

Ischaemic Bowel Disease in Resected Intestinal Specimens

R. SARFRAZ S A KHAN N A CHAUDHRY

Department of Pathology, Postgraduate Medical Institute, Lahore.

Correspondence to: Dr. Rahat Sarfraz.

Forty four cases (22%) of ischaemic bowel disease were found in a total of 200 resected specimens studied at PGMI, Lahore. Mean age of these patients was 35.88 years, showing male preponderance. The commonest presenting complaint of these patients was pain. The mean duration of presenting complaints was 2.69 months. Small intestine was the commonest bowel segment resected. Mean length of resected specimens was 28.75cm. On gross examination of the specimens, surface blackening was the commonest finding. Haemorrhagic necrosis constituted the commonest microscopic pathology.

Key Words: Ischaemia, intestine

Intestinal ischaemia results from a variety of causes. Therefore a number of descriptive and pathogenetic terms have been used to describe different clinicopathological features of ischaemia of the intestine¹⁻⁶. To cover the whole spectrum of changes the concept of ischaemic bowel disease was proposed^{7,8} which refers to sequential series of changes that occur following anoxia to the wall of intestine⁹.

The present study was carried out to document the clinicomorphological features of intestinal ischaemia in resected intestinal specimens.

Material and Methods

A total of 200 resected specimens of intestine were received in Pathology Department Postgraduate Medical Institute, Lahore from February to December 1994. The specimens were fixed in 10% formol saline. Relevant clinical information was obtained from patients records. Detailed gross examination of each specimen was carried out. Representative tissue blocks were processed and stained with haematoxylin and eosin for histopathological examination.

Results

A total of 44 cases (22%) of ischaemic bowel disease were found. The mean age of these patients was 35.88±22.3 years (Range 2 days to 80 years). Twenty nine were males (65.91%) and 15 were females (34.09%).

The commonest symptom of these patients was pain (40 cases, 90.90%). Duration of presenting complaints ranged from 2 hours to 3 years with a mean duration of 2.69±8.39 months.

The common investigations performed in these patients in order of frequency were haemoglobin estimation (43 cases, 97.72%), X-ray abdomen (25 cases, 56.81%), X-ray chest (24 cases, 54.54%) and ESR (19 cases, 43.18%).

Exploratory laparotomy was the commonest surgical procedure performed (33 cases, 75%), followed by right hemicolectomy (6 cases, 13.63%), repair of inguinal hernia (4 cases, 9.09%) and jejunal resection (1 case, 2.27%).

Operative findings in cases of ischaemic bowel disease are given in Table 1. The common causes responsible for ischaemia were diverticula (5 cases, 11.36%), volvulus,

band around intestine, hernia and adhesion (4 case each, 9.09%) Out of 4 cases of volvulus 3 were involving sigmoid colon and 1 was involving small intestine. All 4 cases of strangulated hernia were inguinal. Polyp was the cause in one case of intussusception, whereas no cause was found in other 2 cases.

Table 1: Operative findings in cases of ischaemic bowel disease.

Operative findings	No. of cases	%age
Diverticula	5	11.36
Volvulus	4	9.09
Band	4	9.09
Hernia	4	9.09
Adhesion	4	9.09
Intussusception	3	6.83
Band & adhesion	3	6.83
Diverticulum & adhesion	1	2.27
Diverticulum & band	1	2.27
Trauma	1	2.27
Pancreatitis	1	2.27
Neonatal necrotising enterocolitis	1	2.27
No finding	12	27.27
total	44	100.00

Small bowel was involved in 28 cases (63.63%), large bowel in 4 cases (9.09%) and both small and large bowel in 12 cases (27.27%). The mean length of resected bowel segments was 28.75±21.80cm. Haemorrhagic necrosis constituted the commonest microscopic pathology (32 cases, 72.73%), followed by granulation tissue formation (9 cases, 20.45%) and stricture (3 cases, 6.82%) (Table 2).

Table 2: Morphological classification of ischaemic bowel disease

Ischaemic bowel disease	n=	%age
Haemorrhagic necrosis	32	72.73
Granulation tissue	9	20.45
Stricture	3	6.82
Total	44	100.00

In a total of 12 cases where no cause was detectable at laparotomy (Table 1), on microscopic examination only two cases revealed thrombi in mesenteric blood vessels.

Discussion

A variety of descriptive and pathogenetic terms like ischaemic colitis⁶, mesenteric venous thrombosis¹⁰, mesenteric arterial thrombosis¹¹, non-occlusive mesenteric infarction⁴ and haemorrhagic gastroenteropathy² have been

used to describe different clinicopathological manifestations of ischaemia of the intestine. Terms like uraemic colitis⁹ and radiation enterocolitis³ describing aetiological basis and neonatal necrotizing enterocolitis⁵ have also been included in this category. To cover the whole spectrum of changes as well as systemic disorders, the concept ischaemic bowel disease was proposed⁷. We in our present study used the term for cases revealing morphological changes of intestinal ischaemia, irrespective to the aetiology of the disease.

The disease can occur in any age group from infancy to old age^{5,12,13}. The age range in the present study also varied widely. It was from 2 days to 90 years.

There were 29 male and 15 female cases in the present study. Different studies give a variable sex distribution. Male predominance was found in cases of mesenteric venous thrombosis^{10,14} female predominance in cases of arterial thrombosis, embolism and non occlusive mesenteric infarction¹¹. In cases of ischaemic colitis, equal sex distribution¹² as well as female predominance has been reported. However no explanation has been given for this observed sex variation. Bradbury et al¹⁷ reviewing the mesenteric ischaemia did not discuss the sex distribution at all.

The main presenting complaint in the present study was abdominal pain as was found by other workers^{15,16,18,19}. Duration of presenting complaints in the present study ranged from 2 hours to 3 years. The duration of symptoms differs with the aetiology of the disease^{11,14}. It may be as short as 6 hours or patients may have symptoms for several days before frank infarction develops¹¹.

Table 1 gives different inciting and predisposing factors, responsible for ischaemic morphological changes. In eight cases more than one factor was responsible for ischaemic bowel disease. Ischaemia of the intestine is a very difficult clinical problem due to multiple causative factors^{19,20}. According to Lee and Toner⁸, in any given case ischaemic disease of the intestine may be of multifactorial causation. Misdiagnosis is frequent where condition is not suspected, when appropriate diagnostic tests are not performed or the disease is not recognised despite adequate diagnostic procedure¹⁵. In the present study in 12 cases no cause was detected clinically or at laparotomy. Preoperatively only reliable investigations in cases of suspected mesenteric ischaemia are arteriography and CT scanning^{14,17}. Both these investigations were not performed in our patients. Finding a vascular aetiology at times is very difficult. Ottinger and Austen¹¹, in their patients of mesenteric infarction found 50% patients without macroscopic occlusion of arterial or venous system. Clark et al¹² in their young patients with ischaemic colitis, found no real evidence of vascular aetiology. In various studies, non occlusive vascular disease accounts for 20-30% cases of mesenteric infarction^{17,12}. However, prognosis of the patient with mesenteric ischaemia depends on the presence and extent of infarction regardless of aetiology¹⁷.

In the present study small bowel was involved in 28 cases, both small and large bowel in 12 cases and large bowel alone in 4 cases. The distribution of the lesions along the intestine varies widely with the vessel involved^{2,11}. Segmental involvement is the hallmark of mesenteric venous thrombosis²², in contrast to arterial occlusion in which larger intestinal segment or even the entire small intestine with part of colon are gangrenous¹⁰. Simultaneous involvement of both small and large bowel is due to their shared blood supply⁷.

Gross changes seen in the present study were surface blackening, ulceration, dilatation, perforation and stricture (Fig.3). Appearance seen in the surgical specimen or at autopsy depends on the stage at which operation is performed as well as severity and duration of ischaemia²³.

The histopathological picture in cases of ischaemic bowel disease is also influenced by the size of area of involvement, reestablishment of blood flow and duration of ischaemic episode⁹. Transmural necrosis occurs in 6 hours, while recurrent mild localised ischaemia results in stricture formation¹⁷. We, in the present study histologically classified our lesions of ischaemic bowel disease according to scheme given by Morson et al²³ (Table 2). The scheme applies both to small and large bowel. They categorised their cases according to the duration and severity of damage into three groups. Acute, with haemorrhage and necrosis, reparative with granulation tissue formation and fibrosis, and ischaemic stricture.

In conclusion, intestinal ischaemia is one of the common causes of intestinal resection in our country and this study has highlighted the important clinicomorphological features of intestinal ischaemia.

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