MEDICINE UPDATES JOURNAL

Faculty of Medicine Port Said University

Volum: 22 No:5 PP:61 -67

" *Evaluation of Hartmann's Procedure in the Management of Acute Obstructed Left Colon Cancer compared to Resection with Primary Anastomosis and a Covering Ileostomy* "

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Submitted: 03/02/2025

Accepted:19/02/2025

DOI: 10.21608/muj.2025.357806.1204

ISSN : 2682-2741

ABSTRACT:

Obstructed left-sided cancer colon is a major emergency surgical case with different means of management and it is known that colon cancer is the most common cause of colonic obstruction and this article explores different ways of surgical management of acute obstructed left colon cancer and how to achieve the best way of management for each patient.

The article aimed to evaluate postoperative complications and outcomes of Hartmann's procedure versus resection with primary anastomosis and covering ileostomy in patients with acute obstructed left colon cancer.

This article also was focusing on results of different researches and studies related to complications and feasibility of Hartmann's reversal and ileostomy closure in cases of acute obstructed left-sided cancer colon and the role of advanced laparoscopic surgery in management of such cases.

In conclusion, Hartmann's surgery is better for elderly patients who can't withstand lengthy procedures, whereas loop ileostomy is better for younger, healthy patients who can.

Keywords: Hartmann's operation, covering ileostomy, Colon Cancer, Reconstruction.

Introduction:

It is commonly recognized that colorectal cancer is the most common cause of colonic blockage. With a high sensitivity and specificity, abdomino-pelvic computed tomography scans are an effective and easily accessible diagnostic tool for correctly localizing obstructive cancer lesions. Right or left-sided obstructed colon cancer is often categorized based on relation to the splenic flexure. **(Tokode et al., 2010)**

Anatomical differences resulted in various treatment modalities based on the blockage site. The treatment of choice for right-sided cancer obstruction has been primary tumor excision along with ileo-colic anastomosis but left colon cancer has more complicated and different ways of management. **(Richards et al., 2014)**

Epidemiology:

Colon cancer affected about 107,320 new patients in the United States last year. Among all types of cancer, it is considered the second most common cause of death. **(American Cancer Society, 2025)**

Etiology and pathophysiology:

Colon cancer is a multifactorial disease. A lot of factors and causes are involved in the development of colorectal cancer such as genetic factors, environmental factors (including diet), and other inflammatory conditions of the gastrointestinal tract. Although a lot about colorectal cancer genetic basis still unknown, recent research indicates that genetic factors have the greatest effect in development of colorectal cancer. **(Zhao et al., 2021)**

Diagnosis:

Initial investigation should involve CT pelvi-abdominal with contrast. Colonoscopy is always needed for tissue biopsy and exclusion of synchronous lesion. Colonoscopy has a high sensitivity, about 94.7% (95% CI 90% to 97%), and may miss from 2% to 6% of cases, mostly right-sided. Laboratory investigations include important tumor markers such as CA 19-9, CA 125 and CEA. CT chest must be done prior to surgery to exclude chest metastasis of colon cancer and PET-CT could be done in some cases when distant metastasis is suspected. **(Dawson et al., 2019)**

Management of Obstructive Colon Cancer:

Different studies on obstructed colon cancer have found that Patients undergoing urgent surgery for acute obstructed left colon cancer have worse outcome when compared to patients undergoing elective surgery. **(Decker et al., 2020)**

Researches that studied the anatomical difference between parts of the colon found that this difference led to different management options depending on the site of the tumor. Tumor removal with primary ileo-

transverse anastomosis has been considered the best option to treat right obstructive cancer colon. **(Otani et al., 2018)**

On the other hand, numerous studies on various management strategies for left-sided obstructive colon cancer have found that this type of cancer presents different treatment options, each yielding variable results and outcomes. The examined options include complete tumor resections with or without primary anastomosis, and with or with the formation of a stoma. Additionally the approaches of performing a decompression loop colostomy followed by delayed tumor resection, anastomosis after on table lavage, total colectomy and ileo-rectal anastomosis and colonoscopic stenting have also been investigated. **(Baer et al., 2017)**

Left-sided cancer obstruction:

In comparison of different management options for left-sided obstructive colon cancer, studies have shown that tumor excision with end colostomy has been usually chosen in emergency cases of obstructive left-sided colon cancer. However, emergency surgery has been recognized as an independent risk factor for death. In case of emergency surgery a significant number of patients end up with stoma which may be temporary or permanent stoma. Furthermore, second reconstruction surgery is associated with a high morbidity rate of 21% to 36%. **(Hallam et al., 2018)**

Researchers also found that decompression colostomy is acceptable alternative for damage control in acute obstructed left cancer colon. In case of formation of a diverting stoma, a second stage operation is needed for primary tumor resection with or without stoma reconstruction. In some cases, stoma reconstruction is done at a third operation. **(Hallam et al., 2018)**

More studies on emergency cases have found that there is a high risk of leakage at any anastomosis. A lot of surgeons avoid anastomosis in the management of acute obstructed left colon cancer. On the other hand, a two-stage surgery such as Hartmann's operation has higher morbidity and mortality related to the reconstructive surgery and reduced quality of life in case of reconstruction failure. Nonetheless, some skilled surgeons tried to make primary anastomosis after tumor removal and demonstrated its safety and feasibility in selected emergency patients. **(Zorcolo et al., 2003)**

A lot of research extensively studied high-risk conditions, such as old age, comorbidities, advanced tumor stage, malnutrition, and peritoneal contamination and identified risk factors related to mortality and fatal complications such as anastomotic leakage. Recently, tumor resection and primary anastomosis becomes the preferred option for uncomplicated left obstructed colon cancer when there is low risk for anastomotic leakage. **(Awotar et al., 2017)**

Hartmann's operation:

Hartmann's operation or Hartmann's procedure is the surgical resection of the recto-sigmoid colon with closure of the ano-rectal stump and formation of an end colostomy. It is one of the treatment options of colon cancer or colonic inflammatory conditions. Recently, its use is limited to emergency setting when primary anastomosis is not safe with high risk of leakage, or more rarely it is used palliative in patients with advanced irresectable colorectal tumors. **(Ronel & Hardy, 2002)**

A lot of studies found that Hartmann's procedure had significant mortality rate and one study showed no statistically significant difference in morbidity or mortality between laparoscopic versus open Hartmann procedure with less postoperative complications in case of laparoscopic cases. **(Viggor et al., 2011)**

An important recent cohort study about Hartmann's postoperative complications found that high mortality rate of 33.3% and high morbidity with percentage of 25.3%. Complications include wound infection (12.96%), abdominal abscess (8.02%), stoma necrosis and retraction (1.23%), wound evisceration (1.23%) and leakage (0.62%). **(Kocataş, 2023)**

Another study about Hartmann's reconstruction complications found that relatively high morbidity and mortality rate with a percentage of 3.6% of anastomotic leakage, 1.8% of wound infections, 1.8% of stress ulcer and 3.6% of reconstruction failure and permanent stoma and percentage of mortality was 3.6%. **(Zarnescu et al., 2015)**

Numerous researches about complications of primary anastomosis and covering ileostomy found that high rate of complications related to ileostomy with skin laceration (19.4%), stoma retraction (4.7%), high output fistula (3.5%) and para-stomal hernia (2.3%). Percentage of anastomotic leakage was 5.2%. **(Mehboob et al., 2020)**

It was found in another study that complications related to loop ileostomy closure are less likely to be fatal than Hartmann's, with a better death rate of 1.5%, an anastomotic leakage rate of 2.3%, wound infection rate of 3%, bowel obstruction rate of 6.8% and entero-cutaneous fistula rate of 0.76%. **(Poskus et al., 2014)**

Bowel Resection and Anastomosis:

A lot of studies have been done about general rules that must be followed during bowel anastomosis and recommended that ensuring good blood flow, ensuring good bowel mobilization to avoid tension, ensuring keeping anti-mesenteric border shorter and ensuring adequate blood supply by making the angle of transection line straight or somewhat oblique. **(Bosmans et al., 2015)**

Anastomosis complications and management:

- Anastomotic Leakage: causes increased mortality, increased hospital stay, high risk of recurrence, chronic Sinus at presacral area, stricture and is mostly diagnosed by CT abdomen and pelvis with oral and IV contrast and mostly managed by surgical exploration. **(Gessler et al., 2017)**

Anastomotic leakage signs and symptoms include severe abdominal pain, tachycardia, fever, ileus and tachypnea. Severe cases show signs of end organ failure such as disturbed conscious level, low urine output with elevated serum creatinine, elevated liver enzymes. If drain is placed, feculent or enteric discharge is seen. Laboratory investigations show increased total leukocytic count and inflammatory markers such as CRP and procalcitonin. **(Hernandez et al., 2021)**

- Bleeding: minor bleeding which is defined as the bleeding that does not need blood transfusion or urgent intervention but major bleeding is defined as the bleeding that makes the patient hemodynamically unstable or requires blood transfusion or urgent surgical or laparoscopic intervention. **(Chiarello et al., 2022)**

- Stricture: stricture after tumor resection requires a favorable evaluation of possibility of recurrence (CEA, CT, EUS, etc.). For benign strictures, treatment includes repeated endoscopic dilatation. For malignant stricture without metastases or strictures that don't get better after repeated endoscopic dilations, surgery is necessary. **(Chiarello et al., 2022)**

Role of laparoscopic surgery in acute obstructive colon cancer:

A recent meta-analysis study including 12 cohort studies comparing laparoscopic surgery and open surgery after bowel decompression by stent replacement shows that there was no statistically significant difference in the 30-day mortality rates between the two groups. Compared to the laparoscopic approach group, the open approach group had a higher rate of overall postoperative complications. Notably, laparoscopic surgery resulted in less intraoperative blood loss and a longer operation time. **(Zeng et al., 2024)**

Conclusion and Recommendations:

It can be said that older patients or vitally unstable patients at time of presentation who can't tolerate long time of surgery are better suited for Hartmann's surgery due to short time of surgery. In other hand, younger and healthy individuals who can tolerate prolonged surgery are better to do primary anastomosis with covering ileostomy since this surgery has better postoperative outcome and reconstruction success than Hartmann's procedure.

Primary anastomosis and covering ileostomy was associated with higher reconstruction success. Complications occurred higher among cases of Hartmann’s procedure.

In this instant, the surgeon is more comfortable in cases of ileostomy closure than Hartmann's reconstruction due to easy surgical procedure and better postoperative outcomes.

References:

- American Cancer Society. (2025, January 13). Colorectal Cancer Statistics | How Common Is Colorectal Cancer? Www.cancer.org. https://www.cancer.org/cancer/types/colon-rectal-cancer/about/key-statistics.html.
- Awotar, G. K., Guan, G., Sun, W., Yu, H., Zhu, M., Cui, X., Liu, J., Chen, J., Yang, B., Lin, J., Deng, Z., Luo, J., Wang, C., Nur, O. A., Dhiman, P., Liu, P., & Luo, F. (2017). Reviewing the management of obstructive left colon cancer: Assessing the feasibility of the one-stage resection and anastomosis after intraoperative colonic irrigation. Clinical Colorectal Cancer, 16(2), e89–e103. https://doi.org/10.1016/j.clcc.2016.12.001
- Baer, C., Menon, R., Bastawrous, S., & Bastawrous, A. (2017). Emergency presentations of colorectal cancer. Surgical Clinics of North America, 97(3), 529–545. https://doi.org/10.1016/j.suc.2017.01.004
- Bosmans, J. W. a. M., Jongen, A. C. H. M., Bouvy, N. D., & Derikx, J. P. M. (2015). Colorectal anastomotic healing: why the biological processes that lead to anastomotic leakage should be revealed prior to conducting intervention studies. BMC Gastroenterology, 15(1). https://doi.org/10.1186/s12876-015-0410-3
- Chiarello, M. M., Fransvea, P., Cariati, M., Adams, N. J., Bianchi, V., & Brisinda, G. (2022). Anastomotic leakage in colorectal cancer surgery. Surgical Oncology, 40, 101708. https://doi.org/10.1016/j.suronc.2022.101708
- Dawson, H., Kirsch, R., Messenger, D., & Driman, D. (2019). A review of current challenges in colorectal cancer reporting. Archives of Pathology & Laboratory Medicine, 143(7), 869–882. https://doi.org/10.5858/arpa.2017-0475-ra
- Decker, K. M., Lambert, P., Nugent, Z., Biswanger, N., Samadder, J., & Singh, H. (2020). Time trends in the diagnosis of colorectal cancer with obstruction, perforation, and emergency admission after the introduction of Population-Based Organized Screening. JAMA Network Open, 3(5), e205741. https://doi.org/10.1001/jamanetworkopen.2020.5741
- Gessler, B., Eriksson, O., & Angenete, E. (2017). Diagnosis, treatment, and consequences of anastomotic leakage in colorectal surgery. International Journal of Colorectal Disease, 32(4), 549–556. https://doi.org/10.1007/s00384-016-2744-x
- Hallam, S., Mothe, B., & Tirumulaju, R. (2018). Hartmann's procedure, reversal and rate of stoma-free survival. Annals of the Royal College of Surgeons of England, 100(4), 301–307. https://doi.org/10.1308/rcsann.2018.0006
- Hernandez, P. T., Paspulati, R. M., & Shanmugan, S. (2021). Diagnosis of Anastomotic Leak. Clinics in Colon and Rectal Surgery, 34(06), 391–399. https://doi.org/10.1055/s-0041-1735270
- Kocataş, A. (2023). Analysis of factors related to the decision of Hartmann's procedure and its reversal: a single-center experience. Turkish Journal of Trauma and Emergency Surgery. https://doi.org/10.14744/tjtes.2023.15324
- Mehboob, A., Perveen, S., Iqbal, M., Moula Bux, K., & Waheed, A. (2020). Frequency and Complications of Ileostomy. Cureus, 12(10). https://doi.org/10.7759/cureus.11249
- Otani, K., Kawai, K., Hata, K., Tanaka, T., Nishikawa, T., Sasaki, K., Kaneko, M., Murono, K., Emoto, S., & Nozawa, H. (2018). Colon cancer with perforation. Surgery Today, 49(1), 15–20. https://doi.org/10.1007/s00595-018-1661-8

- Poskus, E., Kildusis, E., Smolskas, E., Ambrazevicius, M., & Strupas, K. (2014). Complications after Loop Ileostomy Closure: A Retrospective Analysis of 132 Patients. Visceral Medicine, 30(4), 276–280. https://doi.org/10.1159/000366218
- Richards, C. H., & Roxburgh, C. S. D. (2014). Surgical outcome in patients undergoing reversal of Hartmann's procedures: a multicentre study. Colorectal Disease, 17(3), 242–249. https://doi.org/10.1111/codi.12807
- Ronel, D. N., & Hardy, M. A. (2002). Henri Albert Hartmann: Labor and discipline. Current Surgery, 59(1), 59–64. https://doi.org/10.1016/s0149-7944(01)00572-4
- Tokode, O. M., Akingboye, A., & Coker, O. (2010). Factors affecting reversal following Hartmann's procedure: Experience from two district general hospitals in the UK. Surgery Today, 41(1), 79–83. https://doi.org/10.1007/s00595-009-4224-1
- Viggor, S., Willis, A., & Jawad, A. (2011). Behcet disease. Grand Rounds, 11(1), L1–L2. https://doi.org/10.1102/1470-5206.2011.l001
- Zarnescu, E., Zarnescu, N., Costea, R., Rahau, L., & Neagu, S. (2015, December 1). Morbidity after reversal of Hartmann operation: retrospective analysis of 56 patients. https://pmc.ncbi.nlm.nih.gov/articles/PMC4656958/
- Zeng, K., Zhang, F., Yang, H., Zha, X., & Fang, S. (2024). Laparoscopic versus open surgery in obstructive colorectal cancer patients following stents placement: a comprehensive meta-analysis of cohort studies. Surgical Endoscopy, 38(4), 1740–1757. https://doi.org/10.1007/s00464-024-10710-4
- Zhao, X., Yuan, C., Wangmo, D., & Subramanian, S. (2021). Tumor-Secreted extracellular vesicles regulate T-Cell costimulation and can be manipulated to induce Tumor-Specific T-Cell responses. Gastroenterology, 161(2), 560-574.e11. https://doi.org/10.1053/j.gastro.2021.04.036
- Zorcolo, L., Covotta, L., Carlomagno, N., & Bartolo, D. C. C. (2003). Safety of primary anastomosis in emergency colo-rectal surgery. Colorectal Disease, 5(3), 262–269. https://doi.org/10.1046/j.1463-1318.2003.00432.x