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Original Research Article

Surgical outcomes of mechanical intestinal obstruction due to neoplasms at Moi Teaching and Referral Hospital, Eldoret, Kenya

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ABSTRACT

Background: Mechanical intestinal obstruction (IO)c due to neoplasms is associated with high morbidity and mortality rates worldwide. High rates of advanced stage cancers upon presentation in a resource-limited settings result in increased rates of IO, but the outcomes following surgical management are unknown. There was need to assess the surgical outcomes in our set up. Objective of the study was to assess the surgical outcomes of mechanical intestinal obstruction due to neoplasms in adults.
Methods: We conducted a prospective, mixed-methods study utilizing data forms and patient interviews. We enrolled patients through census sampling from January to December 2023. Categorical data was summarized as frequencies and their corresponding percentages while the numerical data was summarized as means and standard deviation. Bivariate analysis was used to determine variable associations.
Results: 59 patients were enrolled in the study, with an average age of 51 years and 64.4% being male. The tumor size (T) of T4 was the most common presentation (83%, n=49) with nodal involvement (77.9%, n=46) and metastatic (57.6%, n=34). The most common surgical intervention offered was creation of a diversion stoma (57.6%, n=34). The commonest postoperative complication was the surgical site infection (28.7%, n=29). The median length of hospital stay was 10 days. Moderately differentiated malignant neoplasms and large bowel obstruction were associated with higher risk of developing complications ($p<0.001$). The 30-day postoperative mortality rate was 10.8%.
Conclusions: Majority of the neoplasms causing acute mechanical intestinal obstruction in adults were large bowel adenocarcinomas presenting at advanced stages.

Keywords: Mechanical intestinal obstruction, Neoplasms, Surgical outcomes, Adults

INTRODUCTION

Intestinal obstruction (IO) is the failure of passage of the intestinal luminal contents. In mechanical or dynamic IO, the peristalsis is working against a physical obstruction.[1] Neoplasms contribute to a significant proportion of mechanical IO with a prevalence of 2-17% worldwide.[1-3] In Kenya, it is about 4.5%.[1] However, the rates of IO due to neoplasms have been shown to increase in the African continent over the last decade.[2] This is attributed to adoption of the western culture such as dietary changes which includes increase in fatty foods and alcohol intake, and excessive smoking. Other factors such as lack of exercise, limited access to health facilities, low uptake of cancer screening services, inadequate workforce and health facilities providing cancer related services and low community awareness levels on malignant neoplasms are associated with delayed diagnosis.[1,4]

Neoplasms are classified by location, whether in small versus large bowel. The small bowel obstruction involves segment of the bowel distal to pylorus of the stomach up

to the ileo-caecal junction while large bowel obstruction involves segment of the bowel from ileo-caecal junction to the rectum. It is predicted that large bowel, particularly the distal aspect, is more commonly affected by neoplasms as compared to small bowel due to slow transit time which exposes it to food and bacterial carcinogens. Within the small bowel, it has been found that the proximal part is more frequently affected.[5,6]

Adenocarcinomas are the most common primary histological subtypes affecting both large and small bowel. They contribute to more than 75% of the total cases. Other histological subtypes include: lymphomas such as the non-hodgkins lymphoma (NHL), neuroendocrine neoplasms, sarcomas, squamous cell carcinomas, gastrointestinal stromal tumors (GIST) among others.[6,7]

Intra-abdominal neoplasms may lead to mechanical obstruction either through extrinsic intestinal compression, endoluminal obstruction, intramural infiltration, or extensive mesenteric infiltration.[5] Patients will present with the cardinal signs and symptoms of intestinal obstruction such as the failure to pass stool and or flatus, abdominal pain and or distention, and vomiting. Additionally, they may have signs and symptoms depending on the location of the neoplasms and their metastatic site and substances secreted by the neoplasm such as rectal bleeding, anemia, diarrhea, respiratory complications among others. With prolonged obstruction, the patients develop bowel tissue ischemia which is associated with bowel infraction and perforation leading to development of peritonitis.[6]

Neoplasms causing complete mechanical IO have been demonstrated as a high-risk surgical emergency case because of their association with high morbidity and mortality rates. The treatment is individualized based on the patient factors such as physiological age, performance status, patient's wishes, presence of comorbidities; versus disease factors such as level of obstruction, number of occlusions i.e., single versus multiple, stage of the disease and aggressive nature of the malignancy. Surgery remains the mainstay treatment of choice to overcome the obstruction. There are various surgical options available depending on the extent of the neoplasms and associated complications. For localized neoplasms, resection and anastomosis is preferred to re-establish the continuity of the intestinal lumen. Other alternatives such as bypass surgery and stoma fashioning for stool diversion can be considered if the neoplasm is unresectable as part of palliative treatment. Additionally, these surgical options can be utilized single handedly or combined together to offer optimum treatment outcomes. Usually, the emergency operations offered to this group of intestinal obstructions are often performed within 24 hours of the patient's admission or within 24 hours of the development of a specific complication.[5,8]

The rate of post operative complications in acute mechanical IO due to neoplasms is high compared to surgeries due to other causes of intestinal obstruction. The rates are even higher in cases of the patients who are already diagnosed with intestinal malignant neoplasms and are undergoing cancer related treatment services. The rates of complications are influenced by several factors such as the patient's age, physical performance status, hemodynamic stability, stage of the neoplasms, tumor grade and level of contamination encountered during the surgery. The commonest post-surgery complications encountered in Low middle income countries include surgical site infections, electrolyte imbalance, persistent ileus >72 hours, anemia and stoma related complications. The development of complications is associated with longer length of hospital stay which translates to high cost of treatment due to longer duration of hospitalization. The mortality rates are also high compared to other causes of mechanical intestinal obstruction. Low middle income countries have higher rates compared to high income countries and this can be attributed to late stage of disease at presentation, inadequate cancer screening services and low uptake of such services by the surrounding communities, low awareness levels in among the healthcare workers and the general community, high cost of treatment, limited access to health facilities with capabilities of making such a diagnosis and delayed treatment.[2,3]

There is evidence that the cases of bowel tumors are on the rise with other types of malignancies locally and globally.[9,10] With the advancement of surgical oncology interventions, there is need quantify the true burden of the disease in order to derive the specific interventions geared towards minimizing their morbidity and mortality. Such data is limited in our set up. In this study we aimed at investigating the clinicopathological features, interventions offered and early treatment outcomes of neoplasms causing mechanical intestinal obstruction.

METHODS

The study was conducted at Moi Teaching and Referral Hospital which is a level 6 national referral hospital in Western Kenya from January to December 2023. It was a prospective observational study. All adult patients 18 years and older who underwent emergent laparotomy due to intestinal obstruction caused by malignancy were included in the study. Patients with prior history of malignancy prior to current admission and other causes of mechanical intestinal obstruction were excluded from the study. Modified Cochrane's formula was used to determine sample size based on previous hospital-based study of neoplasms causing mechanical intestinal obstruction at 11%. Patients were recruited into the study postoperatively while in the wards recovering. Chart review and patient interviews using a questionnaire were done using a research assistant. A follow up at day 15 and 30 postoperative day was done to determine complications encountered including 30-day

postoperative mortality rate. The data was analyzed using SPSS soft version 22.0 and R tool. Categorical variables were summarized as frequencies and their associated percentages while the numerical variables were summarized as means and their corresponding standard deviations. Fisher's exact test was used to check for associations between categorical variables while t-test/Mann Whitney U test were used to compare the numerical variables. The study findings were presented using figures, tables, and graphs. All the test results were considered statistically significant if p value was less than 0.05.

RESULTS

The study included a total of 59 adult patients aged 21 to 83 years that were diagnosed with mechanical intestinal obstruction due to neoplasms. Majority of the study participants were males comprising of 64.4% (n=38) compared to females 35.6% (n=21), with a mean age of 51.4±18.1 years as depicted in the Table 1.

The most common complaints included: Constipation (96.6%), abdominal pain (94.9%) and vomiting (79.7%) and signs were abdominal distention (67.8%), weight loss (27.1%), and rectal bleeding (15.3%) as summarized in Table 2.

In 43 of the study participants (72.9%), the tumor affected the large bowel causing the mechanical intestinal obstruction compared to 16 (27.1%) which caused small bowel obstruction. In large bowel obstruction, the most common sites affected by the tumor were the rectum (37.2%, n=16), sigmoid colon (27.9%, n=12) and the caecum (13.9%, n=6). The proximal ileum was the most common site of small bowel obstruction by the neoplasm (43.7%, n=7) followed by the duodenum (37.5%, n=6). Table 3 below summarizes the anatomical sites affected by the tumor causing mechanical intestinal obstruction.

Apart from a mass, other physical findings noted during the laparotomy were bowel ischemia (16.9%, n=10), adhesions 8.5% (n=5), ascites 6.8% (n=4), luminal narrowing (3.4%, n=2), and peritoneal seeding (1.7%, n=1) (Table 4).

Adenocarcinomas were the most common histological diagnoses for tumors that caused both small and large bowel mechanical intestinal obstruction accounting for 83.1% (n=49) of the total cases. It was followed by NHL (6.8%, n=4), and neuroendocrine tumors (4.7%, n=2). Other lesser variants diagnosed were the benign chronic inflammatory condition (3.4%, n=2), squamous cell carcinoma (1.7%, n=1), and intra-abdominal sarcomas (1.7%, n=1).

Table 1: Demographic characteristics of patients with mechanical intestinal obstruction due to neoplasms.

	Small bowel (%)	Large bowel (%)	Total (%)	P value
Characteristics	**n=16**	**n=43**	**n=59**	
Gender				0.67
Male	11 (68.8)	27 (62.8)	38 (64.4)	
Female	5 (31.3)	16 (37.2)	21 (35.6)	
Age in years				
Mean (SD)	48.2 (19.4)	52.6 (17.8)	51.4 (18.1)	0.42
Range	21–76	23–83	21–83	
Marital status				0.042
Married	11 (68.8)	32 (74.4)	43 (72.9)	
Single	5 (31.3)	4 (9.3)	9 (15.3)	
Widow	0 (0.0)	7 (16.3)	7 (11.9)	

Table 2: Presenting symptoms of mechanical intestinal obstruction due to neoplasms.

Presenting complaints	Small bowel (%)	Large bowel (%)	Total (%)	P value
	n=16	**n=43**	**n=59**	
Vomiting	15 (93.8)	32 (74.4)	47 (79.7)	0.10
Abdominal pain	15 (93.8)	41 (95.3)	56 (94.9)	0.80
Abdominal distention	8 (50.0)	32 (74.4)	40 (67.8)	0.074
Constipation	14 (87.5)	43 (100.0)	57 (96.6)	0.018
Easy fatigability	2 (12.5)	0 (0.0)	2 (3.4)	0.018
Weight loss	4 (25.0)	12 (27.9)	16 (27.1)	0.82
Yellowness of eyes	2 (12.5)	0 (0.0)	2 (3.4)	0.018
Rectal bleeding	0 (0.0)	9 (20.9)	9 (15.3)	0.047

Table 3: Anatomical location of neoplasms causing mechanical intestinal obstruction.

	N (%)	N (%)
Location of mechanical intestinal obstruction	Small bowel 16 (27.1)	Proximal ileum 7 (43.7)
		Duodenum 6 (37.5)
		Jejuno-ileum 3 (18.8)
	Large bowel 43 (72.9)	Rectum 16 (37.2)
		Sigmoid colon 12 (27.9)
		Caecum 6 (13.9)
		Ascending colon 3 (7.0)
		Descending colon 3 (7.0)
		Transverse colon 2 (4.6)
		Rectosigmoid 1 (2.3)

Table 4: Other intraoperative findings of mechanical intestinal obstruction due to neoplasms.

Intra-op findings	Small bowel (%) n=16	Large bowel (%) n=43	Total (%) n=59	P value
Bowel ischemia	2 (12.5)	8 (18.6)	10 (16.9)	0.58
Adhesions	1 (6.3)	4 (9.3)	5 (8.5)	0.71
Ascites	2 (12.5)	2 (4.7)	4 (6.8)	0.29
Luminal narrowing	2 (12.5)	0 (0.0)	2 (3.4)	0.018
Peritoneal seeding	0 (0.0)	1 (2.3)	1 (1.7)	0.54

Table 5: Pathologic features of neoplasms causing mechanical intestinal obstruction.

Variable	Small bowel (%) n=16	Large bowel (%) n=43	Total (%) n=59	P value
Histological type				0.23
Adenocarcinoma	12 (75.0)	37 (86.0)	49 (83.1)	
Non-Hodgkin Lymphoma	3 (18.8)	1 (2.3)	4 (6.8)	
Sarcoma	0 (0.0)	1 (2.3)	1 (1.7)	
Squamous cell carcinoma	0 (0.0)	1 (2.3)	1 (1.7)	
Chronic inflammatory process	1 (6.3)	1 (2.3)	2 (3.4)	
Neuroendocrine tumor	0 (0.0)	2 (4.7)	2 (3.4)	
Grade				0.77
1	3 (18.8)	5 (11.6)	8 (13.6)	
2	8 (50.0)	27 (62.8)	35 (59.3)	
3	2 (12.5)	3 (7.0)	5 (8.5)	
N/A	1 (6.3)	1 (2.3)	2 (3.4)	
Unspecified	2 (12.5)	7 (16.3)	9 (15.3)	

Table 6: Clinical staging of neoplasms causing mechanical intestinal obstruction.

Variable	Small bowel (%) n=16	Large bowel (%) n=43	Total (%) n=59	P value
Tumor size				0.069
T2	2 (12.5)	2 (4.7)	4 (6.8)	
T3	3 (18.8)	9 (20.9)	12 (20.3)	
T4	7 (43.8)	30 (69.8)	37 (62.7)	
N/A	4 (25.0)	2 (4.7)	6 (10.2)	
Nodal involvement				0.065
N0	3 (18.8)	4 (9.3)	7 (11.9)	
N1	2 (12.5)	12 (27.9)	14 (23.7)	
N2	7 (43.8)	25 (58.1)	32 (54.2)	
N/A	4 (25.0)	2 (4.7)	6 (10.2)	

Continued.

Variable	Small bowel (%)	Large bowel (%)	Total (%)	P value
Metastasis				0.11
M0	4 (25.0)	12 (27.9)	16 (27.1)	
M1	8 (50.0)	26 (60.5)	34 (57.6)	
Mx	0 (0.0)	3 (7.0)	3 (5.1)	
N/A	4 (25.0)	2 (4.7)	6 (10.2)	

Table 7: Surgical interventions offered for mechanical intestinal obstruction due to neoplasms.

Surgical intervention offered	Small bowel (%)	Large bowel (%)	Total (%)	P value
	n=16	n=43	n=59	
Diversion stoma	3 (18.8)	31 (72.1)	34 (57.6)	<0.001
Resection and anastomosis	8 (50.0)	18 (41.9)	26 (44.1)	0.58
Bypass	10 (62.5)	4 (9.3)	14 (23.7)	<0.001

Table 8: Early treatment outcomes of mechanical intestinal obstruction due to neoplasms.

Variables	Small bowel (%)	Large bowel (%)	Total (%)
	n=16	n=43	n=59
Complications			
No	5 (31.3)	14 (32.6)	19 (32.2)
Yes	11 (68.8)	29 (67.4)	40 (67.8)
Specific complication			
Fevers	3 (27.3)	6 (20.7)	9 (22.5)
Electrolyte imbalance	10 (90.9)	14 (48.3)	24 (60.0)
Persistent ileus	9 (81.8)	11 (37.9)	20 (50.0)
Surgical site infection	9 (81.8)	20 (69.0)	29 (72.5)
Anemia	1 (9.1)	8 (27.6)	9 (22.5)
Early bowel obstruction	0 (0.0)	2 (6.9)	2 (5.0)
Gangrenous Stoma	0 (0.0)	1 (3.4)	1 (2.5)
Stoma retraction	1 (9.1)	1 (3.4)	2 (4.9)
Stoma prolapse	0 (0.0)	5 (17.2)	5 (12.2)
Length of hospital stay in days			
Median (IQR)	8.0 (5.5-10.0)	12.0 (6.0-15.0)	10.0 (6.0-14.0)
Range	4 – 40	4 – 35	4 – 40
30-day mortality rates	3 (15%)	4(8.9 %)	7 (10.8%)

Table 9: Correlation of clinical features and early treatment complication rates.

Variables	Complications			
	No (%)	Yes (%)	Total (%)	P value
	n=19	n=40	n=59	
Age in years	55.4 (20.5)	49.5 (16.9)	51.4 (18.1)	0.241[3]
Gender				0.472[1]
Male	11 (28.9)	27 (71.1)	38 (100.0)	
Female	8 (38.1)	13 (61.9)	21 (100.0)	
Site of obstruction				0.924[1]
Small bowel	5 (31.3)	11 (68.8)	16 (100.0)	
Large bowel	14 (32.6)	29 (67.4)	43 (100.0)	
Length of hospital stay	5.0 (5.0-6.0)	12.0 (10.0-15.5)	10.0 (6.0-14.0)	<0.001[4]
Grade				
1	1 (12.5)	4 (87.5)	8	0.003[2]
2	10 (28.6)	25 (71.4)	35	
3	5 (100.0)	0	5	

[1]Chi Square test, [2]Fisher's exact test, [3]test, [4]Mann Whitney U test.

Majority of the malignant neoplasms affecting small and large bowel were moderately differentiated neoplasms accounting for 59.3% (n=35) of the total cases. Grades 1 and 3 contributed to 13.6% (n=8) and 8.5% (n=5) of the total cases respectively. The tumor grade was not specified in 15.3% (n=9) of the sample specimens for histological evaluation and in 3.4% (n=2), the grading was not applied because they were benign conditions as depicted in Table 5.

Cumulatively T4 tumors was the commonest tumor size for both small and large bowel neoplasms accounting for 62.7% (n=37) of the total cases followed by T3 tumors (20.3%, n=12) and T2 tumors (6.8%, n=4). None of the study participants had T1/T0 tumors. In terms of nodal involvement, 46 (77.9%) of the study participants had their nodes involved by the malignant neoplasms for the small and large bowel neoplasms. In 57.6% (n=34) of the patients' bowel obstruction had distant metastases at diagnosis. In 3 patients their metastatic work up could not be assessed due to unavailability of the staging work up. In 6 patients, the AJCC/UICC TNM staging system could not be applied as they had chronic inflammatory conditions and lymphomas as summarized in Table 6.

The most common surgical intervention offered was for both small and large bowel obstruction was creation of a diversion stoma accounting for 57.6% (n=34), followed by resection and anastomoses and lastly bypass accounting for 44.1% (n=26) and 23.7% (n=14) respectively as summarized in Table 7.

The most common complications encountered after surgery in these patients were the infection involving the surgery site (72.5%, n=29), electrolyte imbalance (60%, n=24) and persistent ileus >72 hours (50%, n=20). The length of hospital stay ranged from 4 to 40 days with a median of 10 days for all study participants. The 30-day postoperative mortality rate was 10.8% (n=7) for both small and large bowel obstructions due to neoplasms. Three of the patients died while they were at the hospital due to septicemia while 4 died while recuperating at home due to unknown reasons (Table 8).

The study participants who developed post-surgery complications were associated with longer hospital stays of average 12 vs 5 days as compared to those who did not develop complications which was statistically significant ($p<0.001$). Study participants with moderately differentiated malignant neoplasms had higher chances of developing complications compared to other grades ($p=0.003$). The other correlations were not significant as shown in the Table 9.

DISCUSSION

The neoplasms causing mechanical intestinal obstruction necessitating surgical intervention are among the commonest causes of hospital visit to the emergency department. Patients with different demographic characteristics are usually encountered while seeking care. In Kenya, Ghana and Germany most patients affected are in their 5th-6th decade of life.[2,11,12] With the increasing cases of malignancies being diagnosed every year, there is a noticeable downward shift in the age.[13]

Majority of the neoplasms causing mechanical intestinal obstruction presented similarly. This is comparison with a study done by Markogiannakis et al which showed that patients who had small and large bowel obstructions due to malignancies presented the same with abdominal pain, vomiting, abdominal tenderness and distention. Other findings such as rectal bleeding and jaundice could indicate large bowel and small bowel neoplasms respectively but these signs and symptoms are not specific as they can overlap and therefore lack specificity.[6,8]

The large bowel was more commonly affected compared to small bowel obstruction**.** Similar findings were found in studies done in Kenya, Somalia, Greece and Germany.[3,6,7,14] These findings reinforce what is already known that the large bowel is more commonly affected by neoplasms due to delayed transit time of luminal contents in large bowel allowing for long exposure to carcinogens, and presence of micro bacteria in large colon that produce carcinogens that promote cancer development.

Left colon distal to splenic flexure was the most common affected part of large bowel.[3,14] This is because the left colon is narrower compared to the right hence can easily obstruct given the reduced bowel diameter. In small bowel obstruction, the proximal ileum was the most affected part. This is because the proximal ileum is more perfused with blood supply than the other parts of the small bowel.[15]

The most common malignant neoplasms comprised of adenocarcinomas which were moderately differentiated followed by Non-Hodgkin's lymphoma and neuroendocrine tumors. This is comparable with studies done which demonstrated that most neoplasms that occurred in small and large bowel were the adenocarcinomas followed by lymphomas especially the Non-Hodgkin's Lymphoma.[8,16] In West Africa similar findings were obtained by Irabor & Adedeji in which adenocarcinomas were the most common cancer diagnosis of the large bowel.[17] For neoplasms causing small bowel obstruction, adenocarcinomas located in proximal bowel were the most common closely followed by lymphomas due to associated gut lymphoid tissue. Contrast to our study findings, neuroendocrine tumors were more common cause of small bowel malignancies in the US followed closely by adenocarcinomas.[18] Tumor biology and geographical location differences could have played a role in the difference.

Apart from a mass causing the obstruction, other intraoperative findings were obtained which included

adhesions, ascites, ischemic bowel, luminal narrowing and peritoneal seeding. These features point towards advanced disease status at presentation. Similar findings were obtained by Adhikari et al and Kube et al where features of advanced disease at the time of surgery which indicated poor prognosis.[12,19,20]

Most of the malignant bowel neoplasms diagnosed were at advanced stage. This was evidenced by both T3 and T4 tumors being the commonest tumor size at presentation with nodal involvement and in the metastatic setting. This is comparable to studies done by Saidi et al in Kenya and Etissa et al in Ethiopia. Delay in seeking care until when the patient is symptomatic, invasiveness of colon cancer screening and lack of screening test for small bowel malignancies have been attributed to the general late presentation for large and small bowel malignancies in LMIC leading to poor treatment.[11,21] However, this is contrast in the western population especially in the US where most intestinal tumors are diagnosed early and have good treatment outcomes compared to our setup. Tumor biology and access to early diagnosis and treatment services may have been attributed as the influencing factors in terms of treatment outcomes.[22]

The most common surgical intervention offered intraoperatively for small bowel obstruction due to neoplasms compared to large bowel obstruction were the resection and anastomosis and bypass surgery. For large bowel obstruction creation of a diversion stoma was performed more commonly than in small bowel obstruction. In India and United Kingdom primary resection and anastomosis and bypass surgeries were more common in small bowel obstruction by neoplasms.[20,23] For large bowel obstruction by neoplasms, fecal diversion was the most common performed surgical intervention in patients with advanced large bowel malignancies.[3] The difference in the interventions offered for small and large bowel obstructions by neoplasms was the ease of performance of the procedure given the disease is already advanced at the time of presentation due to the ability to cause bowel obstruction by intraluminal occlusion or extraluminal compression. In both small and large bowel obstruction due to neoplasms, the bowel resection and anastomosis, bypass surgery and fecal diversion through a stoma were the commonest procedures performed in the emergency setting.[3,19,24]

Majority of the study participants experienced complications during the postoperative period. The most common complications for both small and large bowel obstruction surgeries were the surgical site infection, electrolyte imbalance and persistent ileus. Similar complications were seen in studies done by Simachew et al and Yu et al in Ethiopia and China respectively.[19,25] This is because the patients with advanced malignancies tend to have low immunity due to the disease process or disease directed treatment therapy that predisposes them to develop complications and have longer duration of hospital stays. However, the cause of complications is multifactorial.

The 30-day postoperative mortality rate for small and large bowel obstruction due to neoplasms was 10.8% comparable to other countries like US which is 14.5%.[26] The patients with advanced neoplasms causing mechanical bowel obstruction tend to have higher mortality rates when compared to general population. This is attributed to development of higher complication rates, poor nutrition and physical performance status and weakened immunity.[19,20] Septicemia was the major contributory factor for the inpatient mortality. Other commonest causes of mortality in this category of patients globally include renal failure and respiratory failure.[6,27]

The patients with large bowel obstruction due to moderately differentiated neoplasm were more likely to develop complications which were associated with longer duration of hospitalization. In studies done in Kenya, Uganda, and Ethiopia, share similar sentiments in which large bowel neoplasms causing intestinal obstruction were moderately differentiated neoplasms and were associated with higher complication rates causing longer duration of hospital stay of 10-15 days.[11,21,28,29]

This study had limitations. It utilized reported and documented secondary information from the study participants' medical records to obtain the intraoperative findings during the surgery. This dependency on secondary information could have introduced reporting bias. The potential confounding variables such as comorbidities (i.e., diabetes mellitus, hypertension, HIV and other comorbidities) that influences treatment outcomes were not assessed. Most of this information was not captured in the participants medical records and since this was an observational study, an intervention to determine their findings could not be made. The sample size included in the study was small to generalize the data since the participants were recruited from one tertiary institution. A larger multicenter study with bigger sample population size is recommended to validate this study findings.

CONCLUSION

In conclusion the majority of the neoplasms causing acute mechanical intestinal obstruction in adults at MTRH were large bowel adenocarcinomas presenting at advanced stages and were associated with high post-surgery complication rates. Therefore, it is recommended that There is need to sensitize the surgeons and the community on neoplasms causing mechanical intestinal obstruction in order to downstage the disease at presentation and improve early treatment outcomes in our set up.

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