

## ACUTE INTESTINAL OBSTRUCTION IN ADULTS IN KUMASI, GHANA

\*M. OHENE-YEBOAH, E. ADIPPAH AND K. GYASI-SARPONG

Department of Surgery, Komfo Anokye Teaching Hospital, Kwame Nkrumah University of Science and Technology, University Post Office, Kumasi, Ghana.

### SUMMARY

**Objectives:** To describe the causes of acute intestinal obstruction in Kumasi and highlight the associated morbidity and mortality.

**Design:** A proforma based prospective study.

**Setting:** The study was conducted at the Department of Surgery, Komfo Anokye Teaching Hospital Kumasi, Ghana, from January 1998 to December 2003 inclusive.

**Participants:** All consecutive adult patients admitted to the surgical emergency ward with a clinical diagnosis of acute intestinal obstruction, strangulated hernia, volvulus and intussusceptions were included in the study. Patients diagnosed as incarcerated or irreducible hernia were excluded.

**Results:** Strangulated external hernias 412 (63.2%), and post-operative adhesions 176 (27.2%) accounted for nearly (90.4%) of the 652 cases. All other causes of obstruction including volvulus, neoplasia, strictures and intussusceptions accounted for less than 10% of the patients. Five hundred and eighty – one patients were operated upon and nearly half (242) required bowel resections with an overall mortality of 12 %. Compared with previous reports, adhesive obstructions are increasing whiles strangulated hernias are decreasing.

**Conclusion:** Strangulated external hernias and adhesions remain the leading causes of acute intestinal obstruction in our environment. Sustained efforts at elective repair of hernias and research aimed at reducing adhesions are likely ways to reduce the high mortality from acute intestinal obstruction .

**Keywords:** Intestinal obstruction, changing patterns, outcome, elective hernia repair.

### INTRODUCTION

In many poor countries of the world, acute abdominal emergencies cause many deaths<sup>1-4</sup>. Acute intestinal obstruction is one of the wide varieties of abdominal conditions responsible for these deaths.

The exact cause of obstruction and the facilities available for treatment influence the outcome. Previous studies<sup>5-7</sup> indicate that in this country external hernia, potentially preventable cause of obstruction, cause majority of obstructions with associated high mortality.

This study from Kumasi, Ghana, was designed to reveal the most important causes of obstruction today and to detect any significant changes in the pattern of obstruction over the past three decades. The facilities available are presented and the outcome of treatment is compared with previous series from presumably similar populations.

### MATERIALS AND METHODS

From January 1998 to December 2003 inclusive – a period of 6 years – all adult patients admitted to the emergency ward of the Komfo Anokye Teaching Hospital (KATH) with a clinical diagnosis of acute intestinal obstruction, strangulated hernia, volvulus and intussusceptions were included in the study. Patients diagnosed as incarcerated or irreducible hernia were excluded.

The name, age and sex of each patient were recorded on a special prepared chart. The onset, duration, and main symptoms of obstruction, as well as the past medical history, x-ray and operative findings were also recorded. Findings on plain abdominal radiographs and later at operation confirmed the diagnosis.

Once the clinical diagnosis of obstruction was confirmed with plain abdominal x-rays the initial treatment comprising naso-gastric decompression, intravenous crytalloids, bladder catheterization, antibiotics and adequate analgesics was started.

Surgery was defined as emergency (within 48 to 72 hours) or postponed for several days. Recorded operative findings included the site of obstruction, and the operative procedure to relieve it. All deaths

\* Author for correspondence

were recorded and mortality referred to deaths occurring during the same hospital admission.

### Staff Strength and Quality

The department has 3 general surgical consultants, and 8 surgeons-in-training. Seventy-five to eighty percent of emergency operations are performed by trainee surgeons whose level of experience and surgical expertise is very variable. There are 5-doctor and 21-nurse anaesthetists. Trained theatre nurses are not available for most of the emergency hours.

## RESULTS

Six hundred and fifty-two cases of obstruction were treated over the six-year period. There were 412 males and 240 females, a male to female ratio of 1.7:1.

### Etiology

Table 1 summarizes the causes of acute intestinal obstruction. Table 2 shows the sex, and age distribution of the various causes. Strangulated inguinal hernias occurred mostly on the right (251). The average duration before strangulation was 3.5 years.

**Table 1** Causes of acute intestinal obstruction

Cause	No. of Patients	Percentage of Total
Strangulated external hernia	412	63.18
Adhesions and bands	176	27.20
Volvulus	38	5.83
Neoplasia	15	2.15
Small bowel strictures	5	0.78
Intussusceptions	3	0.47
Others	3	0.47
<b>Total</b>	<b>652</b>	<b>100</b>

The previous operative procedures in 130 postoperative adhesive obstructions are shown in Table 3. Of the 46 cases of primary adhesions found at laparotomy, 12 were congenital bands and 34 were considered post-inflammatory adhesions. All 38 cases of volvulus were of the sigmoid colon.

There were 15 patients who had bowel obstruction due to intra-abdominal malignant diseases. These malignancies included carcinoma of the right colon 4, left colon 7, jejunum 1; small bowel lym-

phoma 1 and 2 cases of secondary ileal carcinoma from an ovarian primary. Of the 5 strictures of the terminal ileum, 3 were due to tuberculosis and 2 post-anastomoses stenosis.

**Table 2** Age and sex incidence of causes of acute intestinal obstruction

Cause of obstruction	No. of Patients	Male	Female	Average age years	Percentage of total
Strangulated inguinal hernia	320	270	50	38	49.0
Strangulated umbilical hernia	51	12	39	35	7.8
Strangulated epigastria hernia	13	7	6	45	2.34
Strangulated femoral hernia	15	2	13	52	2.34
Strangulated incisional hernia	13	2	11	31	2.03
Adhesions	176	73	103	32	27.0
Volvulus	38	28	10	65	5.83
Neoplasia	15	6	9	56	2.34
Strictures	5	3	2	30	0.78
Intussusceptions	3	-	3	35	0.47
Others	3	1	2	54	0.47
<b>Total</b>	<b>652</b>	<b>412</b>	<b>240</b>	<b>-</b>	<b>100%</b>

There were three cases of ileocolic intussusceptions in young women aged 26, 29 and 35 years. Three other miscellaneous causes including one gall-stone obstruction in a 38 year old woman, one case of small bowel herniation into a broad ligament defect in a 65 year old woman, and one mesenteric infarction in a 52 year old man with bilateral femoro-popliteal vascular occlusion.

### Surgery

Five hundred and eighty-one patients (89%) were operated upon during the treatment for intestinal obstruction (Table 4).

**Table 3** Previous operations in 130 cases of post-operative adhesive obstruction

Previous operations	Number
Appendicectomy	43
Closure of ileal perforation	32
Salpingectomy	15
Closure of gastro-duodenal perforation	7
Caesarean section	6
Volvulus	2
Not known	25
<b>Total</b>	<b>130</b>

**Table 4** Treatment and outcome of obstruction due to hernias, adhesions and volvulus

Cause	Operative intervention	No. of patients	Bowel resection	No of deaths
Hernia	No operation	21	-	9
	Operation within 48 hours	311	61	8
	Delayed to 72 hours	80	48	18
Post-operative adhesions	No operation	72	-	9
	Operation within 48 hours	15	3	1
	Delayed to 72 hours	43	18	9
Primary adhesions	No operation	9	-	3
	Operation within 48 hours	5	2	-
	Delayed to 72 hours	32	21	7
Sigmoid volvulus	No operation	6	-	5
	Operation within 48 hours	21	21	3
	Delayed to 72 hours	11	11	6

Emergency operations (within 72 hours) were done in 95% (391/412) strangulated hernias with a bowel resection rate of 27.8% (109/391). The surgical procedures and outcome for the four most common types of obstruction are summarized in Table 4.

Other bowel resections done included 4 right hemi-colectomies, 4 Hartman's procedures and 3 left hemi-colectomies for colon cancer obstruction, and 3 right hemi-colectomies for ileocolic intussusceptions.

Twelve hernias comprising 3 inguinal, 5 umbilical, 2 epigastria, 1 femoral and 1 incisional reduced within 4-6 hours of admission and were repaired within a week of admission. The Bassini procedure was the standard technique for inguinal hernia repair.

### Mortality

Seventy-eight patients died during admission from intestinal obstruction, 26 before and 52 after surgery – an over-all mortality of 12%. Of these 78 deaths, 63 (80.7%) were referred from centers outside the Kumasi metropolis and 71 (91.5%) were admitted 5 days or more after onset of illness. Lack of transport, financial difficulties, and double referrals – health center to district hospital and them to Komfo Anokye were some of the causes of delayed presentation. The 26 deaths before operation were due to a combination of hypovolemic shock, uremia, sepsis and aspiration.

Of the 52 post-operative deaths 38(73%) occurred in the first 48 hours after operation, 10 (19.2%) within 3 days and 4 (7.7%) after one week. Severe hypotension, oliguria and pulmonary edema were some of the findings in the 38 early postoperative deaths. The other 14 deaths were due mainly to post-operative peritonitis. The postoperative mortality was 8.9%.

**Table 5** Common causes of intestinal obstruction and over-all mortality over three decades

Author and year	Hernia	Adhesion	Volvulus	Total	Overall mortality
Badoe 1995	77.2%	10.2%	5.2%	782	9.1%
Archampong et al 1984	85%	6.4%	3.3%	3,839	10.2%
Naaeder et al 1993	59.8%	21.0%	6.2%	552	9.4%
Ohene-Yeboah 2003	63.2%	27.2%	5.8%	652	12%

### Morbidity

Entero-cutaneous fistula wound infection and burst abdomens were the main complications in the resection group.

Previous report on causes of intestinal obstruction and associated mortality in Ghana are summarized in Table 5.

## DISCUSSION

This study was undertaken primarily to establish the causes of intestinal obstruction in our environment today. Nearly all the cases of bowel obstruction (90.4%) were due to strangulated inguinal hernias—mostly inguinal hernias and adhesion (Table 1 and 2). It is generally accepted that many of these inguinal hernia may be present at birth<sup>8</sup>. This may explain the high incidence of these hernias in our predominantly young population<sup>9</sup>. Availability of surgical expertise for the elective repair of these hernias may reduce the risk of strangulation.

Our second objective was to observe any changes in the causes of acute intestinal obstruction today compared with the causes published in previous studies – spanning a period of three and a half decades – from a presumably similar population<sup>5-7</sup>. It is clear from the present and previous series that the incidence of adhesive obstructions has more than doubled with a proportional decrease in the incidence of strangulated hernias during the intervening period (Table 5). The possible impact of this changing pattern of intestinal obstruction on the mortality from the disease has yet to be determined. Similar transition from a hernia dominated pattern of obstruction to increasing adhesive obstructions has been noted in other populations<sup>10,11</sup>. The driving force in these transitions has been the increasing surgical enterprise for the aggressive elective repair of hernias<sup>11</sup> and laparotomy for abdominal disease. If sustained, these efforts at elective repair of hernias have the potential to remove a preventable cause of intestinal obstruction and thus reduce the associated high mortality.

What are the barriers to elective repair? McConkey in 2002 identified expenses of surgery and distance to hospital as some of the disincentives to elective repair in rural Sierra Leone<sup>2</sup>. The cost of surgery is high in comparison to the low incomes in Ghana<sup>9</sup> and thus an important barrier to elective repair.

Adhesions remained the second commonest cause of obstruction (Table 1). The incidence of these adhesive obstructions which has more than doubled over the decades is expected to increase further as more laparotomies especially for appendicitis and typhoid ileal perforations are performed (Table 3)<sup>12</sup>.

The pattern of operative treatment in this series (Table 4) reflects the standard approach to the management of patients with intestinal obstruction in Kumasi. After resuscitation, early surgery was performed on a majority (95%) of hernias. The mortality of 6.7% (26/319) for strangulated hernias compared favourably with other published series<sup>5-7</sup>.

In contrast, 55% of post-operative adhesive obstructions responded to a period of conservative treatment, thereby avoiding surgery. However, the resection rate of 46% in the delayed group of patients with adhesive obstruction indicates the need for closer observation of these patients during the period of conservative treatment to detect signs of strangulation early.

The very high resection rate (62.5%) in post-inflammatory primary adhesive obstructions (Table 4) may be due to the very dense nature of the adhesions<sup>13,14</sup> as well as the delay in surgical intervention. In the absence of an obvious cause of obstruction early surgery is strongly recommended to avoid strangulation and the need for bowel resection.

This study was not designed, to determine the optimal treatment of sigmoid volvulus, the commonest cause of large bowel obstruction in our environment. However, the mortality of 23% (Table 4) following emergency sigmoid colectomy and primary anastomoses would support a resection rather than other modes of treatment for which the mortality varied between 30 to 40%<sup>6,7</sup>.

The overall mortality of 12% is higher than published series from similar populations. This may be partly due to a difference in case mix, however nearly all the postoperative deaths in this series occurred within 3 days with 73% occurring within 48 hours. Late presentation and poor clinical judgment thereby operating on inadequately prepared patients may account for the hypotension, oliguria and ureamia noted in these early mortalities. Kumasi serves a much larger rural population than Accra<sup>9</sup>. This may partly account for the late presentation in this series as poor infrastructure (healthcare, roads, transportation), poverty and ignorance are typical of our rural communities. Earlier presentation could reduce the high mortality.

The effect of prolonged strangulation on mortality is striking. In the hernia group for instance, the operative mortality of 2.6% (8/311) following sur-

gery at 48 hours, increased sharply to 22.5% (18/80) after surgery at 72 hours. Every effort must be made to have early surgery for these patients.

In this series the overall post-operative mortality of 8.9% compares favourably with other published series<sup>2,5,7,15</sup>.

Firm measures are needed to reduce these largely preventable deaths which affect the most economically productive sectors of the population (Table 2). Such measure include elective repair of hernias.

## CONCLUSION

Acute intestinal obstruction remains a major cause of mortality in our environment. External hernias are still a major cause. The pattern is however changing with increasing adhesions and decreasing hernias. The mortality has remained unacceptably high. It is apparent from this report that increased efforts to repair external hernias before strangulation occurs are likely to reduce the incidence and mortality from intestinal obstruction. In addition research aimed at finding ways to reduce adhesion formation may reduce the incidence of adhesive obstructions. For affected patients, high quality surgical expertise coupled with sound clinical judgment and early surgery when needed will greatly improve survival.

Furthermore a general improvement in health care infrastructure especially in the rural communities could further reduce mortality as patients may then present early.

## ACKNOWLEDGEMENT

I am very grateful to Professor Charles Mock, Seattle, USA for reading the manuscript. I also would like to thank residents and house officers for completing some of the information charts. Miss Esther Duodu for typing the script several times over, accept my gratitude.

## REFERENCES

1. Adesunkami R.A. et al. Acute generalized peritonitis in adult African patients: assessment of severity using APACHEII score. *Ann Coll Surg HK* 2003; 7: 23-28.
2. McConkey SJ. Case series of acute abdominal surgery in rural Sierra Leone. *World J Surg* 2002; 26: 509-513.
3. Harouna Y, Yaya H, Abdou T. Prognosis if strangulated inguinal hernia in the adult. Influence of intestinal necrosis. A propos of 34 cases. *Bull Soc Paltol Exot* 2000; 93: 317-320.
4. Mock CN, Amaral J, Visser LE. Improvement in survival from typhoid ileal perforation, results of 221 operative cases. *Ann Surg* 1992; 215: 244-249.
5. Naaeder SB, Archampong EQ. Changing pattern of acute intestinal obstruction in Accra. *West Afri J Med* 1993; 12: 82-88.
6. Archampong EQ, Owusu PA and Amankwa JA. The pattern of acute intestinal obstruction at Korle Bu Teaching Hospital, Accra. *The West Afri J Med* 1984; 263-270.
7. Badoe EA. Acute intestinal in Korle Bu Teaching Hospital, Accra: 1965-1969. *Ghana Med J* 1970; 9: 283-287.
8. Darko R. In herniae (excluding diaphragmatic herniae in principles and practice of surgery including pathology in the tropics. 3<sup>rd</sup> ed. EA BAdoe, EQ Archampong and JT da Rocha-Afodu. *Ghana Publ Corp* 2000; 482-508.
9. Ghana Statistical Service. 2000 Population and housing census, Summary report of final results. March 2002.
10. Mc Entee D et al. Current spectrum of intestinal obstruction. *Br J Surg* 1987; 74: 976-980.
11. Nelson W and Ellis H. The spectrum of intestinal obstruction today. *The Br J Clin Pract* Jul-Aug 1984; 249-251.
12. Ohene-Yeboah M. Causes of acute generalized peritonitis in 1188 consecutive adult patients in Ghana. *Trop Doc* 2005; 35: 84-85.
13. Badoe EA. Causes of peritonitis in Accra, Ghana. *West Afr Med J* April 1968; 42-44.
14. Gilroy BP. Adhesive obstruction. *Ann Roy Coll of Surg Eng* 1984; 60: 164-169.
15. Attah C, Anikwe R. Patterns of mechanical obstruction of the small bowel in Nigeria. *Am J Surg* 1980; 140: 645-647.