

Pattern of Adult Mechanical Intestinal Obstruction in Delta State University Teaching Hospital

Francis C Campbell¹, Odisi Idiakhwa², Afeyodion Akhator³, Vincent I Odigie⁴

ABSTRACT

Introduction: Adult mechanical intestinal obstruction (AMIO) is a frequent challenge to most practicing general surgeons. Contemporary literature review suggests a change in the pattern of causes with bands and adhesions now being the commonest cause in some reports. Delta state university teaching hospital (DELSUTH) is a state-owned tertiary health facility in Delta State, Nigeria. This study aims to highlight the aetiological pattern of AMIO in DELSUTH and its associated morbidity and mortality.

Material and Methods: All adult patients with clinical and radiological evidence of mechanical intestinal obstruction were prospectively studied over a 32 months period.

Result: 65 consecutive adult patients with AMIO were studied which constitutes 22% of all admitted surgical emergencies seen in our services. Female: Male ratio 1.8:1, Age range was 16 to 100 years and mean age 42.5 years. Post operative bands and adhesions was the commonest cause of AMIO (46.1%). The commonest clinical presentation was abdominal pain (95.4%) and 56.9% of patients had a previous abdominal surgical scar. Obstetric and gynaecological operations were the most common cause of bands and adhesions (46.7%) next was appendectomies (23.3%). Non operative management for band and adhesions was successful in 53.3% and mean duration for symptom resolution was 4 days. Commonest complication was superficial surgical site infection (16%). mortality rate was 15.3%.

Conclusion: Bands and adhesions are the commonest cause of AMIO in DELSUTH and are related to Obstetric/gynaecological operations and open appendectomies. This differs from previous studies in developing countries where obstructed hernia was the dominant cause.

Keywords: Adult Mechanical Intestinal Obstruction, Bands and Adhesions, DELSUTH

INTRODUCTION

Intestinal obstruction is one of the common causes of acute abdomen, it accounts for about 20% of general surgery emergencies.^{1,2} Its management is a challenge to most practicing surgeons and is associated with high morbidity and mortality.^{3,4}

Previous literature indicated that strangulated hernia was the major cause of adult mechanical intestinal obstruction (AMIO) in developing countries.^{5,6} However, recent reports have shown a change in pattern with bands and adhesions being the dominant aetiology.⁷⁻⁹ In fact, it mirrors some reports from developed countries.^{11,12}

The authors wish to share their experience over a 32 month prospective study of the disease as seen in Delta State

University Teaching Hospital (DELSUTH), a tertiary health facility in Delta State South -South region of Nigeria. We intend to highlight the aetiological pattern of AMIO in DELSUTH and the associated morbidity and mortality.

MATERIAL AND METHODS

This prospective observational study was carried out in general surgery department, Delta state university teaching hospital (DELSUTH).

Subject and selection methods: The study population included all consecutive adult patients with clinical and radiological evidence of mechanical intestinal obstruction between June 2012 and February 2015 presenting at Delta state university teaching hospital.

Procedure methodology: Patients with AMIO were studied via a profoma after obtaining due consent. Patients less than 16 years were excluded. Their demographic data, clinical evaluation, investigation results, intraoperative findings, treatment outcome and follow up were documented.

All patients were optimized using intravenous fluids to correct fluids and electrolyte derangement, nasogastric tube to decompress the stomach, indwelling urethral catheter to monitor urine output and parenteral antibiotics consisting of ceftriaxone and metronidazole in therapeutic doses were given.

All data collected were subjected to analysis using statistical package for social sciences version 11.

RESULTS

There were 65 patients with AMIO during the study period. This constituted 22% of all admitted surgical emergencies in our services. The age range was 16 to 100 years. The mean

¹Senior Registrar, Department of Surgery, Delta State University Teaching Hospital, Oghara, Delta State, Nigeria, ²Senior Registrar, Department of Surgery, Delta State University Teaching Hospital, Oghara, Delta State, Nigeria, ³Professor, Department of Surgery, Delta State University Teaching Hospital, Oghara, Delta State, Nigeria, ⁴Professor, Department of Surgery, University of Benin Teaching Hospital, Benin, Nigeria

Corresponding author: Dr Francis C Campbell, Senior Registrar, Department of Surgery, Delta State University Teaching Hospital, Oghara, Delta State, Nigeria

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age was 42.5 years (Figure-1). The peak age group was in the fourth decade (30%). The male to female ratio was 1:1.8. Post operative band and adhesions (46.1%) was the most common cause of AMIO while intestinal tumours constituted 20% and external hernia 18.4%. Others were volvulus (9.2%), intussusceptions (1.5%) and others (two tuberculous obstructions and one Garre's obstruction constituting (4.6%) (table-1).

Obstetric and gynaecological operations (46.7%) were the most common cause of post-operative band and adhesions. Appendectomies accounted for 23.3%, laparotomies for other bowel surgeries was 16.7% and no cause could be identified in 10% of the cases (table-2).

The commonest clinical presentations were abdominal pain (95.4%) dehydration (73.8%) abdominal distension (67.6%) vomiting (61.7%) and constipation (58.4%) while patients with a previous surgical scar were 56.9% (table-3).

The duration of non operative management for adhesive obstruction was between 2-9 days (mean 4 days) and was successful in 53.3%. The gangrenous rate of the bowel with adhesive obstruction was 4%.

Aetiology	Frequency	Percentage
Band and adhesions	30	46.1
Intestinal tumours	13	20.0
External hernia	12	18.5
Volvulus	6	9.2
Intussusception	1	1.5
Others	3	4.6
Total	65	100

Table-1: Causes of Adult Mechanical Intestinal Obstruction (AMIO) in DELSUTH.

Causes	Frequency	%
Obstetrics and gynecological surgeries	14	46.7
Appendectomy	7	23.3
Exploratory laparotomy	5	16.7
Hernia	1	3.3
Idiopathic	3	10.0
Total	30	100

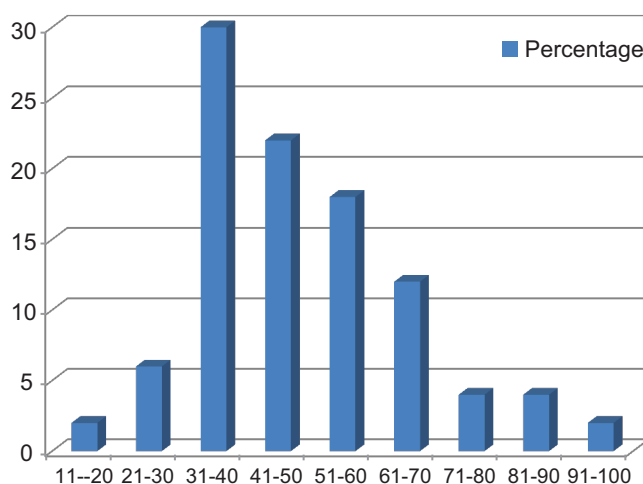
Almost half of band and adhesions follow obstetrics/ gynecological surgeries (46.7%). More than one in five were due to Appendectomy (23.3%).

Table-2: Causes of bands and adhesions

Aetiology	Frequency	Individual mortality %	Overall mortality%
Intestinal tumours	5	38.5	7.7
Volvulus	2	33.3	3.1
Band and adhesions	2	6.7	3.1
External hernia	1	8.3	1.4
Intussusception	0	-	-
Others	0	-	-
Total	10		15.3

Intestinal tumours had the highest individual and overall mortality

Table-3: Individual and overall mortality of AMIO



The Peak age group was in 4th decade, cluster age group was 4th-7th decade= 82%.mean age 42.5 Years.

Figure-1: Age distribution of patients with AMIO.

Malignant obstruction was commonest in the large bowel (85.7%). The rectum constitutes almost one-half (42.8%). Two out of every five rectal tumours were within the reach of the examining finger on digital rectal exam.

Mean post operative stay was 11 days; range was 3-40 days. Commonest post operative complication was wound infection (16%). Anastomotic dehiscence occurred in 4.6%, one patient developed enterocutaneous fistula.

Overall mortality rate was 15.3%, adhesive obstruction accounted for least (3.1%) while obstructing intestinal tumours had the highest burden (7.7%) (Table 3).

DISCUSSION

Mechanical intestinal obstruction constitutes a significant burden of surgical disease in Africa and beyond.^{1,12,13} it accounts for about 22% of all admitted surgical emergency care in DELSUTH South-South Nigeria.

Middle aged adult patients were commonly affected in this study. Our mean age 42.5 years and peak age group in the fourth decade. This was similarly reported in various studies.¹³⁻¹⁵

There was a female preponderance, female to male ratio of 1.8:1. This can be attributed mainly to adhesive obstruction following previous obstetric and gynaecological operations in parturient women. Furthermore, AMIO due to complicated and obstructed hernia, a predominantly male disease is on the decline.

A tetrad of abdominal pain, abdominal distension, vomiting and constipation were the common symptoms seen in our patients which are the usual presentation of patients with obstruction. All the patients required fluid resuscitation and the adequacy monitored preoperatively by urine output which was used a reasonable marker of end organ perfusion.

Industrialization and increased availability of surgeons and well equipped medical facilities coupled with a growing knowledge about hernias amongst the populace and rising fear of likely complication of strangulated hernia are probably the reason for increasing number of elective herniorrhaphy,¹⁴ this observation may be the cause of the decline of AMIO sub-

Saharan Africa.

There is still paucity in minimal access and laparoscopic surgery in the region and open abdominal surgery still occupies the pride of place in this low resource setting. There is an attendant increase in risk of adhesion formation following tissue invasion and injury and prevalence rate of 63-97% have been noted after major abdominal operation.^{16,17}

The change in pattern of causes of AMIO may be attributed to increase in open abdominal surgeries performed and more elective hernia repair in the sub region. As observed in this study, post operative adhesion was the major cause of AMIO accounting for 46.1% of AMIO. Several works in the developing world have shown similar trend.^{1,8,12-14}

It is of the authors opinion that shift from open to minimally invasive surgeries and good operative technique will reduce the rate of adhesion formation.¹⁸

Several substances including anti-inflammatory agents and peritoneal instillates have been studied to reduce the incidence of adhesive obstruction with minimal benefit.¹⁹ However liquid and solid mechanical barriers are promising in preventing adhesions and a systematic review of seven randomized controlled trial have shown that hyaluronic acid/caboxymethyl cellulose membrane reduces the incidence, extent and severity of adhesion, however no evidence that incidence of intestinal obstruction or need for operative intervention is reduced.²⁰

Operative procedure of the lower abdomen and pelvis are associated with higher incidence of adhesion formation.^{19,21,22} Similar finding were noted in this study, gynaecological/obstetrics surgeries and appendectomy accounted for more than two-thirds of adhesive obstruction.

Patients with adhesive obstruction can be safely managed using non operative protocol.^{1,23,24} However, this entails more intensive monitoring to prevent bowel gangrene and other complications. In this study more than half (53.3%) of patients benefited from non operative management and this is advocated by the authors with a caution that intensive monitoring of abdominal signs is required.

The low gangrenous rate of 4% observed in the study is attributed to close monitoring of patients and early surgical intervention when physical signs change.

The upper limit for safe non operative management of adhesive obstruction is controversial. While some authors recommend limited observation for 24-48 hours^{25,26} others suggest that longer duration (5-7days) is safe provided patient is adequately monitored.^{27,28} The mean time for Resolution of symptoms in our patients on this protocol was 4 days and range 2-9 days.

Intestinal tumours are increasing cause of AMIO in developing countries and are mostly due to obstructing colorectal tumours.^{7,29} One in five of our patients had intestinal tumour as cause of obstruction and were mostly due to malignant colorectal disease (85.7%). This high incidence observed is probably due to pooled cases from peripheral centres to our hospital and may not be a true reflection of the burden of disease in the community. Most of the patients benefitted from expedient faecal diversion to relieve the obstruction until

a planned definitive procedure done for them if operable.

Volvulus is an uncommon cause of AMIO in this study which is different from studies in other parts of Nigeria and Africa.^{1,30} These patients often present late with gangrenous bowel and associated sepsis and most had a staged operation. Facilities for endoscopic untwisting are not available in our centre and late presentation precludes their use.

The mortality in this study was 10(15.3%). More than half of the deaths (7.7%) occurred from advanced malignant obstructions. Adhesive obstruction accounted for the least (3.1%) cause of mortality. Death was majorly due to sepsis and renal failure.

This high mortality of AMIO in developing countries can be attributed to poverty, ignorance about the disease and late presentation. Also, scarcity of trained personnel and facilities to undertake these complex procedures may contribute. In developed countries with advanced health care delivery system and were patients with the disease present early to hospital, mortality of 3.5% and lower have been reported.^{31,32}

This is a single centre study with limited sample size, we suggest that a multicentre study be conducted in near future to further revalidate our findings. We also noted a high incidence of intestinal tumours being the second common cause of AMIO which is at variance to that reported in literature.^{1,3,5,6}

This observation may be attributed to the referral chain peculiar to the south-south region of Nigeria as minor cases of bowel obstruction are fixed in the local community general hospitals while complex cases of tumour obstructions are referred to our tertiary centre.

CONCLUSION

Band and adhesions are the commonest cause of adult mechanical intestinal obstruction in DELSUTH, it is related to obstetric/gynaecological surgeries and open appendectomies. This differs from previous studies in developing countries where obstructed hernia was the dominant cause. Meticulous surgical techniques and minimally invasive surgeries may reduce this observation. There is need for non-operative management of AMIO due to bands and adhesions with very close monitoring of patient's physical signs as this is associated with good outcome.

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