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Adult large bowel obstruction: A review of clinical experience

A. Z. Sule, A. Ajibade

Department of Surgery, Jos University Teaching Hospital, Jos, Nigeria

Correspondence to: Dr. A. Z. Sule, P.O. Box 297, Jos, Plateau State, Nigeria. E-mail: augsule@yahoo.com

Abstract

Background: Adult large bowel obstruction is an infrequent cause of acute obstruction in Africa and India. The cause of obstruction varies between regions of the world. Current controversy concerns the surgical management of the acutely obstructed left colon.

Materials and Methods: This is a prospective study of adult patients with acute large bowel obstruction over a 6-year period. The diagnosis of adult obstruction was made from a history of constipation, abdominal distension, abdominal pain, nausea, and radiographic features of large bowel obstruction. Laparotomy was performed on all patients after resuscitation. If the obstruction involved the right colon resection and primary ileo-colic anastomosis was performed, while for a lesion in the left colon a resection and primary colocolic anastomosis was performed after intraoperative antegrade colonic irrigation. If the obstructing lesions were thought to be malignant and too advanced to merit any excisional or the patient's general condition was too poor to withstand resection, a biopsy was taken and a decompressive bypass procedure given pending the confirmation of the diagnosis. The clinical course and postoperative outcome were carefully documented.

Results: A total of 50 patients aged 20-80 years, with a median age of 49 years, presented with features consistent with large bowel obstruction. Of these, 32 had simple sigmoid volvulus and were offered sigmoid colectomy and primary colorectal anastomosis, while 3 further patients with compound sigmoid volvulus had double resection with primary ileo-ileal and colorectal anastomosis. A patient with sigmoid volvulus had a Hartmann's procedure. Twelve patients had colon cancer, four had left hemicolectomy and primary colocolic anastomosis; three, sigmoid colectomy and primary colorectal anastomosis; three, low anterior resection and primary colorectal anastomosis; one decompressive colostomy and one, a right hemicolectomy and primary ileocolic anastomosis. The two patients with functional obstruction (Ogilvie syndrome) had tube caecostomy. All resections and primary anastomosis involving the right colon were preceded by antegrade on-table colonic lavage. One clinical anastomotic leak occurred in a low rectal anastomosis and minor wound infection in 10 patients. Operative mortality occurred in three patients with sigmoid volvulus.

Conclusion: Adult large bowel obstruction is infrequent in our community and is caused commonly by sigmoid volvulus. Resection and primary anastomosis of the acute left-sided large bowel obstruction seems safe after antegrade on-table colonic lavage, provided bowel gangrene with peritonitis or any additional risk factor for anastomotic breakdown is not present.

Keywords: Adult, large bowel, obstruction

Résumé

Fond: occlusion intestinale grand adultes est une cause rare d'obstruction aigue dans Afrique et l'Inde. La cause de l'obstruction varie entre les régions du monde. Actuel controverse concerne la gestion chirurgicale de l'obstruction aiguë du côlon gauche.

Méthodes: Il s'agit d'une étude prospective des patients adultes atteints d'obstruction aiguë gros intestin sur une période de 6 ans. Le diagnostic d'adulte obstruction a été faite d'une histoire de la constipation, la distension abdominale, abdominale douleurs, des nausées et des caractéristiques radiographiques du gros intestin obstruction.

Laparotomie a été effectuée sur tous les patients après la réanimation. Si l'obstruction impliqué la résection du côlon droit et primaire anastomose iléo-colique a été effectuée alors que pour une lésion dans le côlon gauche une résection et primaire anastomose colocolic a été effectuée après l'irrigation colique Anterograde peropératoire. Si les lésions obstruction ont été considérées comme des malins et trop avancé au mérite tout excision ou le patient du général condition était trop pauvre pour supporter la résection, une biopsie a été prise et une procédure de contournement décompressive donné dans l'attente de la confirmation de la diagnostic. L'évolution clinique et le résultat postopératoire ont été soigneusement documentés.

Résultats: Un total de 50 patients âgés de 20 à 80 ans avec un âge médian de 49 ans a présenté avec des fonctionnalités compatibles avec obstruction du gros intestin. Trente-deux avait volvulus sigmoïde simple et ont été offerts à la colectomie sigmoïde et primaire anastomose colorectal alors que 3 autres patients avec composé volvulus sigmoïde double résection avec anastomose iléo-iléale et colorectal primaire. Un patient atteint de volvulus sigmoïde avait procédure d'un Hartmann. Douze patients avaient cancer du côlon, quatre avaient quitté hemicolectomy et colocolic primaire anastomose; trois, colectomie sigmoïde et anastomose colorectal primaire; trois, faible résection antérieure et anastomose colorectal primaire; une colostomie décompressive et l'autre, un droit hemicolectomy et l'anastomose célà primaire. Les deux patients ayant une obstruction fonctionnelle (Ogilvie syndrome) avaient tube caecostomy. Tous les résections et primaire anastomose impliquant le côlon droit ont été précédés d'Anterograde sur table colique lavage. Une fuite anastomotique clinique s'est produite dans un faible anastomose rectale et les plaies mineures infection chez les patients de 10. Le taux de mortalité s'est produite dans trois patients avec volvulus sigmoïde.

Conclusion: Occlusion intestinale grand adultes est peu fréquente dans notre communauté et est causée communément par volvulus sigmoïde. Résection et anastomose primaire de l'obstruction aiguë gauche faces gros intestin semble sécuritaire après lavage colique d'Anterograde sur table, condition de l'intestin gangrène avec péritonite ou tout facteur de risque supplémentaire de ventilation anastomotique n'est pas présent.

Mots clés: Adulte, gros intestin, obstruction

Introduction

In the western world, adult acute large bowel obstruction commonly due to colon cancer occurs in elderly and frail patients with intercurrent medical illnesses. It continues to be a lethal disease, with little overall improvement in mortality rates over the past 40 years.[1,2] It constitutes approximately 15% of intestinal obstruction in the western world.[3] In Africa and India, volvulus of the large bowel is the primary cause of obstruction (50%), and there is low incidence of obstructing colon cancer in these areas.[4,5] The patients in these areas are usually young and healthy.[2] The current controversy in the management of left-sided large bowel obstruction centres on the risk involved in primary resection and anastomosis. Although several studies have considered the aetiology, management, and outcome of large bowel obstruction in the developed world, with some suggesting a move towards definitive surgery for left-sided large bowel obstruction,[6-9] few have reviewed this condition in developing countries. In order to determine the aetiology, management, morbidity, and mortality of adult acute large bowel obstruction, we undertook a 6-year prospective study in a tertiary referral centre in Jos, Northern Nigeria.

Materials and Methods

Fifty consecutive adult patients with acute large bowel obstruction were treated during the period under consideration (*May 1993 to May 1999*) in Jos University Teaching Hospital, Jos, Plateau State, Nigeria. The diagnosis of acute large bowel obstruction was made from a history of constipation, abdominal distention, abdominal pain, nausea, and radiographic features of large bowel obstruction. Sigmoid volvulus was likely when the above symptoms were recurrent and plain abdominal radiograph showed the cardinal features of the inverted 'coffee bean' or 'omega' sign of the distended, twisted colon.[2] Common presenting complaints included abdominal pain, vomiting, nausea, distention, and constipation in large bowel tumours. Distention, change in bowel sound, and tenderness were the most common physical findings in the latter case. Laparotomy was performed on all patients after active fluid resuscitation, correction of any electrolyte and acid-base disturbances, and establishment of satisfactory urine output (*catheter monitoring*). Gentamycin 2 mg/kg body weight, Ampicillin 500 mg and metronidazole 500 mg were administered intravenously at the time of induction of anaesthesia. Two more doses were given every 8 hours in those with viable bowel and for 5 days in those with infarcted bowel. At laparotomy, viability of the bowel was assessed by wrapping the obstructed loop of bowel in a warm saline-soaked pack and inspecting for colour, mesenteric pulsations and peristalsis several minutes later. Gaseous distention of the bowel was relieved by needle or Foley catheter aspiration. Resection was carried out for all sigmoid volvulus

and resectable colorectal obstructing lesions. The site of obstruction was defined as being in the right side of the colon if the lesion involved the bowel up to but not involving the splenic flexure. Primary ileocolic anastomosis was performed with no form of bowel preparation carried out. However, for left-sided lesions defined as obstruction in or distal to the splenic flexure, on-table intraoperative antegrade colonic irrigation as described by Dudley *et al*.[9] was used to clear the colon of faecal matter before colocolic or colorectal anastomosis were affected. If the left-sided obstructing lesions were thought to be malignant and too advanced to merit any excisional surgery, a biopsy was taken and a decompressive transverse colostomy given, pending the histological confirmation of the diagnosis. Decompressive colostomy was also considered if the patient's general condition was too poor to withstand resection, colonic lavage and primary anastomosis. None of the primary anastomosis were protected by a proximal stoma. A corrugated drain was inserted through a separate stab incision. The vertical midline incisions were closed by mass closure using monofilament nylon one. The clinical course and postoperative outcome were carefully documented. Wound infection was defined as the presence of pus either discharging spontaneously or requiring drainage. Samples of wound discharges were obtained for bacteriological culture. Anastomotic leak was defined as the presence of a faecal fistula or anastomotic breakdown seen either at sigmoidoscopy, laparotomy following peritonitis or at postmortem. Hospital stay was defined as the total time spent in the hospital for the present complaint and, if necessary, for a subsequent procedure; mortality was considered as death occurring in hospital.

Results

Adult acute large bowel obstruction constituted 50 (14%) of the 361 cases of acute bowel obstruction over a 6-year period at our centre. Of these, 72% were due to sigmoid volvulus, while 24% were due to large bowel cancer. Two cases (4%) were due to functional obstruction. In one, the dilated colon ended abruptly at the splenic flexure and in the other, at rectosigmoid junction. The ages of the patients were in the range 20-80 years, with a median age of 49 years. The age distribution is shown in Figure 1. The male to female ratio was 3:1. The common clinical symptoms and signs are presented in Tables 1 and 2. Only 25 of our patients whose diagnosis could not be conclusively established on clinical ground had plain abdominal radiography. Those patients who had sigmoid volvulus described symptoms lasting a week or less, while those with large bowel cancer were ill for about a month before becoming

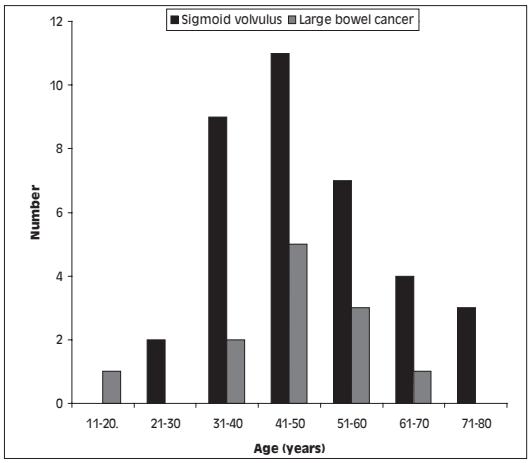

Figure 1: Age distribution in the 50 patients.

suddenly obstructed. In the latter, the common site of obstruction was descending and sigmoid colon present (8 patients). There were 45 cases of simple obstruction and 5 strangulations with gangrenous bowels; all in patients with redundant sigmoid volvulus, three of which were compound. All 12 patients with malignant obstruction had advanced (Astler Collar modification of Dukes CI and II) but resectable disease. The surgical procedures carried out are indicated in Table 3. There was one clinical anastomotic leak with faecal peritonitis in a patient who had a low anterior resection and 10 superficial wound infections. The clinical leak was closed and a transverse loop colostomy given at a second laparotomy. All wound infections resolved with antibiotics and daily wound dressing.

The duration of hospital stay was in the range 7-25 days. The volume of fluid (normal saline/ Hartmann) required to achieve a colon free of faeces and debris was in the range was 1.5-5.0 L. The time taken to achieve such a colon was in the range 25-50 minutes. There were 3 mortalities (6%) in patients with sigmoid volvulus. At last follow-up (10 months) all patients were alive except three patients. All deaths in those patients with colorectal carcinoma were due to the effects of the disease ranging from pulmonary metastasis to liver metastasis. This gives an overall mortality of 12%.

Discussion

Adult large bowel obstruction still remains an infrequent cause of acute bowel obstruction in this community. In our geographical area, the present study has revealed that the aetiologic background has also not changed significantly, as volvulus of the sigmoid colon is the primary cause of obstruction, and there is a low incidence of obstructing colon cancer. Sigmoid volvulus occurred in those with

Table 1: Presenting symptoms

Sigmoid volvulus	n	Large bowel cancer	n	Functional obstruction	n
Symptoms		Symptoms		Symptoms	
Pain	36	Pain	12	Pain	
Distention	35	Distention	11	Distention	2
Constipation	35	Constipation	11	Constipation	2
Nausea	27	Weight loss	10	Vomiting	2
Vomiting	25	Vomiting	8		1
Anorexia	7	Nausea	7		
		Tenesmus	6		
		Anorexia	4		

Table 2: Presenting signs

Signs	Sigmoid volvulus (n)	Large bowel cancer (n)	Functional obstruction (n)
Distention	36	12	2
Altered bowel sound	36	12	2
Tenderness	36	10	1
Haematochezia	0	6	0
Rectal mass	0	5	0

long sigmoid mesenteries and narrow mesentery attachment, as observed in previous studies.[2,5,10] Although aetiologically important, especially in rare childhood cases,[11] dietary factors are also a contributing factor.[10,12] In developing countries, a high-fibre cereal diet commonly eaten is responsible for the high incidence of sigmoid volvulus.[10,12,13]

There was no appreciable difference in site distribution of obstruction in patients with colon cancer in our series over that reported previously.[14,15] There were also no identifiable premalignant lesions in resected specimens, thus suggesting premalignant lesions, eg, adenoma, familial adenomatosis, polyposiscoli, etc, may not be usual associations in our environment as documented in western literature.[16] This could explain the reason for the rarity of colon cancer in our environment. The average age group affected was also lower (47 years) in our patients compared to 65 years in published series from the western world.[1,17] In the younger population, the disease carries a poor prognosis.[16,18] This could be another reason for the poor prognosis of this disease in our environment.

Current controversy concerns surgical management of the acutely obstructed left colon. Most surgeons believe that primary resection and anastomosis of the obstructed right colon is acceptable. However, the mortality rate for this treatment has been reported to be as high as 33%,[19] most investigators have noted a mortality rate in the range of 16-20%.[6,7] Primary resection and anastomosis in one of our patients with caecal tumour was uneventful. Primary left colon resection for acute obstruction has been reported to have a mortality rate as high as 60%.[7,17] Despite this, some surgeons including Fielding and coworkers have described favourable experiences with primary left colon resection.[8,20] Fielding and coworkers concluded that primary resection of a left-sided lesion be considered in all patients with acute obstruction.[7] Employing this treatment option, mortality rate was 6% in our patients, and in those with sigmoid volvulus. Two of these patients had gangrenous bowel but no established peritonitis. They underwent single resection and primary anastomosis after resuscitation as practiced by some surgeons.[8] In these patients, the uninvolved colon was not inflamed and non-friable. They, however, died from septic causes on the first postoperative

Table 3: Operative procedures, morbidity and deaths in 50 patients

Sigmoid volvulus Procedure	No. of patients	Wound infection	Anastomotic dehiscence	Death
Resection and primary colorectal anastomosis				
Double resection with primary ileo-	32	5	-	2
ileal and colorectal anastomosis	3	2	-	-
Hartmann's procedure	1	-	-	1
Large bowel cancer				
Left hemicolectomy and primary colocolic anastomosis	4	1	-	-
Sigmoid colectomy and primary colorectal anastomosis	3	-	-	-
Low anterior resection and primary colorectal anastomosis	3	1	1	-
Decompressive colostomy	1	1	-	-
Right hemicolectomy and primary ileocolic anastomosis	1	-	-	-
Functional obstruction (Ogilvie syndrome)				
Tube caecostomy	2	-	-	-

day. Resection and primary anastomosis after colonic irrigation was the preferred option in patients with sigmoid volvulus because of unlikelihood of recurrence associated with it. Furthermore, mortality following emergency surgery for acute sigmoid volvulus is low in the developing world despite debilitation resulting from delayed presentation.[10,21,22] The 70-year-old man who had undergone Hartmann's procedure died suddenly a week after surgery. He had documented pre-existing cardiopulmonary disease. The cause of death was not confirmed by a postmortem examination. The clinical anastomotic leak was also low in those having one stage procedure. The only clinical anastomotic dehiscence involved less than a quarter of the diameter of the colorectal anastomosis. The leak was closed and a proximal transverse loop colostomy given to avoid a subsequent more difficult and demanding restorative low colorectal anastomosis. The anastomotic leakage rate could have been much higher if roentgenographic contrast study was routinely done. However, if such a potential radiological leak did occur, it was not significant to be picked up clinically.

Two patients aged 75 and 50 years had functional obstructions, which were diagnosed at surgery. Tube decompression through the rectum and manipulation into the colon during laparotomy failed. Caecostomy, the usual next line of treatment, had to be done three days after the initial surgery, as the facility for colonoscopy was unavailable.[21, 22] The 75-year-old patient also had a cerebrovascular accident. The two above-mentioned patients, who had caecostomy, however, survived the procedure. The obstruction resolved and they were ultimately discharged.

The operative mortality will be considered generally low in our series. A majority of our patients were relatively young and healthy, and had benign diseases (sigmoid volvulus), with no intercurrent medical illnesses making them able to withstand the disorder and its surgical treatment. This observation has been made previously.[2,8,10,23,24] Improved patient health through preoperative correction of anaemia, fluid and electrolyte deficit, and acid-base disturbances were possible additional factors essential to patient survival.

The 42% mortality at last follow-up (10 months) in patients with malignant obstruction is a reflection of the general poor prognosis of this disease, as stated earlier and thought to be due to its aggressive nature in young patients and also late presentation. This pathetic situation can only be improved upon through well structured and executed health education and screening programmes.

This study has shown that native Africans living in their natural environment and maintaining their native dietary habits suffer from acute large bowel obstruction whose pattern is quite distinct from that found in Caucasians living in the western world. While the former suffer sigmoid volvulus, the latter suffer from obstructed colorectal cancer. In view of the relatively healthy and younger age group affected, scarcity and cost of colostomy appliances, the attitude of our society towards patients with a colostomy, and lack of appropriate toilet facilities in our environment, a one-stage procedure for obstructed left colon is an attractive and preferred option.

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