INTESTINAL OBSTRUCTION IN ADULT AFRICANS

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ABSTRACT

Intestinal obstruction is a common presentation for which safe and effective management depends on a rapid and accurate diagnosis. It is a surgical emergency and the understanding of its pathophysiology is central to appreciating the principles of its management. Conventional radiographs remain the first line of imaging but enteroclysis, CT, MRI and ultrasound are becoming increasingly used. Each imaging has its own limitations. When the obstruction is partial and of a benign aetiology, up to 85% may resolve with non-operative treatment while in other instances surgical operation remains the only option for resolution,[1]although poor outcomes are still reported from many centers in Nigeria.

INTRODUCTION

Intestinal obstruction is defined as a significant impairment of the normal movement of intestinal contents. It may account for a significant proportion of all emergencies in a surgical unit.

In Nigeria, there has been a significant change in the incidence as well as the spectrum of causes of intestinal obstruction in many tertiary centers over the past three decades with many possible reasons adduced for the observations. Way back in 1977, reports from Ibadan showed that intestinal obstruction was the commonest surgical emergency managed.[2] At that time, adult intestinal obstruction from intussusception was so common that "Ibadan intussusception" was popular in the literature but recent studies from Ibadan have shown that the overall incidence of intestinal obstruction as well as that of adult intussusception has reduced significantly.[3,4] Also across Africa, external hernias were commonly reported as the leading cause of intestinal obstruction in previous studies with obstructed inguinal hernia being the commonest finding. [5-11] However, over the past decade, many centers have found adhesions from previous operations as the new leading cause of obstruction.[12,13] In spite of these observed changes in the pattern of clinical presentation, mortality from intestinal obstruction across Africa still remains high and the condition is still a subject of interest among clinicians.

CLASSIFICATION OF INTESTINAL OBSTRUCTION

Intestinal Obstruction can be classified in different ways: [14-16]

1. The cause can be Congenital or Acquired
2. Timing of the obstruction can be Acute, Subacute or Chronic
3. Obstruction can be Partial or Complete
4. The site can be Small Bowel or Large bowel. High Intestinal obstruction refers to that occurring in the proximal small bowel, with attendant early vomiting, fluid and electrolyte challenges while Low Intestinal obstruction involves the distal small bowel and the large intestine.
5. According to the mechanism, obstruction can be Mechanical (Dynamic) or Adynamic (Ileus).
6. Pathophysiological classification includes Simple, Strangulation and Closed-Loop obstruction.
7. The anatomical site of the obstructing lesion can be Intraluminal, Intramural or Extramural.

AETIOLOGY OF INTESTINAL OBSTRUCTION

In African population, intestinal obstruction from worms, especially Ascaris lumbricoides is common in the rural agrarian population. In some instances, a heavy worm load may occur in children with obstruction and occasional perforation. [19] Volvulus, the twisting of an air-filled segment of bowel about its narrow mesentery, is rare in Africans compared to western populations and this has been attributed to anatomical and dietary differences in the populations.[20-22] Obstruction from intussusception, though commoner in children is found in adults in many instances and intestinal tumors may serve as the lead point.[3,4,23,]

PATHOPHYSIOLOGY OF INTESTINAL OBSTRUCTION [14-16]

obstruction refers to a mechanically obstructed bowel with intact blood supply. Cessation of movement of intestinal contents leads to accumulation of fluid and gas above the point of obstruction. Fluid accumulation is worsened by the progressive impairment of the normal fluxes of fluid from the lumen to the capillaries in the bowel wall with resultant movement of water, sodium

I) MECHANICAL OBSTRUCTION	
• Intraluminal Obstruction	
	Ascaris Worm
	Impacted faeces
	Intussusception
	Polyps
	Gallstones
	Others: impacted barium, meconium plug, bezoars, gossipiboma, ingested foreign bodies.
• Intramural	
	Neoplasms of small and large bowel
	Inflammatory conditions such as Intestinal tuberculosis, Schistosomiasis, diverticulitis, Ulcerative colitis, Chron's disease
	Some congenital conditions manifesting in adulthood such as Hirschsprung's disease.
	Radiation strictures
• Extramural	
	Adhesive bands
	Abdominal wall hernias
	Intra-abdominal malignancies
	Others: annular pancreas, aberrant vessels
• Volvulus	*may involve small or large intestine*
II) ADYNAMIC OBSTRUCTION	*causes include:*
	Electrolyte imbalance,
	Peritonitis,
	Retroperitoneal lesions
	Septicaemia
	Pseudo-obstructions
	Vascular Occlusions
	Systemic Poisoning

Table 1: Causes of Adult Intestinal Obstruction in Africa[14-18]

and chloride into the obstructed lumen (third space loss). Fluids are also lost into the bowel wall with increasing oedema. Accumulated gas comprising nitrogen (70%), oxygen (12%), CO_2 (8%), H_2S, ammonia and hydrogen contribute significantly to luminal distension. Without relief of the obstruction, the raised intraluminal pressure and consequently raised intramural pressure may compromise the venous drainage and arterial supply to the bowel with resultant ischaemia, necrosis and perforation. Stasis also leads to bacterial overgrowth with toxin production and bacterial transmigration across the compromised bowel wall.

obstruction, referring to occluded bowel with compromised blood supply occurs more commonly and more rapidly with extraluminal compressions. Infarctions and gangrene may occur very early. In Africa, strangulation from external hernias especially inguinal, femoral and umbilical hernias are commonly encountered. However, strangulation from adhesive bands from previous laparotomies is on the increase[12,13]. Strangulation may also occur with volvulus and intussusception.

obstruction is seen in occlusion of both afferent and efferent limbs of a loop of bowel. Rapid distension of the obstructed loop with progression to strangulation, gangrene and perforation occurs. There is also a rapid bacterial proliferation and endotoxin release within the closed loop.

In obstructing tumours of the left colon with a competent ileo-caecal valve, caecal perforation may occur due to the increased tension within the caecal wall with distension (Laplace's law). The risk of caecal perforation is high when caecal diameter exceeds 13cm.

: 3 types are described. *Inhibition or adynamic* ileus is that in which bowel neuromuscular activity is inhibited with impaired movement. In *spastic* ileus, the bowel is contracted without propulsive activity, while vascular occlusions lead to bowel hypoactivity termed *ischaemic* ileus.

CLINICAL FEATURES

The cardinal symptom of mechanical intestinal obstruction is colicky abdominal pain due to increased

peristalsis above the site of obstruction in an attempt to overcome it. Usually, the site of the pain may help in localizing the involved bowel. The pain usually becomes generalized when peritonitis from strangulation or perforation ensues. In such instances, fever, dehydration and tachycardia may be found. Vomiting occurs early in high obstruction as well as in paralytic ileus. Nausea, constipation or obstipation and abdominal distension may be present.

The abdomen may be distended with or without intestinal patterning and visible peristalsis. Tenderness with rebound is a sign of compromised bowel wall. The percussion note is tympanitic when gaseous distension is marked. A grossly distended, non-tender abdomen with leukocytosis characterizes mesenteric vascular occlusion. Bowel sounds may be hyperactive in early mechanical obstruction and hypoactive or absent in adynamic obstruction. Digital rectal examination will note the presence of rectal masses, Blummer's shelf and presence or absence of formed faeces.

In Africa, late presentation of patients with intestinal obstruction in hospital has been widely reported with majority of patients presenting 2-5 days after the onset of obstructive symptoms.[6,8,9,10,13] In some instances, the patients may present in hypovolaemic shock or with acute renal failure and severe gram negative septicaemia with attendant poor outcome.

INVESTIGATIONS[14,15,24]

Plain abdominal X-ray is usually helpful in diagnosis. Multiple (≥3) air fluid levels on the erect (or lateral decubitus) film, and bowel dilatation on the supine film showing haustral markings in colonic dilatation or valvulae conniventes in jejunal dilatation aids diagnosis. Abdominal ultrasound may help in showing presence of intrabdominal masses, ascites and liver secondaries in malignant obstruction. In such instances, CT scan and MRI may provide additional information. Newer modalities such as CT enteroclysis are also being tried.[25] Laboratory findings may include elevated serum urea, nitrogen and creatinine and with persistent vomiting, hypokalaemia, hyponatremia and acid-base disturbances. Moderate leukocytosis occurs in mechanical obstruction but very high WBC count (>40,000/mm3) may be seen in primary mesenteric vascular occlusion. Serum amylase levels may also be elevated in mechanical obstruction. Other investigations such as colonoscopy, barium enema, small bowel enema, diagnostic laparoscopy and tumour marker assay may be done as required. In many centers across Africa, these specialized investigative modalities may be unavailable or unaffordable to the majority of the patients. A good clinical acumen aided with basic investigations is hence relied upon for prompt diagnosis.

TREATMENT [14-18, 25-29]

In acute obstruction, immediate resuscitation and supportive care is essential. Nasogastric suction, intravenous fluids for intravascular volume repletion and passage of urethral catheter to monitor hourly urinary output should be done in the emergency unit. Apart from nasogastric suction, the use of long intestinal tubes such as Baker's tube has been advocated. Early correction of electrolyte derangement obtained from laboratory tests is also essential. Parenteral antibiotics covering for gram negative and anaerobic organisms must be commenced with resuscitation. Early laparotomy should be planned in patients with acute obstruction. However, with chronic obstructions, full investigation of the aetiological factor and an elective plan for definitive management may be appropriate.

In the now frequently encountered adhesive intestinal obstruction, conservative management with "suck and drip" and careful monitoring of the patients' response is usually effective. Only 10-15% of such patients may eventually require surgery on account of progression to strangulation or non-resolution on conservative treatment. On the other hand obstruction from external hernias always requires surgical intervention. Simple herniorrhaphy, herniolaparatomy or laparotomy may be done depending on the presence or absence of bowel strangulation and gangrene.[29]

In complete obstructions from mechanical causes, early laparotomy after adequate resuscitation is preferred. After dealing with the obstruction, procedures to prevent recurrence (such as herniorrhaphy, adhesiolysis, excision or fixation of a bowel prone to volvulus etc) must be carried out at surgery. Enterotomy for removal of intraluminal obstructing lesions (e.g. gallstones bezoan) may be done. In some instances resection of the obstructing lesion or strangulated bowel with primary anastomosis and or formation of a cutaneous stoma (ileostomy or colostomy) are preferred.

Malignant bowel obstruction may also necessitate surgery after stabilizing the patient. And palliative surgeries such as bypassing the obstruction, endoscopic stent placement or palliative resections can be attempted. Fecal impaction can be removed digitally followed by serial enema saponis. Rarely do fecal concretions require a laparotomy. Obstruction due to worms may respond to antihelminthic therapy

but will require surgery in rare cases of strangulation or perforation.

The prognosis of intestinal obstruction depends on the cause of obstruction, timing of presentation, presence of bowel strangulation, gangrene or perforation and associated co-morbidities. Sourkati et al[8] observed that the high mortality rate of intestinal obstruction found in Sudan may be related to delayed presentation, fluid and electrolyte imbalance as well as intestinal ischaemia at presentation.

CONCLUSION

The pattern of causes and clinical presentation of acute intestinal obstruction in Africa has changed over the years due to several factors. However, poor outcomes are still reported from many centers. Improved health education among the patients as well as a better understanding of the pathophysiology and management of the condition among health care providers may improve the outcome.

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