

Acute Mechanical Bowel Obstruction among Adults Seen at the Ladoke Akintola University of Technology Teaching Hospital in Nigeria.

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Background: Acute mechanical bowel obstruction (AMBO) is one of the common life threatening emergencies globally. This study was aimed at determining the pattern of causes of acute mechanical bowel obstruction in adult seen at the Ladoke Akintola University of Technology Teaching Hospital, Osogbo.

Methods: This was a prospective study of all adult patients with clinical, radiological and intra-operative features of acute mechanical bowel obstruction between June 2007 and June 2014, in the Ladoke Akintola University of Technology Teaching Hospital, Osogbo.

Results: A total of 126 adult patients with the diagnosis of acute mechanical bowel obstruction were enrolled in the study. The patients' ages ranged between 15 and 87 with a mean of 44.5 ± 2.1 (SD) years. The male to female sex ratio was 1: 1. Adhesions and bands accounted for 81 (64.3%) of the cases. Obstructed /strangulated hernia were responsible for 20 (15.9%) of the patients. Other causes included volvulus in 25 (19.8%), bowel tumors (6.3%), anastomotic strictures (5.6%), anastomotic strictures (3.2%), intussusceptions (3.2%) and faecal impaction (1.6%). The overall mortality was 10.3%.

Conclusion: Post-operative adhesion is the most common cause of acute mechanical intestinal obstruction with majority of these resolving on conservative management. The reduced incidence of obstructed/ strangulated external hernia in our environment is perhaps due to increased patients' awareness with many patients now presenting in the outpatient clinic with uncomplicated hernia.

Key words: Current pattern, Aetiology, Mechanical bowel obstruction.

Introduction

In many resource poor countries of the world, acute abdominal emergencies cause significant mortality^{1,2} Acute intestinal obstruction, which accounts for about 15 percent of all emergency department visits for acute abdominal pain, is one of the wide varieties of abdominal pathologies responsible for these deaths.¹ The causes of acute small bowel obstruction have changed dramatically during the past century.³ At the turn of the 20th century, hernias accounted for more than half of the cases of mechanical intestinal obstructions. With a notable increase in routine elective repair of hernias, this aetiology has dropped to the third most common cause of small bowel obstruction in industrialized countries.^{3,4}

The diagnosis of intestinal obstruction is not always easy and the indications for surgery needs high index of suspicion. Detailed history and thorough clinical examination are helpful in making a diagnosis and planning treatment. Classically there are four cardinal features, i.e. colicky abdominal pain, abdominal distension, projectile vomiting and constipation, but the prominence of each of these is affected by the site and type of obstruction.^{3,5,6} The exact cause of obstruction and the facilities available for treatment are known to influence the outcome.¹ This study was carried out to determine the current pattern of aetiology of acute mechanical intestinal obstruction in adults.

Patients and Methods

This is a prospective study of all adult patients who were admitted and managed for acute mechanical bowel obstruction (AMBO) from June 2007 to June 2014, at the Ladoké Akintola University of Technology Teaching Hospital (LTH), Osogbo, Osun State, South-Western Nigeria. Patients with paralytic ileus and those below the age of 15 years were excluded from the study.⁷ The hospital number, age and sex of each patient were recorded on a specially prepared chart. The onset, duration, and main symptoms of obstruction, as well as the past medical/ surgical history were recorded. Findings on abdominal radiographs and later at operation (for those operated) confirmed the diagnosis¹.

Patients with AMBO from postoperative adhesion were managed conservatively and those who failed to resolve within 72 hours were offered operative management. However patients with associated features of peritonitis or patients who developed features suggestive of gangrenous bowel within this period had operative management after initial resuscitation.⁷ The interval between presentation and operation was also recorded. Surgery was defined as emergency if carried out within 48 hours of admission.¹ Intraoperative findings were recorded which included the site and primary cause of obstruction with the operative procedure performed to relieve the obstruction. All deaths were recorded and mortality in this study was taken as deaths occurring during the same hospital admission.^{1,5} This study was approved by Research Ethics Committee of LTH, Osogbo and written informed consent was also obtained from each patient before being enrolled into the study. The data were recorded on a proforma sheet of individual patient and analysis was done using Statistical Package for Social Sciences (SPSS) version-16.

Results

During the seven years of this study, a total of 126 patients with AMBO were admitted and managed. The mean age was 44.5 ± 2.1 (SD) with a range of 15 to 87 years. The modal age group was 15 – 30 years accounting for 31.0% of cases and seventy-four (58.8%) of all cases were aged 45 years and below. Males constituted 50.8% (n = 64) of the study population. Table 1 summarizes the characteristics and presentation of the study population. Adhesion was the most common cause of AMBO, constituting 64.3% (n = 81) with a majority of them being post-operative 97.5% (n = 78). Out of the patients with postoperative adhesive MBO 71.8 percent (n = 56) patients had previously undergone only one abdominal surgery. In most of the patients, 70.5 percent (n = 55), with adhesive AMBO, the obstruction resolved with conservative management, while others had surgery ranging from adhesiolysis to resection of the bowel followed by end-to-end anastomosis.

The site of obstruction was found to be in the small intestine in all the cases of adhesive AMBO that were operated. Out of the three patients with primary adhesive AMBO found at laparotomy, one was due to recurrent pelvic inflammatory disease (PID) and the second was congenital band. The third case was due to abdominal tuberculosis in a man who was diagnosed with the human immunodeficiency virus (HIV) infection during the same admission. Table 2 summarizes the aetiology of AMBO. There were twenty patients with obstructed / strangulated hernias with inguinal hernia constituting 75% (n = 15) of them. Inguinal hernia was more common on the right, 60% (n = 9) and majority of them 73.3% (n = 11) were funicular type while the others were complete (inguino-scrotal). Ten percent (n = 2) of AMBO from obstructed hernia were due to strangulated peri-umbilical hernia, 10% were due to femoral hernias and 5% (n = 1) due to giant spigelian hernia. The average duration before strangulation was about 14 months. Apart from the eight cases of obstructed inguinal hernia that reduced spontaneously within 24 hours

of admission and were electively operated on the next available operation day, all other cases of obstructed hernia had emergency surgery.

Table 1. Characteristics and Presentation of the Study Population

Gender	Number of patients	Percentage
Male	64	50.8
Female	62	49.2
Age distribution (years)		
15 – 30	39	31.0
31 – 45	35	27.8
46 – 60	22	17.5
61 – 75	16	12.7
>75	14	11.1
Clinical features		
Colicky abdominal pain	113	89.7
Vomiting	97	77.0
Abdominal distension	87	69.0
Constipation	82	65.1
Fever	25	19.8
Groin swelling	17	13.5
Weight loss	12	9.5
Shock	4	3.2
Peri-umbilical swelling	2	1.6
Swelling in the Left Spigelian Zone	1	0.8
Comorbid Illnesses*		
No illness	94	74.6
Systemic hypertension	24	19.0
Diabetes mellitus	5	4.0
HIV	2	1.6
Obstructive uropathy	1	0.8

*Some patients had multiple comorbid illnesses

Table 2. Aetiology of Mechanical Bowel Obstruction

Aetiology	Frequency	Percentage
Adhesions and Bands	81	64.3
Obstructed / Strangulated external hernia	20	15.9
Sigmoid volvulus	8	6.3
Intra-abdominal Tumor	7	5.5
Intussusception	4	3.2
Anastomotic Stricture	4	3.2
Fecal Impaction	2	1.6
Total	126	100.0

All 8 cases of the volvulus were of the sigmoid colon, but one of them has associated ileal knotting (ileo-sigmoid knotting) and seven of them were operated as one died before surgery. There were seven cases of AMBO due to intra-abdominal malignancies. These malignancies included four cases carcinoma of the left colon, one case each of the transverse colon, the rectum. There was one case of gastrointestinal stroma tumor (GIST) of the ileum in a known HIV infected patient.

Three of the cases of intussusception were due to lymphoma with enlarged mesenteric nodes being the lead points (two were ileo-colic and one ileo-ileal) while in the third case, no lead point pathology could be identified and this was ileo-colic type. The two cases of intestinal obstruction due to faecal impaction were found in elderly men. One resolved with conservative management while the other was an intraoperative diagnosis where multiple pellets of impacted calcified faeces were found at the rectosigmoid junction and the patient had sigmoid colostomy done. Table 3 shows the indications for the prior abdominal surgery leading to adhesive AMBO.

Table 3. Indications for the prior abdominal surgery leading to adhesive AMBO

*Indications	Frequency	Percentage
Generalized Peritonitis	28	35.9
Acute appendicitis	17	21.7
Obstetric /Gynecologic operations	14	17.9
Previous adhesive AMBO	9	11.5
Gastric outlet obstruction 2 ^o PUD	2	2.6
Strangulated umbilical hernia	2	2.6
Sigmoid Volvulus	2	2.6
Open cholecystectomy	2	2.6
Splenic rupture 2 ^o RTA	1	1.3
Unknown	1	1.3
Total	78	100.0

*Some patients had multiple previous abdominal surgeries

Postoperative complications occurred in seventeen patients (some of them had multiple complications) with surgical site infection (SSI) constituting the majority 64.7% (n = 11), eight of these were incisional SSI, which resolved with regular dressing while the remaining three were organ space (residual abscess) which required drainage. The other complications were four cases of post-operative enterocutaneous fistula, three of which resolved with conservative management, the fourth requiring operative management. Two patients had burst abdomen and both had emergency laparotomy with reclosure. Three patients had deep venous thrombosis (DVT) and there was a case of pulmonary thromboembolism (PTE).

The overall mortality was 10.3% (n = 13). The operative mortality of 7.1% (n = 9) included three adhesive AMBO with strangulated bowel, two patients with advanced left sided colonic carcinoma, one patient with advanced rectal carcinoma and one each of GIST, Sigmoid volvulus

with ileo-sigmoid knotting and strangulated inguinal hernia with obstructive uropathy. The remaining deaths occurred before surgery from complications related to late presentation in some and in others due to associated poorly managed co morbid illnesses.

Discussion

Acute mechanical bowel obstruction (AMBO) is one of the common life threatening emergencies all over the world.⁸⁻¹⁰ There is a global change in the spectrum of the aetiology of AMBO over past years. Recent studies have shown that adhesive intestinal obstruction has replaced obstructed hernias as the most common cause of AMBO.^{4,8-10} although, there is wide geographical variation in the pattern of AMBO. This study was done to determine the current pattern of aetiology of AMBO in our part of the developing world. The pattern of presentation in our study is consistent with that in the reports of many similar studies but the male to female ratio is 1:1 (64/62), though similar to what was reported recently by Abdulrahman¹¹ but it is quite different from other studies which showed significant male preponderance. These gross discrepancies may be due to a large proportion of adhesive MBO occurring after gynecological procedures. In this study, the mean age was 44.5 years which is consistent with the age incidence in many similar reports.^{4,8,9}

The most regular presenting symptoms were colicky abdominal pain, vomiting, abdominal distension and constipation which is in agreement with what is documented in literature.^{5,7,11,12-14} In addition, abdominal distension, tenderness and increased bowel sounds were the most common signs. This study showed that adhesion was the most common cause of AMBO and in majority of cases occurred after laparotomy which is similar to what was reported by Lawal et al. The most common indications for previous abdominal surgery were generalized peritonitis from ruptured viscous (mainly rupture appendix, perforated typhoid, perforated gastric/ duodenal ulcers etc). In other studies, the most common indication for previous abdominal surgery was appendectomy.^{1,15} Obstetrics and Gynecological conditions were the indications for previous abdominal in 17.9% of patients which may be responsible for the almost equal sex distribution seen in this study. It is of interest that cases of AMBO from hernias were not as common as previous reports from this region⁴. This may due to the increasing knowledge of hernia and rising fear of likely complications with majority of patients now presenting early with uncomplicated hernia thus increasing the number of the elective hernia surgery.

The complication rate in our study is 29.3% (n = 17) (some patients had multiple complications). This falls within the range of 14.7-53.6% reported by Kagizman et al and Uludag et al. The most common complication is surgical site infection (SSI) which constitute 64.7% (n = 11). This is similar to the report of Kaya et al and Adesunkanmi et al, who stated that the wound infection is the most common complication. Eight of the cases of SSI resolved with regular dressing while the remaining three were organ space (residual abscess), one of which was aspirated percutaneously under ultrasound guidance and the remaining two were drained with repeat laparotomy. The other complications were four cases of post-operative enterocutaneous fistula, three of which resolved on conservative management, the fourth requiring operative management. Two patients had burst abdomen and both had emergency laparotomy with reclosure. Two patients had deep venous thrombosis (DVT) and there was a case of massive pulmonary thromboembolism (PTE) who eventually died.

The overall mortality was 10.3% (n = 13) which is found to be related to the delay between onset of symptoms and presentation in the hospital. This is comparable to 14% reported by

Lawal et al and 12% reported by Ohene-Yeboah et al both in the developing countries. However, the mortality rate recorded in this study was higher than the rate of 3.5% reported by Arshad et al and 2.4% reported by Naseer et al, both in other developing communities.^{5,8} This may be partly due to a difference in case mix, but complications related to late presentation in some and in others due to associated poorly managed co-morbid illnesses, could be responsible.

Conclusion

The pattern of aetiology of mechanical bowel obstruction in our environment is changing with postoperative adhesion taking the lead, while obstructed / strangulated hernia as a cause is rather on a downward trend. We believe that the unacceptably high mortality can be reduced by increasing the awareness of the public about AMBO with the need to present early coupled with early diagnosis and prompt surgical intervention. In addition, research aimed at finding ways to reduce adhesion formation may reduce the incidence of adhesive obstruction. Furthermore, a general improvement in health care infrastructure especially in the rural communities could further reduce mortality as patients may then present early and have prompt diagnosis and treatment.

Reference

1. Ohene-Yeboah M, Adippah E, Gyasi-Sarpong. Acute Intestinal Obstruction in Adults in Kumasi, Ghana. *Ghana Medical Journal* 2006; 40 (2): 50 -54
2. McConkey SJ. Case series of acute abdominal surgery in rural Sierra Leone. *World J Surg* 2002; 26: 509-513
3. Mark- Ever B. Small Intestine in Sabiston Textbook of Surgery, 18th Edition, Courtney MT, Daniel RB, Mark ME, and Kenneth LM (editors): Elsevier Saunders; 2007; 1334-42.
4. Oladejo OL, Olayinka SO, John OB. Spectrum of causes of Intestinal Obstruction in Adult Nigerian Patients. *SAJS* 2005; 43 (2): 34-36
5. Naseer AB, Din M, Shoaib AQ. Current Pattern of Mechanical Intestinal Obstruction In Adults. *Journal of Surgery Pakistan (International)* 2011;16 (1): 38-40
6. Naaeder SB, Tandoh JFK. Acute Intestinal Obstruction in Principle and practice of surgery including pathology in the tropics. 4th edition, Badoe EA, Archampong EQ and da Rocha-Afodu JT (editors): Ghana Publishing Cooperation. 2004: 572 - 599.
7. Haridimos M, Evangelos M, Dimitrios D, Nikolaos P, Dimitrios T, Panagiotis G et al. Acute mechanical bowel obstruction: Clinical presentation, etiology, management and outcome. *World Journal of Gastroenterology* 2007; 13 (3): 432-437
8. Arshad MM, Madiha S, Rafique P, Krishan S. Pattern of Intestinal Obstruction: Is There a Change in the Underlying Etiology? *Saudi J Gastroenterol.* 2010; 16 (4): 272-274
9. Agarwal T, Sharma SC, Mamta S, Jain SK. Changing Pattern of Acute Intestinal Obstruction in Western Up Region: An Observational Study. *International Journal of Scientific Study* 2014; 2 (5): 39 -41
10. Oladele AO, Akinkuolie AA, Agbakwuru EA. Pattern of Intestinal Obstruction in a Semi-urban Nigerian Hospital. *Niger J Clin Pract.* 2008; 347-50 [PubMed: 19320408]
11. Abdulrahman SM. Intestinal Obstruction in Adult Saudi Arabian Population: A Review of 754 Patients. *Scl. J. App. Med. Sci.*, 2014; 2 (5A): 1532-1536
12. Shawana A, Hafizullah K, Ishtiaq A K, Sher A, Salma G, Ziaur R. Aetiological Factors in Mechanical Intestinal Obstruction. *J Ayub Med Coll Abbottabad* 2011; 23 (3): 26-28
13. Adesunkanmi ARK, Agbakwuru EA. Changing Pattern of Acute Intestinal Obstruction in Tropical African Population. *East Afr Med J* 1996; 11: 726 - 730
14. Osuigwe AN, Anyanwu S. Acute Intestinal Obstruction in Nnewi Nigeria: A five year review. *Nigerian J Surg Res.* 2002; 4: 107-11
15. Murat K, Akin O, Serkan P, Ibrahim A, Zulfu A, Fatih T et al. Mechanical Bowel Obstruction and Related Risk Factors on Morbidity and Mortality. *Journal of Current Surgery* 2012; 2 (2): 55-61