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# Clinicopathological Pattern and Treatment Outcomes of Acute Bowel Obstruction at a Rural Kenyan Hospital

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## Abstract

**Introduction:** Acute intestinal obstruction is a leading cause of emergency surgical admissions worldwide. The pattern of clinical presentation, pathology and outcome of intestinal obstruction vary with geographical location even within the same country. The aim of this study was to identify the clinico-pathological pattern and treatment outcomes of patients with acute mechanical and functional intestinal obstruction managed at Nyeri county referral hospital in central Kenya between 2008 and 2013.

**Methods and Materials:** A five-year retrospective review of all patients' charts admitted and managed for acute mechanical and functional intestinal obstruction at Nyeri county referral hospital in central Kenya. Data for demographic profiles, clinical presentation, investigations, diagnosis, treatment and complications were recorded in predesigned questionnaires. The original and duplicate databases were entered into Excel then compared for consistency and updated using standardized approach. After cleaning, the datasets were then exported to SPSS Version 20 for analysis.

**Results:** A total of 343 patients' charts were analysed. The mean age was 38 years. The male: female ratio was 2.5:1. Abdominal pain was commonest complaint. The average duration of symptoms at presentation was four days. Adhesive intestinal obstruction was the commonest cause of symptoms in 44.7%, followed by acute appendicitis in 19.2%, perforated gastric/duodenal ulcers in 14.9%, volvulus in 13.8% and external hernias in 7.3% of the patients. The mean duration of hospital stay was five days and the overall mortality rate was 14.4%.

**Conclusion:** Post-operative adhesive small bowel obstruction is currently the leading cause of intestinal obstruction at Nyeri county referral Hospital.

**Keywords:** Acute Abdomen Intestinal Obstruction

## Introduction

Acute bowel obstruction is a leading causes of emergency surgical admissions worldwide [1-3]. It's a significant cause of morbidity and mortality, especially when associated with complications such as bowel gangrene or perforation [4-7]. While the main causes of intestinal obstruction are largely similar, the patterns tend to have geographical variation even within same countries [2,6,7]. Data of the local disease patterns is extremely useful in clinical settings with limited diagnostic modalities where diagnosis heavily relies on clinical acumen or experience of the clinician [2,7,8]. Therefore, knowledge of patterns of common surgical disease like acute bowel obstruction, would improve surgical outcome by creating high index of suspicion thence early diagnosis and appropriate timely surgical intervention or referral [6-9]. This study aimed to determine the clinico-pathological pattern and treatment outcomes of patients with acute mechanical and functional intestinal obstruction managed at Nyeri county referral hospital in central Kenya. It also augments the existing body of knowledge on local surgical disease burden which is important in public health policy formulation to inform appropriate interventions intended to improve health outcomes [5].

## Methods and Materials

This was a retrospective cross-sectional analytical study conducted at the Nyeri county referral hospital during January 2008 to December 2013 period. Charts of all patients who were admitted with acute mechanical and/or functional bowel obstructive symptoms during the study period were reviewed. Data for demographic profiles, clinical presentation, investigations, diagnosis, treatment and outcomes were recorded in predesigned questionnaires. Charts with incomplete records were excluded. The original and duplicate databases were entered into Excel then compared for consistency and updated using standardized approach. After cleaning, the datasets were then exported to SPSS Version 20 for analysis. The significance of any differences was assessed using a Fisher´s exact test or student's t-test where appropriate. P-values less than or equal to 0.05 were accepted as significant. The main outcomes of interest were duration of hospital stay, post-operative complications and surgical morbidity/ mortality.

## Ethical Consideration

The study was approved by the Research and Ethics Committee (REC Ref No 2019/REC-94(v1). All data were identified and unique study codes were assigned to each record.

## Results

A total of 343 charts met the inclusion criteria and were analysed. The mean age was 38 years with males being affected two and half times more than female counterparts. The peak incidence was noted in the 31-40 years age bracket. The mean duration of symptoms was four days with the majority (59.2%) of patients reporting symptoms for more than four days. The most common signs and symptoms were abdominal pain (94.7%), abdominal tenderness (88.6%), vomiting (79%), abdominal distension (75.4%), constipation (60.8%), and peritonitis (50.3%). History of prior laparotomy was noted in (75.4%) cases. A plain abdominal radiograph was done in all patients who presented with abdominal pain. Commonest findings noted on plain abdominal were small bowel distension with multiple air fluid levels (66%), and large bowel distension (47.4%). The top five causes of acute bowel obstruction were adhesive bowel disease (44.7%), acute appendicitis (19.2%) perforated gastric/duodenal ulcers (14.9%), sigmoid volvulus (13.8%), obstructed external herniae 7.3%. Obstructing large bowel tumours were rare constituting a paltry 1.1%. Overall, the mortality rate at discharge was 14.4% and the average duration of hospitalization was 5 days. A total of 329 patients underwent laparotomy. Bowel gangrene was noted in (37%) cases. Sigmoid/small bowel volvulus and ileo-sigmoid knotting accounted for 74% of all cases of bowel gangrene. The main operative procedures performed included adhesiolysis (42%), resection and anastomosis (39%), appendectomy (19.2%), Graham's patch repair (14.9%), detortion and decompression. Post-operative complications were reported in 32% of patients distributed as follows: surgical site infections, fascial dehiscence, and intra-abdominal collections and enterocutaneous fistula. Forty-nine mortalities were noted during the admission period, comprising a postoperative mortality rate of 14.4%. Compared to patients with viable bowel at laparotomy, those with gangrenous bowel had a statistically significant higher morbidity/mortality rates and longer hospital stay.

## Discussion

Acute mechanical and /or functional bowel obstruction is a common surgical emergency whose adequate management and satisfactory outcome is determined by swift diagnosis and timely appropriate surgical intervention [5,9-13]. In this audit, the mean patient age was 38 years with a male predominance (68.1%). This mirrors findings from published literature regionally that documented mean ages between 32 and 45 years with male predominance rates of between 60 to 77% [4,6-8,10,14,15].

However, there are notable regional variations in the etiological pattern of bowel obstruction across these African studies. In two Nigerian reviews, strangulated/incarcerated hernias and adhesive bowel disease accounted for 54-90% [7,15], similar results were reported by Georges et al. and El Bushra et al. in Rwanda and Sudan respectively [6,16]. Conversely, in Ethiopia 55-74% of all cases of bowel obstruction were caused by small/large bowel volvulus [1,14]. Locally, previous study at same centre in central Kenya between 1992 and 1999 by Muyembe et al. reported sigmoid volvulus, as the leading cause of bowel obstruction followed by external herniae, post-operative adhesions, ileocolic intussusception and small bowel volvulus respectively [5]. Another local study at Kisii level 5 hospital in western Kenya by Bahaty et al revealed similar aetiological pattern [17]. However, Kuremu et al in a review of 263 patients with acute bowel obstruction at a tertiary referral hospital in western Kenya noted post-operative adhesive bowel disease as the principle aetiology, accounting for 44% of all cases [18]. This is similar to findings of our current study. Reasons for this aetiological variation with time and geographic locations is not clear. Obstructed/strangulated external hernias were rarely seen in this series (7.3%) compared to prior reported Kenyan series (18%). This may be due to the predominant elective repair of symptomatic hernias at most hospitals by medical officers and surgeons [10]. Bowel Neoplasms were uncommon cause of acute bowel obstruction in this audit just like findings from most regional review [8,10,15,16,19].

The overall mortality rate of 14.4% noted in this study is within range of other published African series 6.7-20% [6,10,14,20,21]. Significant predictors of mortality were delayed presentation/intervention, inadequate peri-operative fluid resuscitation and bowel gangrene. These findings support the clarion call of maintaining high index of suspicion based on local clinicopathological pattern, timely surgical intervention, and appropriate early referral based on available surgical capabilities and facilities. The risk of bowel gangrene with subsequent poor surgical outcome in mechanical bowel obstruction especially colonic volvulus with delayed presentation, diagnosis or intervention has been reported to be in the range of 80-100% [1,3,21]. In this audit, incidence of bowel gangrene was 84.8% contributing to subsequent longer hospital stay, higher rates of morbidity and mortality. Study limitation were small sample size and lack of heterogeneity of study population in terms of race or ethnicity.

## Conclusion

The top five causes of acute mechanical and functional bowel obstruction were adhesive bowel disease (44.7%), acute appendicitis (19.2%) perforated gastric/duodenal ulcers (14.9%), sigmoid volvulus (13.8%), obstructed external herniae (7.3%). Presence of bowel gangrene at laparotomy was associated with longer hospital stay and poorer surgical outcomes. However higher index of suspicion based on local clinico-pathological data, peri-operative optimization of fluid resuscitation and early appropriate surgical intervention can significantly improve surgical outcomes.

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