods were compared, so as to provide reference for the treatment of patients with advanced unresectable colon cancer in the future.

MATERIALS AND METHODS

Clinical data: The patients were included in this study, All of them were diagnosed carcinoma at the Cecum, Ascending colon, Hepatic flexure who had been diagnosed by colonscope and pathology before surgery. Patients were included in this study. Both were chosen

for surgery with laparoscopic resection (2D and 3D) and anastomosis. Both clinical data come from the patient management system (Gastrointestinal Division, Department of General Surgery, Northern Jiangsu people hospital). The inclusion criteria were: ① 18–80 years of age at diagnosis.② body mass index (BMI) between 18.5 to 30 kg/m2 . ③ pathological diagnosis of Cecum ,Ascending colon ,Hepatic flexure carcinoma by colonoscopy.④ no distant metastasis determined by chest and abdominal computer tomography(CT). The exclusion criteria included: ① multiple colorectal primary carcinomas.② uncontrolled diabetes mellitus, immune system diseases or hematological diseases. ③ severe intestinal obstruction. The medical ethics committee of our hospital approved this research and the patients and their families were informed of their approval.

Operation method: The caudal approach to radical resection of right colon cancer was included in the observation community. Following anesthesia, the patient was placed in a herringbone pose. The surgeon took a position on the patient's left foot, the first assistant on the right, and the mirror in his lap. The space between the knees. Make a 12 mm incision 3.5 cm below the costal edge of the left midclavicle as the main operative hole, puncture 12 mm Tmcar, insert a laparoscope to observe the larvae, establish a pneumoperitoneum, and make a 12 mm incision 1.2 cm longitudinally under the umbilicus, puncture 12 mm Tmcar, insert a laparoscope to observe the larvae, establish a pneumoperitoneum The auxiliary operation hole is a 5 mm incision on the left anti-point, Mic's and the assistant operation hole is symmetrical on the left side, with the pneumoperitoneum pressure held at 13-14 mmHg. To assess the lesion and the depth of surgery, regularly explore the abdominal cavity, liver and gallbladder, intestines, and abdominal wall. Place the patient with their head down and their feet about 30 inches high. Tilt to the left to expose the mesenteric bridge at the yellow-white intersection of the narrow mesentery and the posterior peritoneum, as well as the contents of the abdominal cavity moving to the left upper abdomen. The membranous bridge is cut about 2 cm above the right iliac blood vessel to enter the Toldt space and expand, the right side to the ascending sulcus mesangium, the left side to the left side of the superior mesenteric vein, up to the head of the pancreas and the upper part of the descending part of the duodenum, protect the right ureter and gonadal vessels, and separate surfactant, penetrate the narrow omental sac, locate and divide the colon and mesenteric space, and turn the operation scene to the upper part of the transverse colon. Continue to sever the hepaticocolonic ligament, the lateral ascending colon ligament, the naked transverse colon, and the right hemicolon and mesangial dissociation until the right hemicolon and mesangial dissociation is complete. Remove the free intestinal tube, remove the intestinal tumor within a predetermined range, and conduct the ileum and transverse colon with a linear cutting closure system. Make a 5 cm incision in the center of the upper abdomen, secure the surgical incision, pay attention to the concept of no tumor, remove the free intestinal tube, remove the intestinal tumor within a predetermined range, and perform the ileum and transverse colon with a linear cutting closure device The anastomosed bowel tube was inserted in the right upper abdomen, the mesenteric hiatus was removed, and the arch I flow tube was placed in the right liver and kidney crypt and fixed outside the abdominal wall. The patients in the monitoring group were in the same place as those in the observation group, as was the surgeon. To join the Toldt space and extend, the mesentery was cut under the projection of the ileocolonic artery. The ascending colon, the hepatic flexure of the colon, and the transverse colon is removed from the tail via the right colon posterior space after the mesentery was raised. Clean up the associated lymph nodes and dissect the normal trunk of the colonic, gastric, and colonic blood vessels around the mesenteric upper static (arterial) vein laterally and cranially. The gastrocolonic and hepatocolonic ligaments are sliced and opened up to the ileocecal region and fused from the direction of the colon's liver curve. The solution in the east. Break the free intestinal portion and excise the right colon, conduct an anastomosis of the transverse colon and ileum, return the intestine into the abdominal cavity, and eventually seal it. Right paracolic groove incision and indwelling rubber tube drainage Other lymph nodes were dissected to the same extent as those in the observation community, and the length of the intestinal tube resected was the same.

Evaluation index: The clinical characteristics, including age, gender, BMI, tumor location, American Society of Anesthesiologists score, previous abdominal operation history, and preoperative chemotherapy, were analyzed. The collected surgical outcomes included the operative time, the blood loss anastomosis time and, the removal method of the specimen. Two pathologists reviewed the resected specimens, and the proximal resection margins, distal resection margins, number of harvested lymph nodes, and pathological TNM stages (eighth edition) were recorded. The factors associated with postoperative recovery include the average time to ground activities, first flatus, first defecations, postoperative hospitalization and postoperative hospitalization, analog scale scores on postoperative days 1, 3 and, 5 (POD1, POD3, POD5), were compared. The short-term postoperative complications, such as anastomotic bleeding, anastomotic stenosis, anastomotic leakage, abdominal infection, pulmonary infection, incision infection and bowel obstruction, were recorded.

Statistical methods: Statistical analysis was carried out by using the Statistical Package for Social Sciences version 23.0 for Windows (SPSS Inc., Chicago, Illinois, USA). The mean values were calculated for continuous variables. Frequencies and percentages indicated the quantitative observations. Unpaired or student t-test was used for continuous variables. Categorical comparisons

were performed using the Chi-square test. For all statistical tests, P –value less than 0.05 was considered statistically significant.

RESULTS

1. General data analysis

Of the 200 patients included in the study, 120 patients operated by 2D laparoscopy (2D group) and 80 operated by 3D laparoscopy (3D group). The general data were as follows: the average age of 2D group was 64.6±10.6 (years old) and that of 3D group was 62.1±11.4 (years old), there was no significant difference between the two groups (P = 0.110); the average BMI of 2D group was 24.0±2.8 (kg/m^2) and that of 3D group was 24.4±3.3 (kg/m^2), there was no significant difference between the two groups (P = 0.358);there were 78 males and 42 females in 2D group, 55 males and 25 females in 3D group, and there was no significant difference in gender composition between the two groups (P = 0.582); there were 13 patients and 3 patients in the two groups with distant metastasis (P = 0.070), In conclusion, there was no significant difference in gender, age, body mass index (BMI), and distant metastasis between the two groups (P > 0.05). The specific results are shown in Table 1.

Table 1: General data analysis (n=200).

General data analysis	2D group (n=120)		3D group (n=80)		X2/ T value	P-value
	n	%	n	%		
Age (years)	64.6	±10.6	62.1	±11.4	2.59	0.110
BMI (kg/m^2)	24.0	±2.8	24.4	±3.3	0.92	0.358
Gender						
Male	78	65.0	55	68.8	0.30	0.582
Female	42	35.0	25	31.3		
Metastasis						
Yes	13	10.8	3	3.8	3.27	0.070
No	107	89.2	77	96.3		

2. Intraoperative and postoperative data analysis

Intraoperative conditions: the average operation time of the two groups were 152.3±37.7 (min) and 126.7±24.3 (min), with significant difference (P = 0.001); the intraoperative blood loss of the two groups were 91.3±100.7 (ML) and 48.5±23.6 (ML), with significant difference (P = 0.001). Postoperative recovery: the anal defecation recovery time of the two groups were 4.9±1.6 (d), 4.5±1.4 (d), no significant difference (P = 0.070), the recovery time of eating food of the two groups were 6.4±2.2 (d), 5.7±1.2 (d), a significant difference (P = 0.010).The postoperative hospital stay was 12.6±4.4 (d) and 10.5±2.0 (P = 0.001). Operation time, blood loss, recovery time, and postoperative hospital stay significant difference between the two groups. The specific results are shown in Table2.

Table 2: Intraoperative and post operative finding data analysis (n=200).

Intraoperative and post operative finding	2D group (n=120)		3D group (n=80)		T value	P value
	Mean	±SD	Mean	±SD		
Operation time (min)	152.3	±37.7	126.7	±24.3	5.37	0.001
Intraoperative blood loss (ml)	91.3	±100.7	48.5	±23.6	3.73	0.001
Anal defecation recovery time (d)	4.9	±1.6	4.5	±1.4	1.82	0.070
Recovery time (d)	6.4	±2.2	5.7	±1.2	2.60	0.010
Post operative hospital stay (d)	12.6	±4.4	10.5	±2.0	4.00	0.001

3. Pathological index data analysis

Pathological index: 30 was T4 in the 2D group and 29 in the 3D group, and there was a significant difference in T stage composition between the two groups (P = 0.009); the average positive lymph nodes of the two groups were 1.6±3.27 and 0.9±1.7, with no significant difference (P = 0.074); the EXAMINED lymph nodes of the two groups were 15.0±9.0 and 13.3±8.4, with no significant difference (P = 0.181). T stage significant difference between the two groups. The specific results are shown in Table 3.

Table 3: Pathological index data analysis (n=200).

Pathological index	2D group (n=120)		3D group (n=80)		Chi value/ T value	P value
	n	%	n	%		
T stage						
T0	3	2.5	1	1.3		
T1	2	1.7	8	10.0		
T2	24	20.0	7	8.8		
T3	36	30.0	25	31.3	18.85	0.009
T4	30	25.0	29	36.3		
T4a	20	16.7	9	11.3		
T4b	5	4.2	0	0.0		
Tis	0	0.0	1	1.3		
Positive lymph nodes	1.6	±3.2	0.9	±1.7	1.79	0.074
EXAMIED lymph nodes	15.0	±9.0	13.3	±8.4	1.34	0.181

4. Comparative analysis of postoperative complications

Regarding postoperative complications, only 1 case (0.8%) of anastomotic leakage occurred in the 2D group, and the difference was not statistically significant (P = 0.600); in the two groups; 3 cases (2.53%) of bowel obstruction in the 2D group and 2 cases (2.5%) in the 3d group, and the difference was not statistically significant (P = 0.684); in general, the incidence of postoperative complications in the two groups were 3.3% and 2.5%, respectively. The incidence of postoperative complications in the gastrojejunostomy group was no significant between the two groups (P = 0.544). The detailed results are shown in Table 4.

Table 4: Postoperative complications (n=200).

Postoperative complications	2D group (n=120)		3D group (n=80)		Chi value	P value
	n	%	n	%		
Anastomosis leakage	1	0.8	0	0.0	0.67	0.600
Bowel obstruction	3	2.5	2	2.5	0.00	0.684
Total complication	4	3.3	2	2.5	0.11	0.544

DISCUSSION

The 2D laparoscopic device has a flat image which requires the surgeon, particularly when performing difficult operational tasks, to transform the flat picture into a stereoscopic image that lacks depth and spatial perception which will present considerable challenges for the surgeon; The laparoscopic method gives the surgeon a stereoscopic picture, eliminating the steps to transform the plane image into a stereoscopic picture. Studies also shown that younger residents think 3D laparoscopic surgery is better than 2D in laparoscopic preparation because it will shorten the curve of learning. In the Author's review, all surgery was done in laparoscopic surgery by an accomplished senior surgeon. Laparoscopic surgeons experienced do not often require a 3D setup so they may use shadows or shifting parallax to deepen vision instead of stereo vision. However, 3D laparoscopic systems can allow surgeons to distinguish anatomic and vascular structures and improve their sense of depth, compared with 2D laparoscopic systems. In case of accidental bleeding, the surgeon cannot efficiently avoid bleeding during the surgery, but can quickly detect the bleed point and control bleeding with less bleeding.[8] This helps to minimize the occurrence of accidents; the laparoscopic 3D system can have a clearer look, a good depth perception and a correct hand-eye coordina compared with the 2D system (such as laparoscopic suture). Reduce suture corrective behavior, set suture angle, tissue edge, needle orientation, and suture if the needle is more precise and easy. Senior laparoscopic surgeons will also benefit from 3D laparoscopic imaging, reduce operating time.[9] and rehabilitation for patients by improving visual clarity. The 3D laparoscopic device is nearer to the realm, allowing beginners to understand the technology more quickly within a limited timeframe, and will effectively minimize the learning curve, and promotes laparoscopic technology and makes it more clinical. As soon as possible, physicians can learn laparoscopic techniques.[10] While advanced surgeons are more familiar with two-dimensional vision, compared with conventional 2D laparoscopic imaging, 3D laparoscopic imagery can have a stronger 3D vision range, enhance three-dimensional and depth of surgery that the surgeon can use. The laparoscopic 3D device will improve sense of depth to make activity easier. The new, 3D laparoscopic system is not such a disorder for the surgeon in comparison to the 1st-generation one-lens imaging equipment, such as dizziness, headaches and other discomforts, related to the advancement of the surgical imaging system.[11] This research used a retrospective study, there were no future trials, just comparisons were done with surgical markers, and there was no long-term follow-up data. Although the two

groups do not have general knowledge and common baseline features, sampling distortions can also be present, and smaller sample sizes may need larger sample sizes to be distinguished.

CONCLUSION

This study concluded that colon cancer using 3D laparoscopic systems appears to be beneficial, with less operative time, intraoperative blood loss, recovery time, less hospital stay, and fewer postoperative complications than 2D laparoscopic systems.The 3D laparoscopy system is also beneficial to experienced surgeons. However, further experiments with large populations, particularly future randomized controlled trials, are also required to assess whether 3D laparoscopy is more favorable.

REFERENCES

1. Bray, F., et al., *Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries.* CA Cancer J Clin, 2018; 68(6): 394-424.
2. Siegel, R.L., et al., *Colorectal cancer statistics, 2017.* CA Cancer J Clin, 2017; 67(3): 177-193.
3. Ji, F., X. Fang, and B. Fei, *[Comparative study of 3D and 2D laparoscopic surgery for gastrointestinal tumors]*. Zhonghua Wei Chang Wai Ke Za Zhi, 2017; 20(5): 509-513.
4. 李毅, 庄., *完整结肠系膜切除对结肠癌手术患者的疗效.* 安徽医学, 2017; 38(7): 889 - 891.
5. 王锡山, *3D 腹腔镜技术在微创外科的现状与思考.* 中华结直肠疾病电子杂志, 2014; 3(3): 177-179.
6. 郑民华, *以质量为本发展我国的胃肠微创外科.* 中华胃肠外科杂志, 2013; 16(10): 911-914.
7. 曾兵, 蔡., 辛海洋,等., *3D腹腔镜在右半结肠癌全结肠系膜切除术中的应用.* 岭南现代临床外科, 2017; 17(1): 30-33.
8. Tao, K., et al., *Three-Dimensional Against 2-Dimensional Laparoscopic Colectomy for Right-sided Colon Cancer.* Surg Laparosc Endosc Percutan Tech, 2016; 26(4): 324-7.
9. Curro, G., et al., *Three-Dimensional Versus Two-Dimensional Laparoscopic Right Hemicolectomy.* J Laparoendosc Adv Surg Tech A, 2016; 26(3): 213-7.
10. Cologne, K.G., et al., *Three-dimensional Laparoscopy: Does Improved Visualization Decrease the Learning Curve Among Trainees in Advanced Procedures?* Surg Laparosc Endosc Percutan Tech, 2015; 25(4): 321-3.
11. Sahu, D., M.J. Mathew, and P.K. Reddy, *3D Laparoscopy - Help or Hype; Initial Experience of A Tertiary Health Centre.* J Clin Diagn Res, 2014; 8(7): NC01-3.