

# Pattern of Intestinal Obstruction at Hajjah Governorate in Yemen

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**Background and objectives:** Intestinal obstruction remains one of the commonest causes of acute abdomen worldwide. The underlying causes vary from country to country and change within the same country. Our study is to determine the pattern of intestinal obstruction in Hajjah governorate and evaluate surgical management.

**Patients and methods:** All patients operated on for acute intestinal obstruction in the Department of Surgery in Saudi hospital at Hajjah governorate in Yemen between July 2012 and September 2014, were included in this study. Patients' demographics, medical history, clinical examination, para-clinical investigations, operative finding, type of procedure and postoperative complications were prospectively collected and analyzed.

**Results:** The total number enrolled in this study was 164 patients, 101 men and 63 women with age range from 1 day to 80 years old.

Strangulated/obstructed external hernias were the most common cause of intestinal obstruction (48 patients, 29.2 %) followed by intra-peritoneal adhesions and bands (39 patients, 23.7%). Intussusception was found in 20 patients (12.1%). Intestinal volvulus and malignancy of the colon were found in 17 and 15 patients respectively (10.3% and 9.1%). Other rare causes such as ascaris (1.8%), postoperative intraperitoneal tube drain (0.6%), intestinal tuberculosis (1.8%) and foreign body in the rectum (0.6%) were found too.

Adhesiolysis and intestinal resection were the commonest operative procedures. Postoperative complications were found in 44 patients (26.8%). Mortality was recorded in 15 patients (9.1%).

**Conclusion:** Strangulated/obstructed external hernias were the most common cause of acute intestinal obstruction followed by adhesive causes, intussusception, intestinal volvulus and colonic tumors. Adhesiolysis and resection of gangrenous intestine were the most perforated procedure.

Our postoperative complications and mortality remain accepted and lower than others.

**Key words:** Intestinal Obstruction, pattern, surgical management.

## Introduction

Intestinal obstruction remains one of the commonest causes of acute abdomen worldwide with high morbidity and mortality.<sup>1-3</sup> The causes of intestinal obstruction not only vary from country to country, but they are changing even in the same country.<sup>4,5</sup> The most common underlying cause of acute intestinal obstruction in Western countries is postoperative adhesions;<sup>6-8</sup> however a number of studies had found obstructed-strangulated hernias to be the most common underlying cause of acute intestinal obstruction.<sup>5,9,10</sup> Intestinal tuberculosis as a commonest cause of intestinal obstruction has been found in other studies.<sup>11</sup> Volvulus of sigmoid and small bowel is the most common cause of mechanical intestinal obstruction in Kenya and Ethiopia.<sup>12,13</sup> This changing pattern of acute intestinal obstruction raises the need of further studies. Our study was conducted in Saudi

hospital at Hajjah governorate in Yemen between July 2012 and September 2014.

## Aim of the study:

This study is to explore whether there is a change in the spectrum of acute intestinal obstruction in our part of developing countries and to compare our results and outcome of management with the results obtained by other similar international studies.

## Patients and methods

All patients who presented with symptoms and signs of acute intestinal obstruction that were operated on in the Department of Surgery in Saudi hospital at Hajjah governorate in Yemen were included in this study. Those patients who were managed conservatively without surgical intervention were excluded.

Demographic data of patients, symptoms and signs, the interval between the onset of the symptoms and presentation to the hospital, results of imaging studies, intraoperative findings, causes of obstruction, type of procedure, and postoperative complications were prospectively collected and analyzed. All patients were admitted through the emergency department and were managed by two surgeons.

A chance of 48 hours of conservative management/ applying nasogastric decompression, fluid and electrolyte correction and broad-spectrum antibiotics/ was given for those patients with previous laparotomy. Failure of relief of obstruction necessitated us to perform surgical intervention.

The data were analyzed using Statistical package for social sciences IBM statistics SPSS version 22.

### Results

One hundred sixty four patients presented with acute intestinal obstruction underwent surgical intervention in the Department of Surgery in Saudi hospital at Hjjah governorate between July 2012 and September 2014. They were 101 men and 63 women. Male to female ratio was 1.6 : 1, age ranging from 1 day to 80 years old.

Totally, 16 factors were found to be the causes of acute intestinal obstruction in our study (**Table 1**).

Out of 16 causes, 5 causes were found in 139 patients (84.7%) that lead to intestinal obstruction. The

remnant 11 causes were distributed in 25 patients (15.2%). External strangulated-obstructed hernia was the most common cause of acute intestinal obstruction, in 48 patients (29.1%), followed by postoperative adhesions and peritoneal bands, in 39 patients (23.7%). Intussusception was the cause of acute intestinal obstruction in 20 patients (12.1%) to occupy the third place, while intestinal volvulus was the cause of intestinal obstruction in 17 patients (10.3%). Out of these cases, 1 case was complicated by pregnancy. Intestinal tumors were the cause of acute intestinal obstruction in 15 patients (9.1%). Among these patients 2 cases had small bowel gastrointestinal stromal tumors and other 2 cases had non-Hodgkins lymphoma of the ileum. Obstructing colon adenocarcinoma was found in the remaining 11 cases. Two of them were inoperable and led to death. Ascariasis blocking intestinal lumen was found in 3 patients (1.8%) (**Figure 1**). Rare causes that lead to intestinal obstruction such as: foreign body in the rectum, inappropriate intraperitoneal drain and duodenal web were also found (**Figures 2,3**). Different types of surgical procedures were used to solve different cases (**Table 2**). Postoperative complications were found in 44 patients (26.8%) with preponderance of wound infection and wound dehiscence (**Table 3**). Regarding the mortality, 15 patients (9.1%) died within the first postoperative week (**Table 4**).

Out of 15 cases, 2 cases due to inoperable metastasizing adenocarcinoma of the colon.

**Table 1: Pattern of causes of intestinal obstruction**

Causes of intestinal obstruction	Male n=101	Female n= 63	M+F n= 164	%
Strangulated hernias	32	16	48	29.2
Postoperative adhesions&bands	23	16	39	23.7
Intussusception	12	8	20	12.1
Intestinal volvulus	10	7	17	10.3
Mass of the colon	9	6	15	9.1
Imperforated anus	4	3	7	4.2
Intestinal tuberculosis	-	3	3	1.8
Ascariasis	2	1	3	1.8
Strangulating Meckle's diverticulum	2	1	3	1.8
Peritoneal stitch strangulating bowel loops	2	-	2	1.2
Vitello-Intestinal duct bands	2	-	2	1.2
Ogilvi's disease of the colon	-	1	1	0.6
Duodenal web	1	-	1	0.6
Mesenteric thrombosis	-	1	1	0.6
Postoperative pelvis drain	1	-	1	0.6
Foreign body/bottle/in the rectum	1	-	1	0.6
Total	101	63	164	100%

**Table 2: Type of procedures performed**

Type of procedure	No. of patients	%
1. Adhesiolysis and bands resection	36	22
2. Resection of gangrenous bowel & Primary anastomosis	28	17
3. Reduction of obstructed intestine	25	15.2
4. Hemicolectomy & primary anastomosis	15	9
5. Hartmann procedure	13	7.9
6. Intestine resection & Ileostomy	12	7.3
7. Volvulus reduction	7	4.2
8. Intussusception reduction	7	4.2
9. Release of strangulating stitches	2	1.2
10. Ascaris extraction	3	1.8
11. Anoplasty	7	4.2
12. Drain replacement	1	0.6
13. Meckle's diverticle excision	2	1.8
14. Duodeno-duodenostomy	1	0.6
15. Explorative laparotomy & biopsy	4	2.4
16. Extraction of foreign body from the rectum	1	0.6
Total	64	100%

**Table 3: Postoperative complications**

Complications	Patients n=44	26.8%
1. Wound infection and dehiscence	31	18.9
2. Pulmonary complications	5	3
3. Fecal Fistula	4	2.4
4. Short bowel syndrome	2	1.2
5. Incisional hernia	1	0.6
6. Cerebrovascular Accident	1	0.6
Total	44	26.8%

**Table 4: Causes of mortality related to the gender**

Cause of death	n=15	male	female	%
1. Strangulated hernia	7	3	4	4.2
2. Intussusception	2	2	-	1.2
3. Intestinal malignancy	2	1	1	1.2
4. Adhesions and peritoneal bands	2	1	1	1.2
5. Imperforated anus	1	1	-	0.6
6. Cerebrovascular Accident	1	-	1	0.6
Total	15	8	7	9.1%

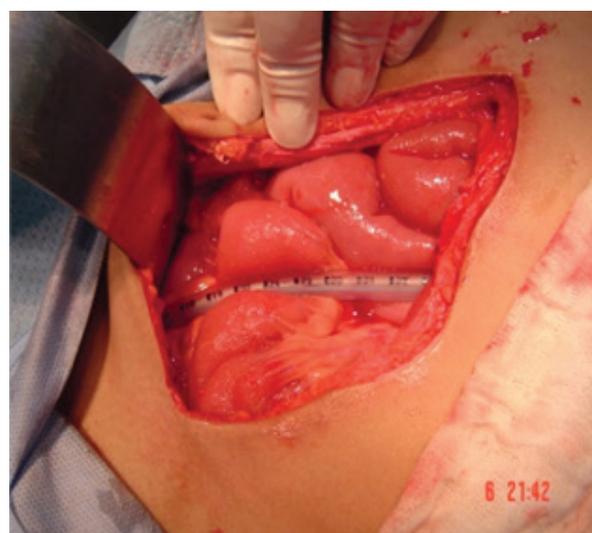
**Table 5: Comparison of our results with other similar international results**

Examples International studies	Hernias %	Adhesions %	Intussusception %	Volvulus %	Tumors %	TB %
1. M. S.Shaikh et al.2010, Larkana 2006-2009 (3.5 years)	25.83	23.33	2.5	10.83	10.83	10.83
2. Nasser A. Baloch et al.2011, J Sur. Pakistan (2 years)	17.5	22.6	-	11.5	15.9	30.6
3. Adesunkanmi et al 1996, East Afr.Med J 1985-1994 (9 years)	16.9	41.5	14.1	14.1	2.8	-
4. A. Malik et al 2010, Jamsharo Pakist. Saudi Gastr J (5 years)	18	41	-	3.9	2.1	25
5. Adel S. Mushari et al 2011, Iraq Basrah J Surg J (4 years)	21.3	51.7	9.7	8.8	9.9	3.6
6. Oladele AO et al 2008, Nigeria (5 years)	11.6	44.2	8.4	14.8	7.4	-
7. A-Bahllooli Saeed et al 2014, Yemen (2 years)	29.2	23.7	11.9	10.3	9.1	1.8

TB-Tuberculosis



**Fig 1: Ascaris obstructing small bowel.**



**Fig 3: Tube drain passing over the loops of intestine causing intestinal obstruction.**



**Fig 2: Glass Bottle in the rectum causing intestinal obstruction.**

### Discussion

The causes of intestinal obstruction not only vary from country to country, but also vary from area to another in the same country.<sup>4,5</sup> The most common underlying cause of acute intestinal obstruction in the Western countries is intraperitoneal adhesions (41.5%).<sup>6,8</sup> A number of studies had found obstructed/strangulated hernias to be the most common underlying cause of acute intestinal obstruction (25.83%);<sup>5,9,10</sup> while others found intestinal tuberculosis is the commonest cause of intestinal obstruction (30.6%).<sup>11</sup> This Changing pattern of underlying causes of the disease in different parts of the world including developing countries enforces many centers to explore the variation of underlying causes of intestinal obstruction and identify the different geographical etiological factors of the disease.

In this study, unlike western countries the strangulated/obstructed external hernias are the most common cause of intestinal obstruction (48 patients, 29.2%), followed by postoperative adhesions and bands (23.7%). This finding is consistent with some international studies,<sup>5,9,10,14,15</sup> however it differs from other studies.<sup>8,10,11,16</sup> This preponderance of strangulated hernias in our study is most likely due to late presentation of the patients to the hospital because of lack of awareness about this problem among general population and because of poverty and fear of surgical intervention. Lack of institutions that provide health care and difficult terrain in developing countries constitutes challenging factors and increase the number of patients presenting with complicated hernia.

Adhesive intestinal obstruction comes in the second place (39 patients, 23.7 %); while in western countries comes in first place.<sup>6-8</sup> Within this group primary peritoneal bands were the most common cause. Explorative laparotomies performed for abdominal gunshot were found to be the most common cause of postoperative peritoneal adhesions formation. Operations in the pelvis mainly Caesarian section increase intra-peritoneal adhesions formation that led to intestinal obstruction in our study. Unlike patients presenting with strangulated hernia, the patients with adhesive intestinal obstruction were first managed conservatively in hope to release the obstruction spontaneously. Those patients that improved with conservative management (insertion of nasogastric tube to decompress the gastrointestinal tract, intravenous fluid, correction of electrolytes imbalance) were discharged from the hospital within few days and were excluded from the study. This approach is still adopted by many other authors.<sup>16-18</sup>

Another cause of intestinal obstruction in the present study is intussusception that all occurred in children. A total of 20 (12.1%) patients with intussusception were presenting with intestinal obstruction. This ratio is higher than some studies<sup>9-11,19,20</sup> and lower than others.<sup>8,21</sup>

The obstruction occurs when proximal segment of bowel invaginates into the distal bowel resulting in venous congestion and consequently intestinal wall oedema.<sup>22</sup> Lymphadenopathy was almost constant finding in the majority of patients.

Volvulus of the colon and small intestine caused intestinal obstruction in 17 patients (10.3%) and comes in the fourth place. This ratio is consistent with some international studies.<sup>8-11,16</sup> Tumors obstructing the lumen of intestine came in the fifth place (15 patients; 9.1%). This ratio is lower than reported by Nasser A.B<sup>11</sup> (15.9%), however Lee

SH et al<sup>23</sup> reported malignancy as the commonest cause of intestinal obstruction in Malaysia. **(Table 5)** shows a comparison of the five leading causes of intestinal obstruction in our study with similar international studies.

Other causes of acute intestinal obstruction are rare and comprise insignificant ratio. One male patient with glass bottle situated high in the rectum presented 2 days after the event. In addition to surgical extraction through laparotomy he required colostomy because of severe laceration of the rectum. Regarding peritoneal drain that caused intestinal obstruction, it was badly exteriorized during the previous operation for generalized peritonitis. Instead of pulling the drain out through skin incision in right iliac fossa, it was pulled out through incision in left hypochondrium crossing over and compressing upon the small intestine and transverse colon. This led to intestinal obstruction requiring re-exploration of the abdomen and correction of drain position.

### Conclusion

Unlike western countries, strangulated/ obstructed external hernias were the most common cause of intestinal obstruction in our study, followed by adhesive pattern and then came intussusception, intestinal volvulus and intestinal tumors respectively.

Increasing the patient awareness and making the surgical services easily reachable will help to decrease the incidence of complicated hernias.

Despite the improvement of health care services and common use of antihelminthic agents nowadays, the physicians are advised to suspect parasites such as ascaris as a possible cause of intestinal obstruction especially in warm climates and where socioeconomic situation and hygiene level is low.

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