

Laparoscopic Surgical Management of Rectal Cancer

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Abstract:

Colorectal cancer is the malignance which initiate in the rectum or colon and considered as the fourth most frequently identified tumor and the second foremost cause of cancer demises in male and female combined throughout the world. Standardly, the risks of lifetime colon cancer development are approximately 1/23 for male and female collectively but it varies broadly with respect to certain risk factors. The objective of this study was to evaluate the consequent outcomes in the patients with rectal cancer endured laparoscopic surgical excision at Department of Surgery, Liaquat University of Medical and Health Sciences Jamshoro, Hyderabad and to review their curative resection and recurrence rates, postoperative morbidities and complete survival. 40 patients of 30-65 years ages with rectal cancer underwent a diagnostic laparoscopy at the Department of Surgery and gynecology of Liaquat University of Medical & Health Sciences, Jamshoro, Sindh, Pakistan. After completely removed the tumor, the specimen pinned out on a flat surface and placed in fixative solution to allow orientation of the specimen and an accurate assessment of the margins. As the specimen had acceptable clear margins and limited invasions to the submucosa, no further surgical procedure was proceeded. Patients in the laparoscopic operation lost less blood with an amount of only 200mL during 250 minutes average operation time. The bowel functioning returned in 2 days averagely with 8 days average hospital stay. The comparative studies confirmed that laparoscopic surgery for rectal cancer is more advantages than open surgery and a safe and feasible approach in terms of the less post-operative complications and recovery time as well as hospital stay duration.

Key Words: Rectal Cancer, laparoscopic surgery

Introduction:

Colorectal cancer is the malignance which initiate in the rectum or colon and considered as the fourth most frequently identified tumor according to GLOBOCAN as well as the second foremost cause of cancer demises in male and female combined throughout the world. It is also referred as rectal adenocarcinoma that generally emerges from the large intestinal epithelial and glandular cells (1). When particular epithelium cells attain a series of epigenetic or genetic mutations, it leads to confer the cancer consequently. In addition, the abnormally sensitive survival and replication, such hyper-proliferative cells emerge to benign adenoma that often develop into metastasize and carcinoma. Standardly, the risks of lifetime colon cancer development are approximately 1/23 for male and female collectively but it varies broadly with respect to certain risk factors (2).

In 2018, around 1,096,000 new colon cancer diagnosed cases have been reported along with 704,000 cases of rectal cancer and comprise 1.8 million cases collectively. Rectal cancer is the most diagnostic cancer amongst males in 10/191 countries throughout the world but among females no country reported it as the most diagnosed malignance (3). The incidence of rectal cancer is more in males as compared to females and 3 to 4 folds more frequent in developed as compared to developing countries. In the Southern and Northern Europe, New Zealand, North America, Australia and Eastern Asia are the regions of higher incidences of colorectal cancer. The Hungary with 70.6% among males and Norway with 29.3% among females per 100,00 population are the countries with the highest incidence of rectal cancer (4).

The minimally invasive methods were primarily familiarized for the treatment of internal disorders of abdominal cavity in the late 1980s principally gallstone disorders. The rapid developmental indications could be observed for laparoscopic surgery within last decade. The few surgeons of the Canada, United States, Europe and Australia started to operate the patients with the bodily cancer inside the abdomen early after the development of such advanced

procedure particularly colorectal cancer (5). Meanwhile, there are still several solid reservations concerning with laparoscopic-supported colectomy among the global surgical societies with queries about the benefits of the laparoscopic approaches and an emphasis on worries regarding insufficient oncologic resection putting patients at risks of emerging premature reappearances (6).

Material and Methods:

40 patients of 30-65 years ages with rectal cancer underwent a diagnostic laparoscopy at the Department of Surgery and gynecology of Liaquat University of Medical & Health Sciences, Jamshoro, Sindh, Pakistan. The sequence of clinical investigations was made for initial diagnostics of rectal cancer. The particularizes of operational process, procedural time and stay duration in the hospital were noted and under general anesthesia, operations were completed. The patient was put in the adapted Lloyd-Davies position and the sigmoid as well as left colon were mobilized (7). The lesions of the middle and upper rectum were managed through an anterior resection.

The inferior mesenteric artery (IMA) was divided into distal or proximal for taking off the left colic artery. The division site was dependent upon the location of lesion along with bowel proportion required for a safe anastomosis. In the avascular planes, the posterior rectum was mobilized using sharp dissection between the prostate or vagina and rectum immediately posterior to the IMA. At the sidewall of pelvic, the lateral dissection was made on the lateral rectal vessel's division and dissection continued to 4 cm below the tumor (8). It is considered significant to resist dissection near to the tumor during proceeds towards the pelvis also called coning. After accomplishing the rectal mobilization, a determination was made to evaluate that any passable distal margin existed between the tumor and levators.

The lesions of the lower rectum were managed with an abdominoperineal resection (APR) and transanal and coloanal excision. The lesions were evaluated with intrarectal ultrasound which exhibits them as mobile, small sized of 3 cm diameter, and closed to 6 cm from the verge of anus. In this method, the 1:100,000 diluted epinephrine solution infiltrated into the submucosal space to present the accurate surgical dissection plane and haemostasis maintenance. Using electrocautery, the lesions were excised by taking much care to keep intact the surrounding tissues and lesions throughout the excision (9).

After completely removed the tumor, the specimen pinned out on a flat surface and placed in fixative solution to allow orientation of the specimen and an accurate assessment of the margins. As the specimen had acceptable clear margins and limited invasions to the submucosa, no further surgical procedure was proceeded.

Results and Discussion:

The study was undertaken between May 15, 2019, and Oct 20, 2019. 40 patients were assigned to the laparoscopic surgery and analyzed. Patients in the laparoscopic operation lost less blood with an amount of only 200mL averagely. However, operations took 250 minutes on average and functioning of bowel returned as soon on 2 days averagely with shorter hospital stay of 8 days averagely. The completeness of the resection was positive macroscopically with circumferential margin of resection about less than 2 mm was reported. The tumor distance in the margin of distal resection was approximate 5 cm. Anesthesiologic risks and rectum tumor location were assessed by the classification of American Society of Anesthesiologists which exhibited zero percent probabilities on the average (10). The additional postoperative and intraoperative data disclosed significant benefits in favor of the laparoscopy as compared to open surgery with respect to several aspects including intraoperative transfusions incidents, necessity for postoperative stay in intensive care unit (ICU), and rate of typical and general invasive complications like postoperative ileus, wound infections and bleeding (11).

According to different scientific views and pathologic studies, in the absence of a very poorly or largely differentiated tumor, the maximal reported microscopic tumor extension in the distal bowel wall is 5 mm (12). Clinical studies have demonstrated equivalent results with any distal margin greater than 1 cm. Therefore, a margin greater than 2 cm appears to be adequate. For selected lesions, transanal excision is an option (13). Laparoscopic surgery remains the better treatment for rectal cancer. Good results depend on preoperative preparation, performing an appropriate and safe operation, and postoperative care. The choice of this operation is based on the anatomic location of the lesion (14). Important operative oncologic principles include early proximal ligation of vessels, accomplishing an anatomic resection, and minimal tumor manipulation. As the operations and their physiologic consequences differ, the management of colon and rectal cancer will be discussed separately.

References:

1. Simillis C, Lal N, Thoukididou SN, Kontovounisios C, Smith JJ, Hompes R, et al. Open versus laparoscopic versus robotic versus transanal mesorectal excision for rectal cancer: a systematic review and network meta-analysis. *Ann Surg.* 2019;270(1):59–68.
2. Silva-Velazco J, Dietz DW, Stocchi L, Costedio M, Gorgun E, Kalady MF, et al. Considering Value in Rectal Cancer Surgery. *Ann Surg.* 2017;265(5):960–8.
3. Akiyoshi T. Technical feasibility of laparoscopic extended surgery beyond total mesorectal excision for primary or recurrent rectal cancer. *World J Gastroenterol.* 2016;22(2):718.
4. Ishikawa T, Nishikawa M, Nakamoto H, Yokoyama R, Taketomi A. Laparoscopic anterior resection for rectal cancer in a patient with a ventriculoperitoneal shunt. *Asian J Endosc Surg.* 2018;11(3):259–61.
5. Wang Y, Zhao G-H, Yang H, Lin J. A pooled analysis of robotic versus laparoscopic surgery for total mesorectal excision for rectal cancer. *Surg Laparosc Endosc Percutaneous Tech.* 2016;26(3):259–64.
6. Cheung HYC, Dent OF, Richardson GL, Chan C, Keshava A, Young CJ. Pathological outcomes in rectal cancer following laparoscopic surgery. *Asia-Pacific J Clin Oncol.* 2018;14(2):e175–80.
7. Hida K, Okamura R, Sakai Y, Konishi T, Akagi T, Yamaguchi T, et al. Open versus laparoscopic surgery for advanced low rectal cancer: a large, multicenter, propensity score matched cohort study in Japan. *Ann Surg.* 2018;268(2):318.
8. Petersson J, Koedam TW, Bonjer HJ, Andersson J, Angenete E, Bock D, et al. Bowel obstruction and ventral hernia after laparoscopic versus open surgery for rectal cancer

- in a randomized trial (COLOR II). *Ann Surg.* 2019;269(1):53–7.
9. Curtis NJ, Dennison G, Brown CSB, Hewett PJ, Hanna GB, Stevenson ARL, et al. Clinical Evaluation of Intraoperative Near Misses in Laparoscopic Rectal Cancer Surgery. *Ann Surg.* 2019;
 10. Stevenson ARL, Solomon MJ, Brown CSB, Lumley JW, Hewett P, Clouston AD, et al. Disease-free survival and local recurrence after laparoscopic-assisted resection or open resection for rectal cancer: the australasian laparoscopic cancer of the rectum randomized clinical trial. *Ann Surg.* 2019;269(4):596–602.
 11. Suzumura H, Tsuruta M, Hasegawa H, Okabayashi K, Ishida T, Asada Y, et al. The impact of the mesorectal apparent diffusion coefficient value on surgical difficulty in laparoscopic anterior resection for rectal cancer. *Surg Today.* 2019;49(3):239–44.
 12. van der Pas MHGM, Deijen CL, Abis GSA, de Lange-de Klerk ESM, Haglind E, Fürst A, et al. Conversions in laparoscopic surgery for rectal cancer. *Surg Endosc.* 2017;31(5):2263–70.
 13. Jayne D, Pigazzi A, Marshall H, Croft J, Corrigan N, Copeland J, et al. Effect of robotic-assisted vs conventional laparoscopic surgery on risk of conversion to open laparotomy among patients undergoing resection for rectal cancer: the ROLARR randomized clinical trial. *Jama.* 2017;318(16):1569–80.
 14. Chen C-C, Lai Y-L, Jiang J-K, Chu C-H, Huang I-P, Chen W-S, et al. Transanal total mesorectal excision versus laparoscopic surgery for rectal cancer receiving neoadjuvant chemoradiation: a matched case–control study. *Ann Surg Oncol.* 2016;23(4):1169–76.