

CHARACTERISTICS OF COLON OBSTRUCTION AMONG PATIENTS WITH COLORECTAL CANCER IN PROF. DR. I.G.N.G. NGOERAH GENERAL HOSPITAL DENPASAR 2021-2022

Christine Natalia¹, Yuliana^{2*}, Gede Wirata², Jaqueline Sudiman²

¹ Undergraduate Medical Study Program, Faculty of Medicine, Udayana University

² Department of Anatomy, Faculty of Medicine, Udayana University

Correspondence

Yuliana

Department of Anatomy, Faculty of Medicine, Udayana University

e-mail: yuliana@unud.ac.id

ABSTRACT

Introduction: Large bowel obstruction (LBO), characterized by the blockage of the colon lumen, can lead to severe complications such as intestinal ischemia or perforation. Colorectal cancer (CRC) is a significant health concern globally. The case of LBO in patients with CRC is associated with poor patient outcomes. However, many studies showed inconsistent data and findings regarding the risk factors of LBO in CRCs. This study investigates characteristics of LBO among patients diagnosed with obstructive CRC at Prof. dr. I.G.N.G. Ngoerah General Hospital Denpasar from 2021 to 2022.

Methods: A cross-sectional descriptive study was conducted on 70 samples who met the inclusion criteria. Demographic factors, medical history, and clinical presentation data were collected.

Results: Findings revealed that the majority of the study participants were male (71.4%), aged 50-69 years (67.1%), and had an ideal BMI (52.9%). Clinically, most subjects (45.7%) were at stage TxNxM1 (stage IV) of CRC without a history of gastrointestinal issues (52.9%). Most patients also presented with partial obstruction (71.4%), with the rectum being the most common site (42.9%).

Conclusion: This study highlights the demographic and clinical characteristics of LBO in obstructive CRC patients. Further research is needed to explore additional risk factors, including lifestyle and dietary patterns, to improve prevention strategies and clinical management for this patient population.

Keywords :Colorectal cancer, colon obstruction, cross-sectional study, Prof. dr. I.G.N.G Ngoerah General Hospital.

INTRODUCTION

Lifestyle changes have contributed to the rise of various communicable and non-communicable diseases, including intestinal obstruction¹, which is classified into Large Bowel Obstruction (LBO) and Small Bowel Obstruction (SBO) based on its location². Although they differ based on their location, both types of obstruction have atypical symptoms of abdominal cramping, nausea, vomiting, constipation, and bloating.¹ However, some cases of intestinal obstruction can also lead to serious complications, such as ischemia or perforation.² Compared to SBO cases, LBO patients tend not to experience vomiting early in the disease.³

LBO typically presents as a medical emergency. 50% of LBO cases are caused by colorectal cancer (CRC) that

primarily affects the left colon (descending colon, sigmoid, and rectum). This is due to its association with poorly differentiated tumor cell types which are histopathologically more challenging to identify in proximal right CRC.^{4,5} Therefore, the term “obstructive CRC” used in the study refers to LBO among CRC patients. Besides CRC, other causes of LBO include volvulus (10-17% of cases) and diverticular stricture or complications of acute diverticulitis, such as abscesses (around 10% of cases).²

In Indonesia, LBO accounts for 26.1% of intestinal obstruction cases.¹ Despite being typically observed in patients over 50, cases among those under 50 are increasing, often presenting in advanced stages due to the absence of routine screening.⁶ However, many studies assessing the correlation between various demographic and clinical

factors with LBO incidence in CRC patients have shown inconsistent data and findings^{4,5,7-9}, adding to the difficulty in determining effective screening and early prevention targets. Therefore, this study investigates the demographic and clinical characteristics of LBO among obstructive CRC patients at Prof. dr. I.G.N.G Ngoerah General Hospital Denpasar 2021-2022, aiming to raise public awareness and promote early prevention to avoid a decline in productivity and quality of life.

MATERIALS AND METHODS

A descriptive study was conducted from August to September 2024 towards 70 medical records of patients diagnosed with obstructive colorectal cancer (CRC) at Prof. Dr. I.G.N.G Ngoerah General Hospital, Denpasar, during 2021–2022. Ethical approval was obtained from the Research Ethics Committee of the Udayana Medical Faculty, under reference number 1456/UN14.2.2.VII.14/LT/2024. Data collected included patient demographics (age, sex, BMI), medical history, and clinical characteristics such as tumor location, type, and stage.

The study employed a cross-sectional sampling method, resulted in 70 out of 153 patients who met the predefined inclusion and exclusion criteria. Inclusion criteria consisted of patients with obstructive CRC who were registered in the Hospital Management Information System of Prof. Dr. I.G.N.G Ngoerah General Hospital (SIMARS RS Prof. Ngoerah), had a complete medical record of SOAP documentation, physical examination findings, primary and secondary diagnoses (complications and comorbidities), BOF or CT scans results, and treatment history. Patients who had undergone any therapy, with or

without surgical intervention, as well as those with complications, were also included. Exclusion criteria included patients with multiple obstructions (>1 obstruction) and those lacking BOF or CT scan results.

As a descriptive study, the collected data were then extracted into IBM SPSS Statistics version 25 to undertake univariate analysis. Data distribution was presented in terms of frequencies (N) and percentages (%), which were categorized based on demographic characteristics (gender, age group, and BMI) and clinical characteristics, including the location and type of obstruction, CRC stage, and history of gastrointestinal disease.

RESULTS

The sociodemographic distribution of patients with obstructive colorectal cancer (CRC) treated at Prof. dr. I.G.N.G Ngoerah General Hospital, Denpasar, during 2021–2022 were assessed based on gender, age, and Body Mass Index (BMI).

This study showed that the majority of patients were male (n = 71.4%) within the average age of 57.8 years, as shown in **Table 1**. The age distribution showed most patients were within 50-69 years old (67.1%) and the fewest were aged ≥70 years (15.7%). BMI was also classified into four categories, with the majority of patients falling within the ideal BMI range, comprising 37 individuals (52.9%). The average BMI of the patients was 21.49 kg/m².

The clinical characteristics of patients assessed in this study were outlined in **Table 2**. These characteristics include the location and type of obstruction, CRC stage, and the presence or absence of a history of gastrointestinal (GI) disorders.

Table 1. Demographic Characteristics of Research Samples

Variable	N	%	Mean (± SD)	Median
Gender				
Women	20	28,6		
Men	50	71,4		
Age (years)				
≤ 30	0	0,0	57,84	58,00
31-49	12	17,1	(±11,144)	
50-69	47	67,1		
≥ 70	11	15,7		
Body Mass Index (kg/m ²)				
Underweight	12	17,1	21,49	21,09
Normal	37	52,9	(±3,313)	
Overweight	9	12,9		
Obesity	12	17,1		

N: number of patients, %: percentage, SD: standard deviation.

The results showed that the rectum was the most common site of obstruction, observed in 30 patients (42.9%), followed by the sigmoid colon in 23 patients

(32.9%). The majority of patients (71.4%) experienced partial obstruction, accounting for 50 cases.

Table 2. Clinical Characteristics of Obstruction in Research Samples

Variable	N	%
Location		
Caecum/Ascendens	6	8,6
Transversum	7	10,0
Descendens	4	5,7
Sigmoid	23	32,9
Rectum	30	42,9
Types		
Total	20	28,6
Partial	50	71,4
Cancer Stage		
T ₃₋₄ N _x M _x	5	7,1
T _x N ₁ M _x	19	27,1
T _x N ₂ M _x	14	20,0
T _x N _x M ₁	32	45,7
History of Gastrointestinal Disease		
Present	33	47,1
None	37	52,9

N: number of patients, %: percentage

Adopting the colorectal cancer staging system from the 8th Edition of the American Joint Committee on Cancer (AJCC), this study classified CRC into four stages. The findings revealed that most patients presented with advanced-stage CRC (TxNxM1), with 32 cases (45.7%).

Additionally, 37 patients (52.9%) were reported to have a history of GI disorders. The most frequently reported conditions included tumors (14 cases), hemorrhoids (11 cases), and obstructive ileus (9 cases). Several other GI diseases were also identified, as detailed in **Table 3**.

Tabel 3. Various Gastrointestinal Diseases History of Research Subjects

History of Gastrointestinal Disease	N
Benign Colorectal Tumor	14
Hemorrhoid	11
Obstructive Ileus	6
Others	9
Colon Diverticulitis	1
Colon Fistula	1
Colon Polyp	2
Colon Adhesion	2
Colonic Situs Invertus	1
Appendicitis	2

N: number of patients

DISCUSSION

Large bowel obstruction (LBO) is a condition caused by blockage in the colon lumen, accompanied by proximal dilation.¹ Epidemiologically, LBO is less common than small bowel obstruction (SBO), accounting for 10-15% of all intestinal obstruction cases. More than half of LBO cases are attributed to colorectal cancer, a multifactorial disease influenced by demographic and lifestyle factors such as age, sex, family history, comorbidities (e.g., gastrointestinal conditions), physical inactivity, a high-fat/low-fiber diet, and smoking.³ This study aims to analyze the demographic characteristics (age and sex), body mass index (BMI), and gastrointestinal (GI) history of 70 colorectal cancer patients

with obstruction at RSUP Prof. Dr. I.G.N.G. Ngoerah Denpasar between 2021 and 2022. A univariate analysis was conducted to explore patient characteristics, including sex distribution, age groups, BMI, obstruction location, and associated GI conditions.

The findings showed that male patients represented the majority of cases, aligning with previous study⁴ which reported a 65.7% male predominance among colorectal cancer patients. However, these findings contrast with earlier research by Dwijayanthi et al.⁵ at the same hospital, where the majority of patients were female (92.3%). Such discrepancies might be explained by differences in life expectancy between sexes, delayed diagnoses due to tumor

histopathology challenges in women, or higher sensitivity of fecal occult blood tests (iFOBT) in men.^{4,5}

Regarding age distribution, most patients were in the 50-69 age group, consistent with the protective role of estrogen in premenopausal women. Estrogen is known to inhibit colorectal tumor proliferation by regulating colon epithelial growth, reducing bile acid and insulin-like growth factor levels. Postmenopausal women, however, lose this hormonal protection, increasing their risk.⁵ Studies such as those by Primatama et al.⁴ and Shah et al.⁶ have highlighted shifting age trends in colorectal cancer onset due to lifestyle changes, particularly diet. However, this study did not find evidence of significant age-related trend shifts, emphasizing the continued importance of screening in populations aged 50 and above.

The BMI analysis revealed that most patients had a normal weight, which may reflect cancer-associated weight loss and appetite decline often seen in advanced stages. This is consistent with previous studies^{4,5}, which linked underweight status in colorectal cancer patients to late-stage diagnosis and chronic weight loss. The finding that normal-weight patients were the majority in this study could also reflect the advanced-stage nature of many cases, where weight loss becomes more pronounced.^{4,5}

Clinically, obstructions were predominantly located in the distal colon (descending colon, sigmoid, and rectum), aligning with the anatomical ease of detecting left-sided lesions via colonoscopy compared to right-sided lesions. Tumors in the proximal colon are often poorly differentiated and more challenging to detect, as noted in studies by Dwijayanthi et al.⁵ and Primatama et al.⁴. Furthermore, most patients in this study presented with advanced-stage cancer (92.8% had metastasis or nodal involvement). Late-stage diagnosis is a persistent challenge in Indonesia, in which limited access to healthcare and low public awareness delay diagnosis.⁵

GI histories in patients included conditions such as colonic tumors, hemorrhoids, and obstructive ileus. Chronic inflammation associated with these conditions is well-documented as a driver of dysplasia and subsequent malignancy.^{7,10,11} Hemorrhoids, in particular, are significantly associated with an elevated risk of colorectal cancer. Study observed that patients with hemorrhoids had a higher incidence of colorectal cancer, especially in the rectum and sigmoid colon, likely due to chronic local inflammation.¹² Other GI conditions such as diverticulitis, colonic adhesions, and polyps were also noted, with similar mechanisms of chronic inflammation and dysplasia contributing to cancer development.^{10,13-15.}

This study identified a rare case of colonic situs inversus (SIT), a congenital condition where abdominal and thoracic structures are mirror images of their normal arrangement. However, SIT is not inherently associated with malignancy.^{10,11}

The high proportion of late-stage diagnoses (45.7% in metastatic stages) underscores the urgency of early detection. Studies have consistently demonstrated that early-stage diagnosis significantly improves survival rates.^{17,18} However, in Indonesia, colorectal cancer patients often

present at advanced stages, reducing treatment efficacy and survival rates. This delay may be compounded by limited screening programs and low public awareness.^{17,19,20}

CONCLUSION AND SUGGESTION

Lifestyle changes have contributed to the rise of colorectal cancer (CRC) incidence, leading to higher occurrence of large bowel obstruction (LBO). This study found that most patients with obstructive colorectal cancer at Prof. dr. I.G.N.G Ngoerah General Hospital 2021-2022 were male, had an ideal Body Mass Index (BMI), and belonged to the 50-69 age group, with a median age of 58 years. Clinically, the majority presented with obstruction located in the rectum, partial obstruction, and were diagnosed at stage IV (TxNxM1). Additionally, most patients did not have a history of gastrointestinal issues. For those with such a history, the most common complaints included colon tumors, hemorrhoids, and obstructive ileus. These findings proved the significance of demographic factors such as age and gender, as well as clinical factors like obstruction location and gastrointestinal history, in characterizing obstructive CRC patients can be used to raise public awareness and promote early prevention to avoid a decline in productivity and quality of life.

REFERENCES

1. Wardani D. Manajemen Asuhan Keperawatan Kritis pada Tn. S dengan Diagnosis Ileus Obstruktif di Ruang ICU RS Ibnu Sina Makassar [Internet]. 2022 Feb 14 [cited 2023 Sep 18];0(0):1-10. Available from: <https://www.scribd.com/document/666586286/896ed2aec7c0345a471fd2df2b233453>.
2. Dewi KFP. Karakteristik Ileus Obstruktif di RSUP Dr. Wahidin Sudirohusodo Makassar Tahun 2018 [Internet]. 2020 [cited 2023 Sep 18];0(0):1-21. Available from: [http://repository.unhas.ac.id/id/eprint/1221/2/C011171545_skripsi\(FILEminimizer\)_1-2.pdf](http://repository.unhas.ac.id/id/eprint/1221/2/C011171545_skripsi(FILEminimizer)_1-2.pdf)
3. Lieske B, Meseeha M. Large Bowel Obstruction. StatPearls [Internet]. 2023 Aug 8 [cited 2023 Sep 18];0(0):000. Available from: <https://pubmed.ncbi.nlm.nih.gov/28722918/>
4. Primatama NPV, Siswandi A, Triwahyuni T, Purnanto E. Gambaran Faktor Risiko Kejadian Kanker Kolorektal di RSUD Dr. H. Abdul Moeloek. JIKKI. 2023;10(7):2463-2466.
5. Dwijayanthi NKA, Dewi NNA, Mahayasa IM, Surudarma IW. Karakteristik Pasien Kanker Kolorektal di Rumah Sakit Umum Pusat (RSUP) Sanglah Berdasarkan Data Demografi, Temuan Klinis dan Gaya Hidup. Jurnal Medika Udayana. 2020;9(6):55-61.
6. Shah D, Makharia GK, Ghoshal UC, Varma S, Ahuja V, Hutfless S. Burden of Gastrointestinal and Liver Diseases in India. Indian J Gastroenterol. 2018;37(5):439-445.

7. Grigorean VT, Erchid A, Coman I, Lițescu M. Colorectal Cancer, The “Parent” of Low Bowel Obstruction. *Medicina*. 2023;59(5):875.
8. Lewandowska A, Rudzki G, Lewandowski T, Strykowska-Góra A, Rudzki S. Risk Factors for the Diagnosis of Colorectal Cancer. *Cancer Control*. 2022;29:000.
9. Murphy N, Ward HA, Jenab M, Rothwell JA, Boutron-Ruault MC, Carbonnel F. Heterogeneity of Colorectal Cancer Risk Factors by Anatomical Subsite in 10 European Countries: A Multinational Cohort Study. *Clin Gastroenterol Hepatol*. 2019;17(7):1323–1331.
10. Hu JL, Li QY, Wu K. Ascending colon cancer and situs inversus totalis – altered surgeon position for successful laparoscopic hemicolectomy: A case report. *World J Clin Oncol*. 2022;13(10):848–852.
11. Oh SY, Kim CW, Kim S, Kim MH, Kim Y, Il Lee JL, Yoon YS, Park IJ, Lim SB, Yu CS. Complete Obstruction, a Real Risk Factor: A Comprehensive Study on Obstruction in Stage IIA Colon Cancer With Propensity Score Matching Analysis. *Clin Colorectal Cancer*. 2024;23(2):135-146.e3.
12. Gharib E, Robichaud GA. 2024. From Crypts to Cancer: A Holistic Perspective on Colorectal Carcinogenesis and Therapeutic Strategies. *Int J Mol Sci*. 2024;25(17):9463.
13. Wu EB, Sung FC, Lin CL, Wu KL, Chen KB. 2021. Colorectal cancer risk in patients with hemorrhoids: A 10-year population-based retrospective cohort study. *Int J Environ Res Public Health*. 2021;18(16):000.
14. Zuo Y, Jing Z, Bie M, Xu C, Hao X, Wang B, Babic Z. Association between *Helicobacter pylori* infection and the risk of colorectal cancer: A systematic review and meta-analysis. *Medicine*. 2020;99(37):e21832.
15. Loosen SH, Mertens A, Klein I, Leyh C, Krieg S, Kandler J, Luedde T, Roderburg C, Kostev K. 2024. Association between *Helicobacter pylori* and its eradication and the development of cancer. *BMJ Open Gastroenterol*. 2024;11(1):e001377.
16. Sari YA, Sueta MAD. Ascending colon cancer and situs inversus totalis: a case report in Sanglah general hospital Denpasar, Bali. *Int J Res Med Sci*. 2019;7(6):2433.
17. Yoo RN, Cho HM, Kye BH. Management of obstructive colon cancer: Current status, obstacles, and future directions. *World J Gastrointest Oncol*. 2021;13(12):1850–1862.
18. Doshi R, Desai J, Shah Y, Decter D, Doshi S. Incidence, Features, In-Hospital Outcomes and Predictors of In-Hospital Mortality Associated with Toxic Megacolon Hospitalizations in the United States. *Intern Emerg Med*. 2018;13(6):881–887.
19. Decker K, Lambert P, Nugent Z, Biswanger N, Samadder J, Singh H. Time Trends in the Diagnosis of Colorectal Cancer With Obstruction, Perforation, and Emergency Admission After the Introduction of Population-Based Organized Screening. *JAMA Netw Open*. 2020;3:e205741.
20. Pisano M, Zorcolo L, Merli C, Cimbanassi S, Poiasina E, Ceresoli M, Agresta F, Allievi N, Bellanova G. 2017 WSES Guidelines on Colon and Rectal Cancer Emergencies: Obstruction and Perforation. *World Journal of Emergency Surgery*. 2018;13(36):000.

