

## Acute Bowel Obstruction in a Rural Hospital in Northern in Northern Uganda.

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**Background:** The aim of the study is to find the aetiology and outcome of bowel obstruction treatment in St. Mary's Hospital Lacor vis-à-vis other centres in the world.

**Methods:** A retrospective review of patients' files from January 2007 to December 2008 was done. The variables studied were age, sex, duration of symptoms, cause of obstruction, bowel resection, length of hospital stay, postoperative complications and mortality.

**Results:** There were 132 patients with a mean age of 31.5years and M:F ratio of 2.2:1. Duration of symptoms ranged from 1 – 14days with a mean of 4days. The leading cause of obstruction was Hernias in 53(40.2%) patients followed by Adhesions in 27(20.5%). Gut volvulus was third in 23(17.4%) patients. Bowel resection rate was at 48.5%. Length of stay ranged from 1 – 39 days with a mean of 8 days. The commonest complication was wound sepsis ± dehiscence (50%). Morbidity rate was 24.2%. Mortality rate was 12.9% with 100% case fatality rate for neonatal intestinal atresia.

**Conclusion:** Obstructed/strangulated hernias rather than Adhesions are still a leading cause of bowel obstruction.

### Introduction

In rural Africa, acute intestinal obstruction accounts for a great proportion of morbidity and mortality. The commonest cause of these obstructions varies from region to region. The objective of this study was to find out the aetiology and outcome of bowel obstruction treatment in St. Mary's Hospital Lacor in Gulu district, Northern Uganda and to compare these with other reports.

### Methods

The study was a retrospective review. Medical records of patients who presented to the unit between January 2007 and December 2008 with the diagnosis of bowel obstruction were reviewed in consecutive fashion and the following variables were recorded and collated: age, sex, duration of symptoms, Cause of obstruction, bowel resection, length of hospital stay, postoperative complications and mortality. Patients with subacute obstruction, those with intestinal obstruction who were managed conservatively and those with incomplete records were excluded from the study. Results were analysed using Epi Info (version 3.3.2).

### Results

During the period under review a total of 144 patients were admitted with acute bowel obstruction. Twelve excluded from the study due to incomplete records. The results presented are based on the remaining 132 patients. There were 91 males and 41 females, giving a M:F ratio of 2.2:1.

The ages of patients ranged from one week to 80 years with a mean of 31.5years. The duration of symptoms ranged from 1 to 14 days with a mean of 4 days. Only 35 patients presented within 24 hours after the onset of symptoms.

**Table1.** Age distribution in years

Age in Yrs	<1	1– 9	10-19	20-29	30-39	40-49	50–59	60–69	≥70
No of Pts	12	16	12	30	29	9	10	11	3

**Table 2.** Causes of Bowel Obstruction:

Cause	No of Pts.	%	Died	Discharged
Adhesions	27	20.5	3	24
Hernia	53	40.2	0	53
Intestinal atresia	3	2.3	3	0
Intussusception	15	11.4	3	12
Merkel's Diverticulum	3	2.3	0	3
Mesenteric Vascular Occlusion	3	2.3	2	1
Neoplasms	5	3.8	3	2
Volvulus	23	17.4	3	20
<b>Total</b>	<b>132</b>	<b>100</b>	<b>17</b>	<b>115</b>

**Table 3.** Duration of symptoms Vs Bowel resection:

Duration of symptoms	No Resection	Resection Done	Total
≤1 day	30 (85.7%)	5 (14.3%)	35
>1 day	38 (39.2%)	59 (60.8%)	97
<b>Total</b>	<b>68</b>	<b>64</b>	<b>132</b>

### ***Causes***

The commonest causes of obstruction were Hernias (obstructed/strangulated), Adhesions, Volvulus and Intussusception-(see table2). Of the 23 patients with volvulus, 17 involved sigmoid colon, but other presentations of Volvulus were also seen; ileosigmoid knotting (N=2), caecal volvulus (N=1), volvulus neonatorum (N=1), and small bowel volvulus (N=2). There were two anastomotic leaks and three deaths following operative treatment of all causes of volvulus. Ileocolic intussusception was the commonest presentation of intussusception accounting for 12 of 15 cases. There were two cases of ileoileal intussusception and one case of colocolic. Eight patients were five years or younger (six were less than one year), seven were twenty (20) years or older. Of the 53 patients with Hernias, 32 were inguinal, 14 umbilical. There was one internal hernia, three femoral and three epigastric hernias. 10 of 53 hernias were strangulated and required bowel resection.

### ***Treatment***

A total of 64(48.5%) patients had bowel resection and this was most frequent amongst those presenting with volvulus (18), intussusceptions (11) and adhesions (11) but hernias, intestinal atresias, Meckel's diverticulum, vascular occlusions and neoplasms also caused intestinal obstruction which required bowel resection. The resection rate was higher in patients who stayed longer at home and presented with duration of symptoms of more than one day, with a p-value of 0.000 and an Odds Ratio of 9.315789 (Table 3).

### ***Length of stay***

Length of Hospital stay ranged from 1 – 39 days with a mean of 8 days and a mode of 2 days. The median length of hospital stay was six (6) days with 73(55.3%) and 59(44.7%) patients staying for

between 1 – 6 and  $\geq 7$  days respectively. Bowel resection was associated with a longer Hospital stay, with 43(73%) of the 59 patients who stayed for seven or more days being those who had their bowel resected.

### **Mortality**

Complications were 32 patients developed postoperative complications – morbidity 24.2%. The commonest of these complications were wound sepsis and/or dehiscence (16), septicaemia and organ dysfunction/failure (8) and anastomotic leak (2). Others included deep venous thrombosis, bronchopneumonia and cardiac arrest. Seventeen (17) patients died – 10 males and 7 females, giving a mortality rate of 12.9%. Case fatality rate was highest in intestinal atresia and was 100%.

### **Discussion**

Acute bowel obstruction presents as a frequently encountered emergency in hospitals throughout the world, accounting for a great proportion of emergency room visits<sup>11,12</sup>. This poses a challenge to the surgical trainee. Its treatment requires careful pre-operative preparation, good surgical judgement and technique and post-operative care which is often very demanding.

Bowel obstruction has complex physiological derangements associated with it and is thus an important contributor to post-operative morbidity and mortality. The associated shock with haemoconcentration, hypovolaemia and electrolyte imbalance often results from: sequestration of fluid or blood into lumen, bowel wall and peritoneum, excessive vomiting and nasogastric suction and decreased oral intake. Patients may lose up to 4 – 8 litres of fluid (intra and extravascular) and this continues to increase unless an appropriate early intervention is carried out.<sup>26,27,28</sup>

In this study, males constituted 68.9% which is comparable to other studies<sup>4,13, 17, 21</sup>. Ntakiyiruta and Mukarugwiro<sup>4</sup> in their study reported a duration of symptoms of 3.5 days which is comparable with what we found but contrasted with Haridimos et al's 33.5 hours<sup>2</sup>. Delayed presentation and/or surgical intervention frequently results in relatively poor surgical outcome and/or longer hospital stay<sup>4,10</sup>. This was evident in this study as shown in the statistics above. Reasons for delay may include poverty, long distance to care centres, poor infrastructure and health seeking behavior<sup>4,15,26,20</sup>.

In this series, the four leading causes of obstruction included hernias, adhesions, volvulus and intussusception. Hernias are a leading cause of obstruction in most African centres<sup>4,9,10,16,20,22</sup>) which may be caused by the paucity of surgical services in the region<sup>5</sup>. Hernias may occur in a congenital preformed sac (remains of processus vaginalis) or follow straining from heavy weight lifting, chronic cough, benign prostatic hyperplasia and urethral stricture or may follow a familial collagen disorder.<sup>26,27,28</sup>

Groin hernias constitute about 75% of abdominal wall hernias<sup>26,27,28</sup>. In this study, they constituted 66.04% of which 8.6% were femoral. Sourkati et al<sup>20</sup> reported a 70% frequency of inguinal hernias. Hernias with a narrow neck (femoral, inguinal) are more prone to obstruction and/or strangulation and the earlier they are repaired, the better the outcome<sup>26,27,28</sup>. Our community in Northern Uganda has been greatly preoccupied in recent years by economic instability, social insecurity and rebel activities, consequently asymptomatic hernias are often ignored till they are painful or strangulated. Adhesions are a growing cause of bowel obstruction in many centres in the developing world<sup>4,8,9,17,20,21</sup>. In the Greek experience, adhesion rate was as high as 64.8% which is triple that in this series<sup>2</sup>. Adhesions are commonly associated with previous abdominal surgery<sup>3,6,8,11</sup>. Oladele et al<sup>21</sup> found a rate of 44%, 75% of which had previous abdominal surgery. Ellis<sup>23</sup> found postsurgical adhesion rate of 92.9%, 1% developing within the first postoperative year and half of these within the first month. In virgin abdomens, previous pelvic inflammatory disease may account for a good proportion of adhesions in females.

Operative intervention for adhesive bowel obstruction frequently involves adhesiolysis but gangrene and/or multiple perforations due to adhesion bands occluding mesenteric vessels may warrant

resection and anastomosis<sup>26,27,28</sup>. In this study, 11 of 27 patients with adhesion required gut resection. In addition, three patients with Meckel's Diverticulum had an associated adhesion band and all required gut resection. With the disappearance of rebel activity and improvement in the accessibility of surgical services in our region, there's bound to be an increase in elective abdominal and pelvic surgery which may in turn produce an increase in the number of patients with adhesion-associated bowel obstruction. Preventive measures may not be very feasible in many African centres<sup>24,25</sup>.

Volvulus is an important cause of mechanical bowel obstruction accounting for 17.4% in this series. Sigmoid volvulus was found to be the leading cause of bowel obstruction in Northern Ethiopia which in this study was responsible in 17 of 23 patients with volvulus<sup>8</sup>. Caecal volvulus was least common, a finding comparable to that of Yasushi et al<sup>1</sup> but contrasted with what Garth et al<sup>14</sup> found.

Of the fifteen patients who had intussusception as the cause of obstruction, the lead point was found to be a benign polyp in one and idiopathic in all other fourteen. This is comparable to other studies in which intussusceptions had no associated pathology in over 65% of the cases<sup>18,19</sup>.

Neoplasms, either of large or small gut are still an uncommon cause of bowel obstruction in many African centres<sup>16, 17,22</sup>. Left sided colonic tumours commonly present with rectal bleeding and/or intestinal obstruction whereas right sided tumours may present with anaemia and wasting except for those around the hepatic flexure which may present as closed loop obstruction in the presence of a competent ileocaecal valve<sup>26,27,28</sup>. In this series, two patients had tumours at the rectosigmoid junction while each of the others had tumours involving caecum, transverse and ascending colon. All five patients had bowel resection and three died, two were discharged on palliative care.

There were three patients who presented acutely with full length gangrene of ileum due to occlusion of the superior mesenteric vessels. Acute mesenteric ischaemia commonly involves superior mesenteric vessels, mainly superior mesenteric artery (SMA) and can be occlusive (embolic, thrombotic) or non-occlusive<sup>26,27,28</sup>. Occlusion of the inferior mesenteric artery is usually less severe owing to the rich collaterals. Levels of ischaemia vary depending on the level of occlusion of the vessel with gangrene occurring from duodenojejunal junction to splenic flexure in occlusion of the main trunk of the SMA<sup>26,27,28</sup>. Two of the patients (females) had gangrene of ileum extending to proximal jejunum due to occlusion around the origin of the SMA. Both females, one of whom was pregnant and had a caesarian section at the same setting, died due to irreversible septic shock and organ failure. The third (male), had sparing of the whole jejunum with occlusion at the level of middle colic artery. He lived for seven days, was counseled and discharged.

Three neonates presented before the age of three weeks with obstruction due to intestinal atresia. Atresia of the intestine may involve duodenum or jejunoileum and range from types 1 to 4 with type 2 being commonest about 40%<sup>26,27,28</sup>. These neonates had type 2 atresia of distal ileum, required resection of atretic segment and end to side anastomosis due to a greatly distended proximal ileum. All the neonates however died. The high case fatality rate was due to overwhelming sepsis, electrolyte imbalance and dehydration. The neonates required care in the intensive care unit (ICU) with ventilation which is still a challenge in our hospital.

Overall, of the 132 patients operated on for bowel obstruction, 64(48.5%) had bowel resection. Volvulus (28%) was the most common cause followed by intussusceptions and adhesions (17.2%). Ntakiyiruta et al<sup>4</sup> report a lower resection rate of 38.1 %. Of those who had bowel resection, 59 (92.2%), had reported 24 hours after onset of symptoms- see table 3. These figures show that adequate health education to improve health seeking behaviour, poverty eradication and infrastructure development would decrease delayed reporting, bowel resection rate, length of hospital stay and ultimately hospital costs.

Postoperative morbidity of 24.2% was mainly due to wound sepsis ± dehiscence (N=16). Bacterial load varies along the gastrointestinal tract from less than 10<sup>3</sup> organisms/ml in the stomach to as high

as  $10^9$  or  $10^{10}$ /ml in the colon. These organisms are usually gram negatives and anaerobes. Translocation of these organisms to the peritoneum and systemic circulation leads to peritonitis and sepsis and/or septic shock<sup>26,27,28</sup>. Ohene-Yeboah et al<sup>10</sup> also report this as the commonest complication. Basic principles of sterilization and asepsis, adequate pre-operative resuscitation and antibiotic coverage would reduce this. Mortality rate of 12.9% is comparable to other studies<sup>8,9,13,22</sup>, however Sourkati et al<sup>20</sup> and Oladele et al<sup>21</sup> report mortalities of about 20% in their series.

### Recommendation

An in-depth and comprehensive Health Education to improve health seeking behavior is recommended: this involves a strong political will, inclusion of surgical conditions in health talks and shows. Village health care team should be taught the dangers of certain surgical conditions since they are the ones in contact with the local population every day. Hernias should also be repaired electively which is possible if young Doctors spread out in various rural hospitals are consciously taught the necessary skills. Furthermore, record keeping needs to be improved in health units.

### Conclusion

- Hernias are still the leading cause of bowel obstruction in our hospital and in many developing countries despite the increase in the cases of Adhesions.
- Neonates have long been known as delicate groups of patients and their postoperative care other than technique of surgery is still a big challenge for a general hospital like ours.

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