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Tropical surgical abdominal emergencies: acute intestinal obstruction

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Summary

In a prospective evaluation of acute intestinal obstruction in emergency surgery, 3550 consecutive patients were studied. In the vast majority of patients (75%), obstruction was due to the external hernia, the inguinal hernia being by far the commonest type. However, the ascaris worm in children, volvulus of the sigmoid colon in adults, and intussusception in both children and adults, were significant causes of the disorder, and together accounted for 18% of the patients. Obstruction by the ascaris worm is easy to diagnose (by stool microscopy), and effective treatment (with anti-helminthics) is readily available and cheap. A large number (90%) of the volvulus patients required resection for gangrene of the colon, thus arguing a strong case in support of laparotomy and inspection of the colon whenever feasible. A significant (41%) proportion of intussusception cases were adult, and in 33% of this group the lesion was associated with a tumour of the small bowel. The chief reason for death (10%) was late reporting to hospital.

Résumé

En étude prospective d'une vive obstruction intestinale, 3500 patients ont été vus dans 3 hôpitaux au sud-Est du Nigéria pendant une période de dix ans — de janvier 1973 à décembre 1982. La plupart des patients se sont présentés tard à l'hôpital dans un état de fluide marquée et d'un épuisement électrolyte et souvent avec une péritonite associée avec une cellulite propagée du scrotum et de l'intérieur du paroi abdominal. Dans la vaste majorité des

patients, 75% d'obstruction était à cause de la hernie extérieure. Dans ce groupe des malades, le type le plus commun de la hernie était la hernie inguinale 92%, suivie par la hernie fémorale 4%. Autres hernies extérieures — ombilicale, para-ombilicale, incisionale et obturateur ont rendu compte de 4% des patients. Les causes de l'obstruction dans 25% restant des patients étaient des vers ascarides 7%, volvulus du colon sigmoïde 6%, l'intussusception 5%, bandes et adhésions 4% et les anomalies congénitales 1.8%. Il y avait 533 résections donnant un taux de résection de 15%, 481 pour le gangrène du petit intestin à cause de la hernie inguinale étranglée et 47 pour le gangrène du grand intestin à cause du volvulus du colon sigmoïde. Des 3550 patients, 355 mouraient donnant un taux de mortalité de 10%. Cinq des patients mouraient de l'anesthésie vertébrale. Un facteur majeur des patients morts était la présentation retardée des patients. Le résultat montre que les hernies constituent des problèmes chirurgicaux majeurs en Afrique tropical exigeant une attention urgente en forme des services chirurgicaux améliorés dans cette région grossièrement en manque des médecins.

Introduction

The impression in tropical Africa is that emergency surgical operations form a substantial part of the total number of surgical operations conducted yearly in hospitals. Furthermore, emergency procedures are thought to be associated with high mortality and morbidity rates. Work in this department has attempted an evaluation of emergency surgery, and a previous communication has focussed on acute appendicitis [1]. The present report is of 3550 consecutive patients who were seen with acute

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intestinal obstruction during the period January 1973 to December 1982. Although there have been several previous studies of acute intestinal obstruction in Nigeria [2-6], none, to the knowledge of the author, has examined a large patient population, and this is probably the first major study of its kind from the Nigerian South Eastern equatorial rain forest region.

Patients and methods

The study is of 3550 consecutive patients managed by the author and others in three general hospitals serving the South Eastern equatorial rain forest region of Nigeria: St Luke's Hospital, Anua, Uyo (1973-1974), Iquta Hospital, Oron (1974) and St Margaret's Hospital, Calabar (1977-1982).

Management strategy

Pre-operative resuscitation was with available intravenous fluids and intestinal intubation using a nasogastric tube. When sepsis was evident or gangrene of the bowel suspected, available antibiotics were administered pre-operatively. These measures were continued for up to 12 h prior to surgery.

Haemoglobin estimation was carried out in all cases, and, when facilities were available, serum urea and electrolytes were determined. Urine volume was measured and hourly out-put recorded; urine was tested for sugar in all patients. In all children, stool was examined for intestinal helminths, especially ascaris, and blood tested for sickling. Radiographs of the chest and the abdomen in the erect and supine positions were made.

Anaesthesia

Local anaesthesia with 1 or 2% Xylocain, spinal anaesthesia using heavy 'nupercain' and Ketamine were available; they were employed singly or in combination.

Operation

The incision was determined largely by the suspected cause of the obstruction. Abdominal

distension was overcome by emptying the distended loops of bowel through existing perforation(s) or an appropriate incision placed in the antemesenteric border. Gangrenous small bowel was resected and an end-to-end anastomosis secured. In the presence of peritonitis, and cellulitis of the scrotum and/or anterior abdominal wall, the peritoneal cavity was drained with available red rubber corrugated or tube drain; the wound and scrotum were drained separately. The wound was always closed primarily. Further resuscitation and correction of fluid and electrolyte imbalance were continued in the post-operative period.

Results

Age and sex

Of the 3550 patients, 3043 were male and 507 female, giving a male : female ratio of 6 : 1. Their ages ranged from 1 day to 80 years. The majority (75%) of patients were between 20 and 54 years old: the 30-34 year age group accounted for the largest number (62%) of patients arranged according to age groups. In contrast, only 104 patients were children, and 63 (2%) were over 70 (Fig. 1).

Duration of symptoms

The vast majority (2485 or 70%) of patients presented at 5-7 days of colicky abdominal pains; 710 patients came to hospital at 2-4 days and only 355 (10%) sought hospital treatment within 24 h of illness.

Investigations

Barium enema (Fig. 2) was helpful in the diagnosis of volvulus of the sigmoid colon (Fig. 3); it showed enormous distension of the sigmoid colon and marked thickening of the bowel wall. Stool examination for ova of ascaris confirmed the diagnosis of obstruction by this parasite. Of 88 children stool-tested for ascaris ova, 66 were positive and obstruction was due to the worm in 62.

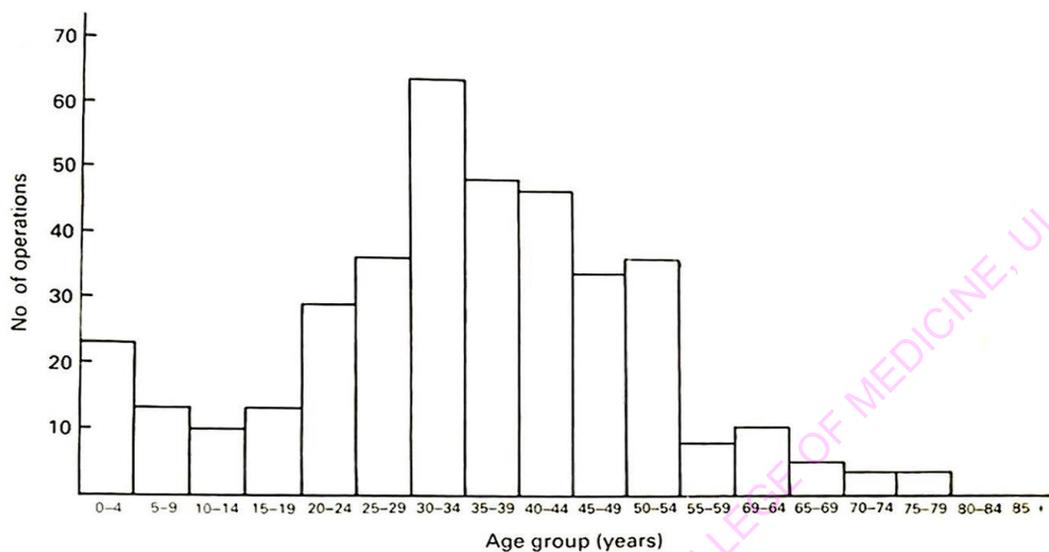


Fig. 1. Age distribution in acute intestinal obstruction in Calabar 1977-1981.



Fig. 2. Barium enema in an adult showing enormous distension of the sigmoid colon and thickening of the bowel wall.



Fig. 3. Shows gross distension of the sigmoid colon: the distended loop was filled with blood, and gangrene was evident.

Aetiology of obstruction

The causes of intestinal obstruction are summarized in Table 1, which clearly shows that in the majority of patients, 2663 out of 3550 (75%), obstruction was due to strangulated external hernia. The cause of obstruction was internal in 887 (25%) patients.

Among the external hernia group, the inguinal hernia was by far the commonest hernia, accounting for 2450 of 2663 (92%) patients, followed by femoral hernia 107 (4%), umbilical hernia 80 (3%), paraumbilical 20 (0.8%) and incisional and obturator herniae in three patients (0.1%) each (Table 1).

The commonest internal cause of intestinal obstruction was ascaris worms in 62 children (7%), followed by volvulus of the sigmoid colon 52 (6%), intussusception 44 (5%), bands and adhesions 35 (4%) and congenital anomalies 16 (1.8%). Obstruction by ascaris worms was associated with the passage of adult worms from one or more of the orifices in only six out of the 62 children. Sigmoid volvulus was associated with severe abdominal pains and gross distension; 48 of the 52 patients were male. Eighteen (41%) of the patients with intussusception were adults, and the remaining 26 were children. Of the 18 adult intussusception cases, six were associated with small bowel tumour — adenocarcinoma in four patients and lymphoma in two.

Mortality and morbidity

Of the 3550 patients, 3545 (99.9%) came to operation. Of this number 355 died, giving an overall mortality of 10%. There were 533

Table 1. Aetiology of acute intestinal obstruction in 3550 patients

Cause	No. of cases	%
External herniae	2661	75
Ascaris worms	249	7
Volvulus	213	6
Intussusception	178	5
Adhesions and bands	142	4
Congenital anomalies	64	1.8
Unidentified causes	43	1.2

resections, giving a resection rate of 15%, 481 for gangrenous small bowel and 47 for gangrenous large bowel. Wound infection complicated recovery in 248 patients (7%). Isolates included coliforms, *Staphylococcus aureus*, *Proteus* and *Pseudomonas*. Infection due to anaerobic bacteria could not be confirmed as there were no facilities for culturing anaerobic bacteria.

Discussion

The commonest tropical surgical emergency during the period of study was clearly acute intestinal obstruction; the second was trauma due to road traffic accidents and accidental fall from a height; and the third was acute appendicitis. The 3550 patients seen during the study are probably a fraction of the incidence of acute intestinal obstruction in the community.

The external hernia stands out distinctly as the commonest and most important single cause of intestinal obstruction, accounting for 75% of all patients. It is noteworthy that the inguinal hernia accounts for the largest number (92%) of these patients, followed by femoral hernia and umbilical hernia. The impression is that in the past two decades the number of patients with external hernia has shown no sign of diminishing. Previous accounts in various regions of tropical Africa [7-9] support this observation.

Acute intestinal obstruction was due in the remaining one-quarter of patients chiefly to ascaris worms, volvulus of the sigmoid colon and intussusception. Intestinal helminths, especially the ascaris worm, are of special interest to the surgeon in this region; first, because they are common [10-12] and can cause considerable morbidity and sometimes mortality, and, secondly, because obstruction in children when due to this worm is relatively easy to diagnose (by positive stool microscopy) and eminently easy to treat — with anti-helminthics which are readily available and affordable.

Volvulus of the sigmoid colon is commoner in this region than Europe. Of the 52 patients seen in this series, 47 (90%) required resection for gangrene; the remaining five were treated by reduction at laparotomy and deflation by a rectal tube. The choice of treatment for this lesion is influenced by many factors. The large number of patients with necrosis of the sigmoid colon seen in the present study made resection

obligatory and argues a strong case in support of laparotomy and inspection of the colon whenever feasible. It is debatable whether resection should be carried out in the absence of gangrene, especially as some essential antibiotics such as i.v. metronidazole are very expensive and in short supply, and fresh whole blood is not readily available. Majority opinion seems, however, to favour resection because of the reportedly high recurrence rate following simple reduction [13].

Intussusception caused obstruction in 18 adults and 26 children; in six adults intussusception was due to small bowel tumour — adenocarcinoma in four and lymphoma in two. The frequency of adult intussusception in this series is similar to those of previous studies especially in Western Nigeria [14–15], but stands in contrast with reports from non-African countries, including Trinidad [16] and Western Europe, where the disease is reportedly very rare. Furthermore, the low frequency with which adult intussusception was associated with tumour in the present study contrasts with the high rates observed outside tropical Africa — Trinidad 90% [16], United Kingdom 80% [17–18] and United States of America 83% [19–20].

Of the 355 patients who died, five deaths were due directly to spinal anaesthesia which caused instant shock. It became clear that this form of anaesthesia was unsuitable in the severely ill obstructed patient with gross fluid and electrolyte deficit; its use was discontinued and no more anaesthetic deaths occurred. The cause of death in the vast majority of patients was late presentation in hospital; treatment in these patients was very late and ineffective. A major improvement in the surgical services is urgently required in this region.

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