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Original Research Article

Proportion of colonic carcinoma in cases presenting with acute intestinal obstruction: a cross sectional study

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ABSTRACT

Background: Acute intestinal obstruction is one of the most common emergencies encountered by the general surgeon in routine practice. Although historically, obstructed hernia has been the most common cause, recent studies have shown that adhesive intestinal obstruction is now the commonest reason. Malignant bowel obstruction is also on the rise especially with the change in dietary habits. This study aims at identifying the proportion of colonic carcinoma in cases presenting with acute intestinal obstruction.
Methods: The patients with acute intestinal obstruction which was diagnosed clinically and radiologically were studied. Based on operative and clinical findings along with investigation results, the etiology was identified. The patients having colonic neoplasms were identified and the data was compared with other etiological factors to find out the proportion of colonic carcinoma in the cases.
Results: The proportion of colon cancer in patients presenting with acute intestinal obstruction was around 15%. The most common cause was obstructed hernia followed by post-operative adhesions. Males were more commonly affected than females. Most of the cases underwent operative management. The most common age group affected was around 50-60 years.
Conclusions: This study confirms that there is a definite rise in the number of cases of colon cancer presenting as acute intestinal obstruction. There is also a skewing of the age at presentation towards younger age groups. Small bowel obstructions were much more common mainly due to adhesions and obstructed herniae.

Keywords: Acute intestinal obstruction, Colonic carcinoma, Obstructed hernia

INTRODUCTION

Intestinal obstruction is one of the common acute abdominal emergencies that accounts for 20% of all admissions with acute abdominal pain in surgical practice.[1] The most frequent etiological factor is post operative adhesions in developed countries and strangulating herniae in developing countries.[2] Decades ago the hernia was described as the first cause of intestinal obstruction.[3] Intestinal obstruction may be classified into two types, dynamic and adynamic.[4] Adynamic obstruction is due to the paralysed bowel without any medical cause.[5] The resulting nausea, vomiting, pain and dehydration usually require in patient hospitalisation.[6,7]

Over 15% of colorectal cancers will present as acute colonic perforation or obstruction despite cancer screening programs and routine endoscopy.[8,9] Colorectal cancers may be detected early through asymptomatic screening tests or as a result of a diagnostic workup for symptomatic disease. Screening methods currently recommended by the US Preventive Services Taskforce include flexible sigmoidoscopy, barium enema, annual fecal occult blood testing and colonoscopy.[10]

A crucial problem in management of acute intestinal obstruction is differentiating whether there is actual or impending bowel ischemia and whether there is a need for emergency surgery.[11] The time interval before operation must be a critical problem for acute intestinal obstruction because prolonged conservative therapy might be harmful and potentially lethal. On the other hand, too radical option of operation will aggravate the burden on patients.[12]

In clinical practice uncommon causes such as recurrent cancer, an obstructive colon lesion in the presence of an incompetent ileocecal valve, an occult hernia, tuberculous stricture and small bowel arterial or venous ischemia should be kept in mind.[13]

The objective of this study is to find the proportion of colonic carcinoma in cases presenting as acute intestinal obstruction in a tertiary health care centre over a period of one year and also to determine the other prominent etiological factors in cases presenting with acute intestinal obstruction.

METHODS

The study was a cross sectional study conducted in patients who attended the surgery casualty/out patient department of the Department of General Surgery, Government medical college, Thrissur, Kerala, India with acute intestinal obstruction. It was conducted for a period one year from June 2019- June 2020.

Selection criteria

The patients presented with acute onset of vomiting, constipation and abdominal distension were taken into study. Diagnosis of intestinal obstruction was made based on clinical examination, history, image evidence in x ray and ultrasonogram. The diagnosis of colonic carcinoma was based on follow up of the patients by contrast enhanced CT abdomen, biopsy following laparotomy and CEA levels. Patients who had improvement of suggestive symptoms, symptoms due to obstruction at the level of gastric outlet and adynamic intestinal obstruction cases were excluded from the study.

Ethical approval

Approval was obtained from Institutional Ethics Committee, Government medical college, Thrissur.

Sample size calculation

Sample size was calculated by using values of a similar study, McEntee et al.[3]

Alpha error at 95% confidence interval (zx) = 1.96

Sample size, n = (zx)*(zx)*p*q/d*d

p = proportion of colonic neoplasms , q = 100-p , d = absolute precision of p.

Sample size was estimated to be 204.

Statistical analysis

Data was coded and entered in MS excel spreadsheet and Statistical package for social sciences (SPSS) for windows were used for analysis. Quantitative variables were expressed in terms of mean and standard deviation. Qualitative variables were expressed in terms of frequencies and percentages. Independent t test and chi square analysis were used to determine significant association and to determine significant mean differences.

RESULTS

The age of the participants ranged from 13 to 90 years. The mean (SD) of the participants was 57.06 (15.9) years. The average age of patients diagnosed with carcinoma colon was 60.04.

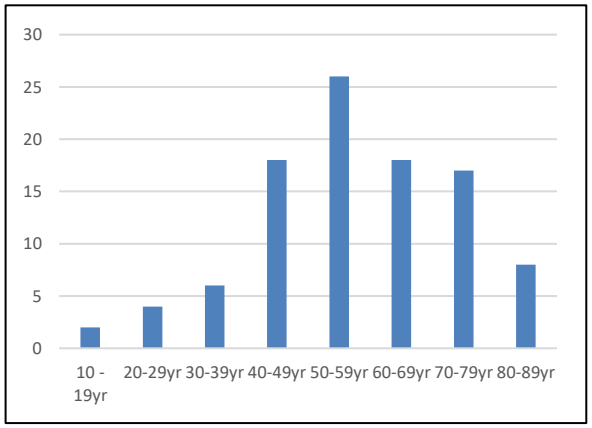

Figure 1: Age distribution of study population.

Table 1: Gender distribution of study population.

Gender	N	%
Male	124	73.8
Female	44	26.2

Table 2: Clinical history of study participants.

	Number of participants n (%)	95% confidence interval
Diet		
Vegetarian	16 (9.52)	5.88-15.04
Non vegetarian	152 (90.48)	84.95-94.11
History of previous laparotomy		
Present	64 (38.1)	31.00-45.73
Absent	104 (61.9)	54.26-69.00

Clinical history of study participants

Majority of the participants 152 (90.48%) were having non vegetarian diet. In total 64 (38.1%) patients had history of previous laparotomy.

Table 3: Final diagnosis of study participants.

Final diagnosis	N (%)	95%CI
Obstructed hernia	55 (32.74)	26.01-40.26
Adhesive obstruction	43 (25.60)	19.51-32.80
Carcinoma colon	26 (15.48)	10.72-21.83
Intestinal metastasis	3 (1.79)	0.57-5.45
Intussusception	5 (2.98)	1.23-7.01
Carcinoma rectum	12 (7.14)	4.08-12.22
Ileocaecal TB	8 (4.76)	2.38-9.29
Sigmoid volvulus	7 (4.17)	1.98-8.54
Appendicular malignancy	1 (0.60)	0.08-4.18
Malrotation	2 (1.19)	0.29-4.70
Pseudoobstruction	2 (1.19)	0.29-4.70
Lymphoma	2 (1.19)	0.29-4.70
Congenital bands	1 (0.60)	0.08-4.18
Acute appendicitis	1 (0.60)	0.08-4.18

Distribution of study subjects by management

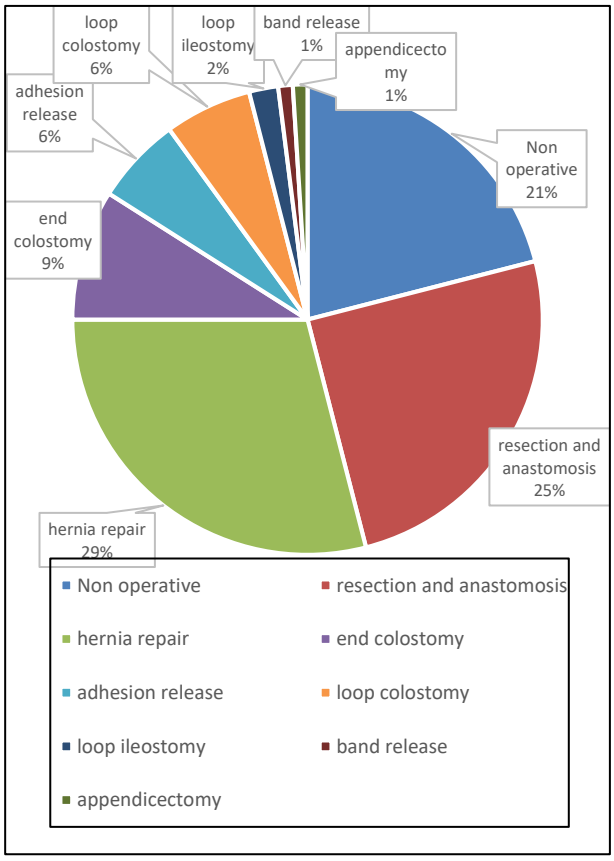

Figure 2: Management of study population.

Distribution of study subjects by final diagnosis

The most common diagnosis was obstructive hernia (32.74), followed by adhesion obstruction (25.60%) and Carcinoma colon (15.48%).

Association between gender and diagnosis

Table 4: Gender and diagnosis of study population.

Diagnosis	Gender	
	Males (n=124)	**Females (n=44)**
Obstructed hernia	40 (32.26)	15 (34.09)
Adhesive obstruction	31 (25.00)	12 (27.27)
Carcinoma colon	15 (12.10)	11 (25.00)
Intestinal metastasis	3 (2.42)	0 (0)
Intussusception	5 (4.03)	0 (0)
Carcinoma rectum	11 (8.87)	1 (2.27)
Ileocaecal TB	5 (4.03)	3 (6.82)
Sigmoid volvulus	6 (4.84)	1 (2.27)
Appendicular malignancy	0 (0)	1 (2.27)
Malrotation	2 (1.61)	0 (0)
Pseudoobstruction	2 (1.61)	0 (0)
Lymphoma	2 (1.61)	0 (0)
Congenital bands	1 (0.81)	0 (0)
Acute appendicitis	1 (0.81)	0 (0)

Gender association between carcinoma colon

Table 5: Gender association of carcinoma colon.

Variable	Final Diagnosis		P value
	Other diagnosis (n=142)	**Carcinoma colon (n=26)**	
Gender			
Female	33 (75.00)	11 (25.00)	0.042
Male	109 (87.90)	15 (12.10)	

There was higher prevalence of Carcinoma Colon among females compared to males (25% vs 12.10%) which was statistically significant with chi square of 4.13 and p value 0.042.

Association between clinical features and ca colon

DISCUSSION

The study population consisted of 168 people with a mean age of 57 years. It included 124 men and 44 women. Another study by Adhikari et al showed the most common group of patients presenting with intestinal obstruction was between 40-49 years.[14]

The most common cause for intestinal obstruction in this study was obstructed inguinal hernia. This was followed by adhesive intestinal obstruction. On comparison, a study by McEntee et al showed adhesions as the most important cause of intestinal obstruction in western population.[3] The higher incidence of obstructed hernia as the leading cause in developing countries could be due to absence of accessibility to surgeons in rural areas. This results in most of the asymptomatic hernias to be left untreated and ultimately becoming obstructed.

Table 6: Clinical features and carcinoma colon.

Variable	Final Diagnosis		P value
	Other diagnosis n=142	Carcinoma colon n=26	
Diet			
Vegetarian	16 (100)	0 (0)	0.14
Non vegetarian	126 (82.89)	26 (17.11)	
Previous laparotomy			
Present	61 (95.31)	3 (4.69)	0.002
Absent	81 (77.88)	23 (22.12)	
Abdominal distension			
Present	94 (79.66)	24 (20.34)	0.009
Absent	48 (96.00)	2 (4)	
Vomiting			
Present	93 (84.55)	17 (15.45)	0.99
Absent	49 (84.48)	9 (15.52)	
Guarding			
Present	85 (84.16)	16 (15.84)	0.87
Absent	57 (85.07)	10 (14.93)	
Obstipation			
Present	110 (82.09)	24 (17.91)	0.08
Absent	32 (94.12)	2 (5.88)	
Dehydration			
Present	46 (77.97)	13 (22.03)	0.08
Absent	96 (88.07)	13 (11.93)	

Colorectal tumors formed 21.6% of the cases in this study. The proportion of colon cancer in cases presenting with symptoms of intestinal obstruction was around 15%. The average age of patients diagnosed with carcinoma colon was 60. The sex ratio in this study showed a male predominance by almost 3:1. In the study by Pillai et al the male to female ratio was 1.75:1.[17] In the study by Adhikari et al the male to female ratio was 4:1.[14] It was noticed that none of the patients who were vegetarian were diagnosed with carcinoma colon.

Most of the patients were managed with hernia repair owing to the increased proportion of cases. The next most common line of management was resection and anastomosis. Non operative management played a definite role in the cases presenting with post-operative adhesion causing intestinal obstruction especially during the first episode. Among the cases which were diagnosed with carcinoma colon, 35% of the cases underwent Hartmann's procedure. Palliative loop stoma creation was done for 23% of the patients. The rest of the patients underwent resection and anastomosis (42%).

The aim of this study was to highlight the increasing trend of malignant bowel obstruction, specifically colon cancer. This study found that 15% of the cases which presented to the hospital with acute intestinal obstruction was due to colon cancer and 7% of the cases was due to carcinoma rectum.

Table 7: Age group of different studies.

Age group	Adhikari[14]	Cole GJ[15]	Harban Singh[16]	Present study
12-19	9%	10%	10%	2%
20-29	11%	10%	16%	4%
30-39	15%	18%	18%	6%
40-49	24%	16%	15%	18%
50-59	13%	15%	10%	26%
60-69	20%	16%	20%	18%
70-79	8%	9%	5%	17%
80-89	4%	6%	4%	8%

Table 8: Symptoms of study group.

Study group	Pain abdomen	Vomiting	Distension	Constipation
Present study	100%	65%	70%	80%
Adhikari[14]	72%	91%	93%	82%
Jahangir Sarwar Khan[18]	100%	92%	97%	97%

The most consistent symptom among patients presenting with acute intestinal obstruction is obstipation followed by abdominal distension. All patients who presented to the hospital in this study came with complaints of abdominal pain. This is similar to a study conducted by Jahangir Sarwar et al where 100% of the cases had pain abdomen as a presenting complaint.18 Obstipation was a complaint in 80% of the patients in this study. This corroborates with the study finding by Khan et al (97%) as well as Adhikari et al 15 (82%). Unlike other studies, only about 70% of patients in present study came with vomiting or abdominal distension and only 35% were dehydrated on presentation. This could probably be due to the earlier presentation of the cases in this study before all features of acute intestinal obstruction develop. This is a favourable situation since the prognosis is better when the patients present earlier to the emergency department.

CONCLUSION

Acute intestinal obstruction is one of the most common emergencies presenting in the surgical casualty. This

study confirms that the age group of presentation of acute intestinal obstruction with various etiologies is reducing. The dietary habits most definitely play a crucial role in the pathogenesis as we shift towards a diet with lower fiber content and increased amount of carcinogenic substances. This study was primarily focused at highlighting the increased incidence of colon cancer in a tertiary center in Kerala which has been evident for the past few years. It is evident that there is a need for better screening and evaluation programmes specifically aimed at detecting colon cancer at early stages. This implies more frequent colonoscopic evaluation for the high-risk population. With improved education of physicians resulting in effective and appropriate implementation of screening colonoscopy guidelines, and with improved technology, equipment, and training, this preventable, lethal disease should be virtually eradicated.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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