A study on the pathology of acute intestinal obstruction in Upper Egypt.

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Abstract

Acute intestinal obstruction remains a major clinical presentation of Egyptian patients in Upper Egypt. The current study was conducted to speculate on cases of acute intestinal obstruction from a clinico-histopathological point of view. The study was retrospective, included 186 patients presented with acute intestinal obstruction during the period from January 2009 to December 2017. Male patients were a bit more commonly affected than females. It is apparent from this study that acute on top of chronic intestinal obstruction is still a major problem. The research was aiming at finding the most common histopathological findings in representative cases of acute intestinal obstruction. Adenocarcinoma of the intestine took the priority of cases in the represented biopsies (27%), followed by reactive hyperplasia of mesenteric lymph nodes (10%), non-Hodgkin's lymphoma (7%) and mesenteric vascular occlusion (5%). We observed that patients with biopsy diagnosis as adenocarcinoma and non-Hodgkin's lymphoma had been complaining of symptoms of chronic intestinal obstruction over many years before the development of acute obstruction. So, from this point, the doctors in all specialties (gastroenterology, surgery, and histopathology) must consider cases of chronic intestinal obstruction seriously, as these lesions often predispose to acute intestinal obstruction. They should always keep on eye to guard against any complication including acute intestinal obstruction. From this study, we could determine many pathological effects of acute intestinal obstruction such as hemorrhagic infarction, gangrene of the intestine and peritonitis. These effects represented in our study about (12%) of the studied cases, half of these cases presented by hemorrhagic infarction of intestine. For affected patients, high-quality surgical expertise coupled with sound clinical judgment and early surgery when needed, confirmed with the histopathological diagnosis will greatly prevent complications and improve survival. Furthermore, a general improvement in healthcare infrastructure, especially in the rural communities, could further reduce mortality as patients may then present early.

Keywords: Obstruction, Adenocarcinoma, Infarction.

Accepted on February 21, 2018

Introduction

Intestinal obstruction involves a partial or complete blockage of the intestine that results in the failure of the intestinal contents to pass through [1]. The obstructing mechanism can be mechanical or non-mechanical. Mechanical factors can be anything that causes a narrowing of the intestinal lumen (e.g., inflammation or trauma to the bowel, neoplasms, adhesions, hernias, volvulus, or a compression from outside the intestinal tract [2] Non-mechanical factors include those that interfere with the muscle action or innervation of the bowel: paralytic ileus, mesenteric embolus or thrombus, and hypokalemia.

Eighty percent of bowel obstructions occur in the small intestine; the other 20% occur in the colon [3]. Intestinal obstructions are frequently seen in the ileum. Small intestinal obstructions are caused frequently by adhesions or hernias, whereas large intestinal obstructions are caused commonly by carcinomas, volvulus, or diverticulitis. The presentation of obstruction will relate to whether the small or large intestine is involved. The most common malignancies that cause bowel obstruction are cancers of the colon, stomach, and ovary. Extra-abdominal cancers (such as lung and breast cancers and melanoma) can spread to the abdomen, causing intestinal obstruction [4]. Patients who have had abdominal surgery or abdominal radiation are also at higher risk of developing intestinal obstruction. Intestinal obstructions are most common during advanced stages of disease [5].

Patients generally present with abdominal pain, nausea and emesis, abdominal distention, and progressive constipation. Clinical findings of high fever, localized severe abdominal tenderness, rebound tenderness, severe leukocytosis, or metabolic acidosis suggest possible complications of bowel necrosis, bowel perforation, or generalized peritonitis [6]. If left untreated, intestinal obstruction can cause serious complications. As the intestine becomes congested, its ability to absorb food and fluids decreases. Decreased absorption may cause vomiting, dehydration and, eventually, can result in kidney failure, which may cause shock. Intestinal obstruction can also cut off the blood supply to the affected portion of the intestine. If left untreated, lack of blood causes the intestinal wall to die it could result in infection and/or gangrene. Tissue death can result in a perforation of the intestinal wall, which can lead to peritonitis which leads to shock [7].

Intestinal obstruction is a serious medical emergency need rapid intervention. Management options include medical therapy, surgical therapy, endoscopic therapy and interventional

radiologic therapy. Self- expandable metal stents (SEMS) have gained acceptance for alleviating acute malignant colonic obstruction and in some situations for the pre-operative relief of acute benign colonic obstruction [8].

This study is done aiming at:

1. Speculation of the common causes of acute intestinal obstruction in Upper Egypt.

2. Exploration of the types of lesions that cause the obstruction.

3. Determination of the pathological effects of obstruction in terms of infarction, gangrene, hemorrhage, toxemia, extra.

Materials and Methods

The present study was undertaken at the General Histopathology Laboratory, Pathology Department, Assuit University Hospitals, Assuit. Records and paraffin blocks of one hundred and eighty-six cases presented with acute intestinal obstruction and submitted for histopathological diagnosis during the period from January 2009 to December 2017 were retrieved and revised for speculating the common causes of acute intestinal obstruction and the pathological effects of the obstruction.

Clinical information

Clinical data were retrieved from the clinical referral reports for all cases including age and sex of patients as well as the clinical presentations and the operative findings of each case.

Histopathological information

The H&E stained sections were examined and additional paraffin sections were prepared when required. Each case was revised and the histopathological findings of each case were recorded. The histopathological, the clinical and the operative findings are tabulated and simple correlation between each finding is extracted from these tables to outline the pattern of acute intestinal obstruction in Upper Egypt.

Results

This study was undertaken primarily to establish the causes of acute intestinal obstruction, explore different types of lesions responsible for obstruction and find out various pathological effects of intestinal obstruction in upper Egyptian patients. One hundred and eighty-six cases presented with acute intestinal obstruction were delivered to histopathology laboratory of Assiut University throughout the nine-year period from January 2009 to December 2017.

They were 98 males and 87 females with a male to female ratio 1.1:1. Figure 1 shows the age distribution of cases presented with acute intestinal obstruction. There were two peaks of age found in the present study. The first and sixth decades of life represented the most common ages of presentation, representing (19%) of cases for each decade. The most common causes of acute intestinal obstruction in the first decade of life found in the present study are Non-Hodgkin's lymphoma and reactive hyperplasia of mesenteric lymph nodes representing (19.4%) of total cases presented at this age for each cause. However, in the fifth decade of life neoplastic lesions (adenocarcinoma) were found to be the most common cause of acute intestinal obstruction representing (47.2%) of total cases presented at this age.

Regarding the clinical presentations of the studied cases, we found that most cases of acute intestinal obstruction, (86%) were on top of chronic intestinal obstruction, (6.5%) were due to adhesive intestinal obstruction, (3.2%) were due to strangulated hernia, (3.2%) were due to intussusception and (1%) were due to volvulus (Figure 2). In (76%) of the studied cases the cause of acute intestinal obstruction was intestinal in origin. However, the remaining group (24%) the obstruction was due to extraintestinal causes e.g. bands of adhesions, peritoneal causes, retroperitoneal mass, pelvic masses and ovarian metastases. There were many operative findings found in cases of acute intestinal obstruction but the most common operative findings in our study was colonic masses which represents (25%), followed by gangrenous loops of intestine (11%), mesenteric lymph nodes enlargement (10%), small intestinal masses (9%) and intestinal perforation (8.6%). After histopathological examination of representative biopsies for each case of acute intestinal obstruction, we found that the most common type of lesion causing acute intestinal obstruction was adenocarcinoma of the intestine (27%) followed by reactive hyperplasia of mesenteric lymph nodes (10%), Non-Hodgkin's lymphoma (7%) and mesenteric vascular occlusion (5%). We also observed that the most common effect of acute intestinal obstruction was hemorrhagic infarction of intestine (6%) (Table 1).

Discussion

Acute intestinal obstruction remains a frequently encountered problem in abdominal surgery and a common surgical emergency [9], which is a frequent cause of admissions to hospital emergency surgical departments [10]. Acute intestinal obstruction may occur at any age and may be mechanical or dynamic, simple or strangulated; may occur in the small or large intestine [11].

In our study group; there is the slight prevalence of cases of acute intestinal obstruction in males over females with a ratio 1.1:1. A finding is consistent with previous studies [12-16] However, other studies have opposite results were females

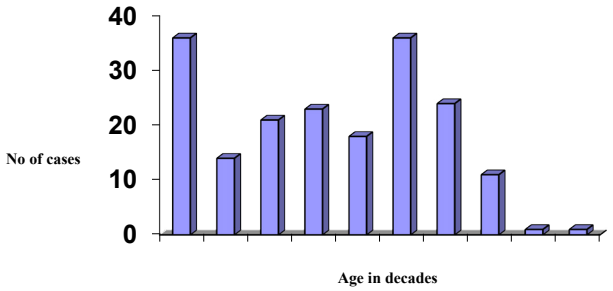

Figure 1. *Age distribution of 186 cases of acute intestinal obstruction.*

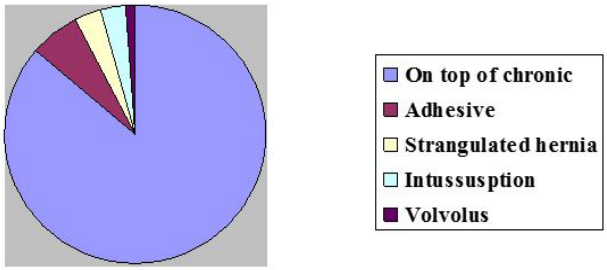

Figure 2. *Clinical presentations of 186 cases of acute intestinal obstruction.*

Table 1. *Demonstrates the histopathological findings in cases presented by acute intestinal obstruction.*

Histopathological findings	**Number of cases**
Causes	
Adenocarcinoma	**50**
Adenocarcinoid	1
Mucoid carcinoma	5
Signet ring carcinoma	2
Metastatic adenocarcinoma	8
Undifferentiated carcinoma	1
Non Hodgkin lymphoma	**13**
Carcinoid tumor	2
Malignant GIST	1
Lipoma	1
Lymphangioma	2
Villous adenoma	1
Adenomatous polyp	1
Hyperplastic polypi	1
Inflammatory fibroblastic polyp	1
Peutz jegher polyp	4
Inflammatory pseudotumor	2
Chron's disease	5
Ulcerative colitis	1
Tuberculosis	5
Bilharziasis	1
Foreign body granuloma	2
Acute supurative appendicitis	1
Chronic non-specific inflamation	2
Meckel's diverticulum	2
Intestinal diverticulae	2
Adhesions	2
Ectopic pancreatic tissue within the submucosa of the intestine	1
Congenital megacolon (Aganglosis)	3
Necrotizing enterocolitis	2
Marked lymphoid hyperplasia	7
Reactive hyperplasia of mesenteric LN	**18**
Mesenteric vascular occlusion	**10**
Fat necrosis	1
Congestion, oedema, mucosal ulceration of intestine	4
Effects	**No. of cases**
Hemorrhagic infarction	**11**
Peritonitis	6
Gangrene	4

more commonly affected than males [17-20]. These findings of different studies are demonstrated in Tables 2 and 3. From Table 2 we observed that studies done by Feldman et al., Fevang et al. and Franklin et al. [21-23] showed the wider incidence of occurrence of acute intestinal obstruction between males and females. Regarding the age of our patients, the first and sixth decades of life represent the most common age of presentation by acute intestinal obstruction. After comparison of our results with results of other literature we found variability in most common age of presentation, two of these studies are inconsistent with our study [24]. However other studies which made by Glenn et al. [25] showed different age incidence. In these studies, acute intestinal obstruction more commonly occurs in fourth and seventh decades of life (Table 3). These findings might be due to the group of study. Regarding the clinical presentations of the studied cases, we found that nearly all the cases presented by an acute intestinal obstruction on top of chronic (86%) and this finding is consistent with result observed by Gollub [26] in his study. However, other studies done by Gürleyik [27] found that adhesive intestinal obstruction is the most common cause which may represent late presentation of the cases of inflammatory and malignant conditions affected intestine and due to increased incidence of post-operative adhesions. Strangulated hernia represents the major cause of acute intestinal obstruction in studies done by Paran, Harouna and Harris [28-30] (Table 4). I think most of these groups are Japanese where colonic cancer is not common in this community since it was the most common cause of intestinal obstruction in our study group. Small intestinal obstruction represents the most common site of intestinal obstruction (37.1%) in our study group and this result is in agreement with all other studies done by Herbert, Hladik and Horton [31-33] (Table 5). Regarding the histopathological findings, only a few studies on acute intestinal obstruction have described the histopathological findings in their results, as they classified their causes as neoplastic and non-neoplastic findings but not in detail. In the studied cases we found that adenocarcinoma is the most common cause of acute intestinal obstruction (27%) [neoplastic and non-neoplastic causes] and it is mostly presented by colonic masses (20%), and after correlation of this result with other results of few studies did on the histopathological aetiologies of acute intestinal obstruction we found that [34] are in agreement with us that adenocarcinoma is the most common neoplasm causing intestinal obstruction however, study which done by in Italy found that lymphoma is the most common neoplasm causing intestinal obstruction, however, in our study lymphoma represents the second common cause of intestinal obstruction after adenocarcinoma (7%) and mainly presented by small intestinal masses (4%) (Table 6). This finding due to demographic distribution of cancer and also probably due to the difference in the age of the study group [35-42].

Metastatic adenocarcinoma is the third cause of intestinal obstruction in the present study representing (4.3%) and all these cases are presented as extraintestinal masses predispose to intestinal obstruction mostly as omental masses (37.5%),

Table 2. *Demonstrates sex distribution in different studies on acute intestinal obstruction.*

Study, author and year	**Male: Female ratio**	**Study group**
Present study	1.1 : 1	186
Jenkins JT et al., (2000)	1.02 : 1	103
Wysocki A and Krzywoń J, (2001)	1 : 1.3	468
Ihedioha U et al., (2006)	1 : 1.6	161
Akcakaya et al., (2006)	2.8 : 1	155
Ohene-Yeboah et al., (2006)	1.7 : 1	652
Markogiannakis H et al., (2007)	1 : 1.5	150
Madziga AG and Nuhu AI, (2008)	2.4 : 1	372

Table 3. *Demonstrates age distribution of acute intestinal obstruction in different studies.*

Study, author and year	**Most common age of presentation**
Present study	First and Sixth Decades
Jenkins JT et al., (2000)	Sixth Decade
Akcakaya et al., (2006)	Sixth Decade
Markogiannakis H et al., (2007)	Seventh Decade
Madziga AG and Nuhu AI, (2008)	Fourth Decade

Table 4. *Demonstrates the clinical presentations of acute intestinal obstruction in different studies.*

Study, author and year	Acute on top of chronic intestinal obstruction	Adhesive intestinal obstruction	Strangulated hernia	Intussusception	Volvulus	Miscellaneous (others)
Present study	**86%**	6.5%	3.2%	3.2%	1%	-
Miller G et al., (2000)	11.5%	**47%**	2%	-	1.08%	10.8%
Jenkins JT et al., (2000)	33%	**-**	11%	-	18%	**46%**
Wysocki A and Krzywoń J, (2001)	24.8%	25.2%	**50%**	-	-	-
Ihedioha U et al., (2006)	10.6%	**60.2%**	18%	-	-	11.2%
Akcakaya et al., (2006)	**74.8%**	-	4.5%	1.3%	9.6%	9.6%
Ohene-Yeboah et al., (2006)	3%	27%	**63%**	-	5.8%	-
Markogiannakis et al., (2007)	18.6%	**64.6%**	14.6%	-	1.3%	0.66%
Madziga AG and Nuhu AI, (2008)	9.14%	26.6%	**35%**	21.5%	2.95%	-

Table 5. *Demonstrates different sites of acute intestinal obstruction in different studies.*

Study, author and year	Small intestinal	Large intestinal	Both	Extra intestinal	Study group
Present study	37.1%	35.4%	-	24%	186
Franklin ME et al., (2004)	69%	26%	-	-	167
Catena et al., (2005)	91.1%	8.8%	-	-	39
Akcakaya et al., (2006)	59.3%	34.2%	6%	-	155
Markogiannakis H et al., (2007)	76%	21.3%	-	2.7%	150

Table 6. *Demonstrates histopathological findings of cases presented by an acute intestinal obstruction in different studies.*

Study, author and year	Histopathological findings								
	Neoplastic				Non-neoplastic				others
	Adenocarcinoma	Lymphoma	Carcinoid	Metastases	IBD	TB	Diverticulum	Adhesions	
Our study	**27%**	7%	1.1%	4.3%	3.2%	3%	2.14%	1.07%	51.5%
Jenkins JT et al., (2000)	-	-	-	19%	14%	-	7%	-	60%
Miller G et al., (2000)	5%				7%	1%	1%	**47%**	39%
Wysocki A and Krzywoń J, (2001)	**96.4%**	-	-	3.6%	-	-	-	-	-
Catena et al., (2005)	20.6%	**26.5%**	20.6%	8.8%	-	-	-	-	23.5%
Akcakaya et al., (2006)	**71.7%**	2.2%	-	26%	1.3%	3%	4%	-	-

disseminated intra-abdominal malignancy (25%) and (12.5%) were from peritoneal seedlings, retroperitoneal masses, and ovarian metastases [43-50]. Mucoid carcinoma represented (3%) of the present studied cases and operatively represented mostly by colonic masses. Carcinoid tumor and signet ring carcinoma are the histopathological findings in 2% of cases. 0.5% of the studied cases is considered the percentage of each undifferentiated carcinoma, malignant GIST, and adenocarcinoid tumor [51-62]. Benign neoplastic lesions presented by acute intestinal obstruction represent about 5.6% of cases. They were either polyps (4%), lymphangioma (1.1%) and (0.5%) of the studied cases for each lipoma and villous adenoma. Inflammatory conditions in different forms represent (10%) of cases. Crohn's disease and tuberculosis of the intestine were the most two common two causes of inflammatory conditions causing acute intestinal obstruction representing about (53%) of inflammatory cases.

Diverticulae are confirmed histopathologically as 2% of cases presented by acute intestinal obstruction, half of these cases are intestinal obstruction due to Meckel's diverticulum [63-72]. Intestinal adhesions are confirmed histopathologically in about 1% of cases presented by adhesive intestinal obstruction. In a study published by Miller and his colleagues in 2000 in Montreal, Canada shows that adhesions in their histopathological findings represent the most common cause of acute intestinal obstruction (Table 6).

In 4% of the studied cases marked lymphoid hyperplasia in the intestinal wall was the cause of acute intestinal obstruction and it has two forms of presentation operatively as intestinal masses and intestinal perforations. Reactive hyperplasia of mesenteric lymph nodes predisposes to acute intestinal obstruction in 10% of the studied cases and all these cases found operatively as enlarged mesenteric lymph nodes [73-80]. Mesenteric vascular occlusion was found in 0.5% of the studied cases of acute intestinal obstruction. Neonatal intestinal obstruction was presented histopathologically as congenital megacolon, necrotizing enterocolitis in about 14% of presented by an acute intestinal obstruction in the first decade of life. In 11.3% of cases of acute intestinal obstruction were presented by complications in form of hemorrhagic infarction (6%) of cases, peritonitis (3.2%) and gangrene (2.1%) [81-86].

Conclusion

From this study, we could determine many pathological effects of acute intestinal obstruction such as hemorrhagic infarction, gangrene of the intestine and peritonitis. These effects

represented in our study about (12%) of the studied cases, half of these cases presented by hemorrhagic infarction of intestine. For affected patients, high-quality surgical expertise coupled with sound clinical judgment and early surgery when needed, confirmed with the histopathological diagnosis will greatly prevent complications and 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.

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