

A Profile of Colorectal Tumors Presenting as Emergency

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ABSTRACT

Objective: To determine the factors, management and outcome of colorectal tumors presenting at Emergency Department, Mayo Hospital, Lahore.

Study Design: Observational study.

Place and Duration of Study: Accident & Emergency Department, Mayo Hospital, Lahore, from August 2017 to July 2019.

Methodology: Conducted on 40 consecutive patients who presented in the Accident and Emergency Department, Mayo Hospital, Lahore; determined to have colon or rectal cancer as the cause of intestinal obstruction or perforation, were studied. Data was abstracted from patient charts. Studied variables included patient's demographic data, indication for admission, surgical procedure done, complications, histopathology and mortality rate.

Results: Forty patients underwent operations of colon and rectum during the study period. Mean age at presentation was 37.8 ± 16.7 years. Intestinal obstruction (75%) was the main presenting symptom. Ascending colon was the main site involved (50%), followed by recto-sigmoid mass (15%) and rectal mass (12.5%); 80% patients subjected to the stoma formation. Electrolyte imbalance and wound infection were the most common medical and surgical complications. Adenocarcinoma was the most common tumor on histopathology (92.5%). After surgery 87.5% patients survived and 12.5% patients expired. Factors significantly associated with worse outcome were greater ASA score ($p=0.004$), absence of screening colonoscopy in the past ($p=0.013$) and postoperative medical complications ($p<0.001$).

Conclusion: Colorectal tumor cases continue to present in emergency in a high number. Male gender, young age and ascending colon cancers were more frequent among such cases. Most patients had to undergo stoma formation in emergency. Mortality is significantly associated with higher ASA score, absence of screening colonoscopy and postoperative medical complications.

Key Words: Colorectal carcinoma, Adenocarcinoma, Ascending colon, Wound infection, Emergency, Young males, Screening colonoscopy, ASA score.

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INTRODUCTION

Colorectal cancer is one of the most common cancers diagnosed annually by more than one million people worldwide.¹ Colorectal tumor is third most common cancer in men, the second most common cancer among women and the world's fourth common cause of death from cancer.² There is rise in cancer presentation at younger age in Asian population.³

Clinical problems are usually more complex in patients treated by emergency care than in patients diagnosed by outpatient elective consultations.¹ Patients present to emergency department with acute conditions, i.e. intestinal obstruction, bowel perforation, peritonitis or hemorrhage and require emergency surgery.^{1,4}

Perforation is a bad prognostic factor and most frequent postoperative complication is surgical site infection after colorectal resection.⁴ Malnutrition, dehydration and older age have been associated with poorer outcomes.⁴ Important factors influencing survival after emergency surgery include postoperative complications such as anastomotic leak, and other medical complications.⁵

There are higher postoperative complication and mortality rates with emergency surgery.² Ziou *et al.* suggested that treatment of cancer as an emergency is linked with a significantly poorer prognosis; nevertheless, this is an under-studied issue, with research investigating its occurrence and etiology restricted to a few developing countries.⁶ Tebala GD *et al.* demonstrated that two-stage treatment is correlated with lower mortality and higher levels of laparoscopic resection and adjuvant or neoadjuvant therapy, both favourable determinants of improved results.⁷

It would be helpful in presenting information that will support the implementation of strategies targeted at minimising the incidence of emergency cancer and enhancing the standard of treatment and cancer results. It is necessary to carry out such

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studies in local population in order to increase the understanding of screening programmes as colorectal tumors occur at a much younger age as well. The outcome of patients hospitalised following an emergency presentation, considering various causes, need to be studied in order to find ways to minimise potential emergency presentations.

The objective of this study was to determine the factors, management and outcome of colorectal tumors presenting at Emergency Department, Mayo Hospital, Lahore.

METHODOLOGY

An observational study of 40 consecutive patients was conducted retrospectively from August 2017 to July 2019, who presented in an Accident and Emergency Department, Mayo Hospital, Lahore. The analysis of this study was based on patient-level data extracted after approval from Institutional Review Board and Ethical Committee. A proforma was designed indicating all relative information to be abstracted from patient charts. Four post-graduate residents of Surgery Department collaborated as data abstractors; and were briefed before data abstraction. They were monitored during their process by one of the investigators of study; however, remaining blind to study outcome. A meeting was arranged between abstractors and investigators after a week to remove any confusion or ambiguity regarding data abstraction. Data sampling was done through convenience style using pre-determined two years duration. Those charts showing missing values in any of the variables were deleted from study. Patient charts examined and all those patients, whose record showed age more than 13 years, operated within 24 hours after presentation, had obstructive symptoms or signs of perforation/bleeding, absent bowel sounds and dilatation of the colon on plain X-ray abdomen, were included. In addition, those with subsequent peritonitis or intra-abdominal abscess and/or symptoms and signs of sepsis (fever, high white blood cell count, hemodynamic instability) and had active and enormous bleeding, were also included in this study. Exclusion criteria were tumor not completely obstructing the lumen of colon or rectum, positive bowel sounds, peristalsis present on ultrasound, any redo surgeries.

Patient's demographic data and risk factors including age, gender, family history of carcinoma, ASA score and any comorbid condition, were checked by looking into patient file records. Previous history of colonoscopy, surgical indication for admission, site of pathology, surgical procedure done, type of surgery, medical and complications, type of carcinoma on histopathology, histological grade, and length of stay in ward were also reviewed by looking into patient charts. Main outcome was death *versus* discharge rate of all those patients.

The statistical research were performed with the SPSS Version 26 software. The variables like age and length of stay in ward interpreted as means and standard deviations were recorded. The categorical data as gender, family history were represented as frequency and percentage. The comparison of categorical variables performed by Chi-square or the Exact Fisher

test where necessary, taking outcome (discharge vs. died) as dependent variable were also noted. Variables normally distributed like age and length of stay in ward were evaluated with the student t-test. The cutoff for significance were placed at p-value <0.05 and 95% confidence interval.

RESULTS

Forty (n=40) patients presented in emergency with colorectal carcinoma from August 2017 to July 2019, and met the inclusion criteria. There were 23 (57.5%) males and 17 (42.5%) females with mean age of 37.8 ± 16.7 (range = 14-80) years at presentation. The mean age of patients survived vs. died after surgery, i.e. (35.8 ± 14.7 vs. 52.0 ± 24.1 p=0.040) was significant. Other demographic variables are shown in Table I.

Table I: Frequency of patterns and patients' risk factors after presenting in emergency.

Patient variables	Results	Outcome p-value ≤ 0.05
Family history of carcinoma Yes No	9 (22.5%) 31 (77.5%)	0.065
ASA score Normal healthy person Patient with mild systemic disease Patient with severe systemic disease Patient with severe systemic disease that is a constant threat to life Moribund patient who is not expected to survive without the operation Brain dead patient	15 (37.5%) 8 (20%) 1 (2.5%) 0 0	0.004
Comorbid conditions None Diabetes mellitus Hypertension Ischemic heart disease Obesity Smoking Hypertension and ischemic heart disease Hypertension and smoking Alcohol and smoking Hypertension and Diabetes	15 (37.5%) 7 (17.5%) 2 (5%) 1 (2.5%) 3 (7.5%) 1 (2.5%) 5 (12.5%) 4 (10%) 1 (2.5%) 1 (2.5%)	0.252
Previous history of colonoscopy Yes No	2 (5%) 38 (95%)	0.013
Surgical indication for admission Intestinal obstruction Perforation with peritonitis Per rectal bleed	30 (75%) 9 (22.5%) 1 (2.5%)	0.915
Site of pathology Cecum Ascending colon (involving Hepatic Flexure) Transverse colon Descending colon (involving Splenic Flexure) Sigmoid colon Recto sigmoid V. Rectum	2 (5%) 20 (50%) 2 (5%) 2 (5%) 3 (7.5%) 6 (15%) 5 (12.5%)	0.456

Pre-op, intraoperative variables shown in Table II and postoperative complications and histopathology are shown in Table III. The mean length of stay in ward of patients with colorectal carcinoma was 14.4 ± 3.4 (range=9-23) days. The mean length of

stay in ward of patients 14.7 ± 3.5 vs. 12.6 ± 2.4 , $p=0.214$ was not significant. The total number of patients who were survived after surgery was 87.5% ($n=35$), while 12.5% ($n=5$) patients died after surgery. The dependent variable was outcome and main factors associated with poor outcome were greater ASA score ($p=0.004$), not having previous routine practice of colonoscopy ($p=0.013$), and postoperative medical complication after surgery ($p<0.001$).

Table II: Management of patients presenting with diagnosis of colorectal tumor in emergency department.

Variables	Frequency N (%)	p-value ≤ 0.05
Surgical procedure done		
Right hemicolectomy + Ileocolostomy	15 (37.5%)	0.489
Right hemicolectomy+ Ileocolic anastomosis	7 (17.5%)	
Extended Right Hemi Colectomy+ Ileocolostomy	2 (5%)	
Diversion Loop colostomy	10 (25%)	
Left Hemi Colectomy + Hartman's Procedure	6 (15%)	
Anastomosis/ stoma	32 (80%)	0.563
Anastomosis	08 (20%)	

Table III: Post-op complications and histopathology of patients presenting with diagnosis of colorectal tumors in emergency department.

Variables	Frequency n (%)	Outcome $p \leq 0.05$
Medical complications		
None	24 (60%)	<0.001
Electrolyte imbalance	10 (25%)	
Acute myocardial infarction	1 (2.5%)	
Arrhythmias	2 (5%)	
Chest infection	3 (7.5%)	
Surgical complications		
None	25 (62.5%)	0.489
Wound infection	9 (22.5%)	
Abscess	1 (2.5%)	
Anastomosis leak	1 (2.5%)	
Ileus	4 (10%)	
Type of carcinoma on histopathology		
Adenocarcinoma	37 (92.5%)	0.338
Lymphoma	3 (7.5%)	
Histological grade		
Well-differentiated AC	15 (37.5%)	0.367
Moderately differentiated AC	14 (35%)	
Poorly differentiated AC	8 (20%)	
Lymphoma	3 (7.5%)	

DISCUSSION

Colorectal cancer often causes emergencies related to the colon.⁸ Most notably, the colorectal cancers have been in the recto-sigmoid area, followed by the left and right colon. However, in the last few years the incidence of tumors in the proximal colon has increased.⁸ Malignant obstruction can occur in any part of the colon and rectum.⁹ Askari *et al.* demonstrated in their study, patients with colonic tumors were more likely to undergo emergency surgery relative to rectal tumors.¹⁰ Likewise, in the present study, the most common tumor site for

emergency presentation was the ascending colon (50%) i.e. part of colon, followed by recto sigmoid (15%) and rectum (12.5%).

Age is a major risk factor for colorectal tumors. About 90 per cent of patients with colorectal tumors are diagnosed after 50 years of age; and it is estimated to have peaked in the 7th decade.⁸ Statistically, age is an independent predictor of mortality in colorectal cancer emergencies.¹¹ However, Krstic *et al.* have shown a high incidence of recto sigmoid and rectal tumors in patients under 40 years of age.¹² In this study, the mean age of emergency patients was reported as 38 years showing a rising trend at younger age. Only 17.5% of patients with colorectal tumors were older than 50 years of age.

The most common symptoms in patients with colorectal tumors include pain in abdomen, vomiting, constipation, diarrhea, weakness, weight loss and rectal bleeding. Krstic *et al.* suggested that 20 percent of colorectal cancer cases are diagnosed during surgery due to obstruction of the large intestine.¹² Esteva *et al.* demonstrated that abdominal pain and obstruction are far more common in patients with colon than in patients with rectal cancer, that explains the higher percentage of emergency presentation and rectal bleeding is very less presentation.¹ This study also showed similar results, showing 75 % patients presented in emergency with signs of intestinal obstruction, being the most presentation symptom.

The treatment type depends on the location of the tumor and it is usually operation surgeon's choice. Bayar *et al.* suggested the most common treatment for right colon tumors was resection and primary anastomosis.⁸ However, in this study, in 80% cases stoma made after resection of diseased part of intestine mostly due to poor comorbidities of the patients.

Patients who undergo colorectal surgery are at increased risk for surgical site infections (SSI) and SSI rate increases 1.69 times for malignant tumors.⁸ However, it has been documented that rate dropped from 35.2% to 20% using a single dose of prophylactic antibiotic therapy.⁸ This study showed wound infection rate at around 23 % out of total cases.

The complications and advanced stage of disease intend to have long surgeries, increased rate of postoperative complications leading to a prolonged hospital stay of patients.^{13,14} In this study sample, the mean period of hospitalization was 14.40 ± 3.43 days. Similarly, regarding subtype of cancer, adenocarcinoma was commonest in this study 92.5% and results were similar to a study conducted by Patra *et al.* in Eastern India.¹⁵

Patients who undertake emergency operation for colorectal cancers are 10 times more likely to die within 30 days of surgery,¹¹ and colorectal emergencies are linked with substantial morbidity and mortality with poorer health-related quality of life afterwards.^{11,12,16} Controversy exists in literature reports about the effect of site of colorectal tumor on mortality,^{17,18} however; most studies document right sided colon cancers are associated with higher mortality rate than left sided colon cancers.^{19,20} In the present study, death rate after emergency

operation was 12.5% and out of them 7.5% had ascending colon and 5% at rectum.

Despite current recommendations for colorectal cancer screening, patients still present with some complications.³ Information from the National Cancer Intelligence Network (NCIN) showed that almost a quarter of patients with colorectal tumors are still diagnosed as emergency patients after screening.¹⁰ The National HS introduced National Bowel Cancer Screening System (NBCSP) in 2006 with the main objectives of early colorectal tumor detection and reduction for emergency admissions. There is evidence that a well-functioning screening system has the potential to reduce the rate of emergency admissions; however, in this study 95% of patient did not have history of screening colonoscopy in their lifetime, showing how serious screening issues are prevalent in resource less countries.

This research was one of its kind of pilot studies to demonstrate concern about the emergency presentation of colorectal tumors in the local population. There were some drawbacks in our research, such as a single institute research lack of long-term follow-up, but there is a troubling incidence of colorectal malignancies reported to the Emergency Department that could be avoided if appropriate screening procedure were to be followed. Difficulties in screening systems in Third World countries, such as Pakistan, need to be resolved in order to detect the carcinoma in a timely manner and that emergency presentations. Reducing emergency presentations would enable health services to be used more effectively and accurately, enhancing patient care experience and increasing survival for patients with cancer.

CONCLUSION

Colorectal tumors to present in emergency with varying degree of severity and outcome depend on multiple factors. Male gender, young age and ascending colon cancer had more frequency emergency presentation. Most patients had stoma formation as emergency operation. Main variables for evaluating bad outcomes following colorectal tumor surgery were higher ASA scores, lack of colonoscopy screening and postoperative medical complications.

ETHICAL APPROVAL:

Study was conducted after obtaining approval from the Institutional Review Board (SGR-18-21856).

PATIENTS' CONSENT:

Informed consents were obtained from all individual participants included in the study.

CONFLICT OF INTEREST:

Authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:

GA: Concept, design, interpretation, draft.

AS: Drafting work, critical analysis final approval.

SM: Accuracy, critical analysis, final approval.

BA: Critical analysis, accuracy.

AG: Data analysis, SPSS work, patient files.

KMG: Final approval, logistics, critical analysis.

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