

Primary Volvulus of Small Intestine

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Primary volvulus of the small intestine is rare in Great Britain. Bailey (1938), Woods (1945), Webber (1945), Tagart (1950), and Walker (1960) all reported single cases. The present case is reported both because of its rarity in Great Britain and because it presents unusual features.

CASE REPORT

At 8 a.m. on 12 October 1964 a housewife, aged 56, suddenly developed severe lower abdominal pain and backache. At 8.15 a.m. she vomited normal stomach contents. There was a past history of a similar but milder attack in June 1964, which passed off after she had gone to bed. No unusual dietary history was elicited.

On admission to the Nottingham General Hospital she was pale, slightly cyanosed, and in a state of shock. Her pulse was regular at 80 per minute. The systolic blood-pressure was 70 mm. Hg, while the diastolic was unrecordable. There was minimal generalized abdominal tenderness, the abdomen being soft and not obviously distended. Bowel sounds were normal. The femoral pulses were present and equal. There were normal faeces in the rectum. Radiographic examination of the chest and abdomen showed no abnormality. An electrocardiogram was normal. The haemoglobin was 15.7 g./100 ml. After admission 21 oz. (596 ml.) of fresh blood was vomited or aspirated from the stomach. At this stage it was thought that haemorrhage alone could not account for the clinical state of the patient. A diagnosis of mesenteric thrombosis was made.

At 4 p.m. resuscitation with blood and reconstituted plasma was started. After 4 pints (2.3 litres) had been given there was no change in the patient's general condition, but her abdomen had become distended, rigid, and silent. Intravenous courses of hydrocortisone and tetracycline were started. Intensive replacement of the circulating blood volume was continued till by 10 p.m., after 9 pints (5.1 litres) of blood and plasma had been given, the systolic blood-pressure reached 95 mm. Hg.

At 10.30 p.m. the patient was taken to the theatre. Free blood-stained fluid was present in the peritoneal cavity and a fetid smell was noted. The small intestine and mesentery were black and gangrenous, having undergone a volvulus clockwise of 360°. No adhesions or other pathology were found, and the bowel was not loaded with food. The upper 18 in. (45.7 cm.) of jejunum and lower 3 in. (7.6 cm.) of ileum were pink and viable. A further 3 ft. (0.9 m.) of upper jejunum was of doubtful viability, being very congested and a dusky plum colour. The rest of the small intestine was not viable and was resected, leaving 4½ ft. (1.4 m.) of upper jejunum and 3 in. (7.6 cm.) of terminal ileum. The jejunum was anastomosed side to side to the terminal ileum, and the abdomen closed with drainage.

The post-operative systolic blood-pressure was initially 130 mm. Hg and the diastolic 90 mm. Hg. In the following 36 hours 4 pints (2.3 litres) of plasma and blood were required to maintain it. In the following days the abdomen remained soft and bowel sounds returned, but gastric suction produced up to 1 litre of blood-stained fluid daily.

Immediately after the operation oliguria developed, urinary output being 200–300 ml./day. Intravenous fluids were restricted to 500 ml. of dextrose plus replacement for gastric suction and urinary output. By 16 October the patient had become comatose and jaundiced with a blood urea of 480 mg./100 ml. and a serum potassium of 6.2 mEq/l. She was transferred to the artificial kidney unit at the Royal Hospital in Sheffield with renal failure and suspected liver failure. There she was found to have a *Bacillus proteus* septicaemia. She was treated with the appropriate antibiotics and supportive therapy. Four haemodialyses accompanied by blood transfusions were carried out which kept her blood urea below 300 mg./100 ml. Her bowels started to move loosely on 18 October, though gastric aspiration continued to yield up to 1 litre per day

until 23 October, when aspiration was discontinued. She regained consciousness on 24 October. Unfortunately no diuresis occurred. Late on the 24th she suddenly became ill from pneumonia, and died early on 25 October.

Examination of the 11 ft. 8 in. (3.5 m.) of resected bowel showed the lumen to be filled with blood. The histology of the bowel wall showed intense congestion and haemorrhage due to infarction. The mucosa was partly necrotic but the muscle fibres were well preserved. Apart from venous congestion the vessels appeared normal.

Necropsy showed that the remaining 4 ft. (1.2 m.) of small intestine was intact, but the bowel wall at the distal end was paper thin, being held together by fibrous material from local peritonitis. The kidneys showed evidence of acute tubular necrosis. The liver appeared soft and yellow, with vacuoles present in the liver cells. Only minimal atheromatous changes were present in the abdominal aorta. There was bilateral basal pneumonia.

COMMENT

In primary volvulus of the small intestine no predisposing pathology is present. It is common in India and East Africa where vegetarians eat coarse indigestible food (McWatters, 1945; Kerr and Kirkaldy-Willis, 1946). Rose (1955) thought that distension of the small intestine associated with increased bowel motility predisposed to volvulus. Kerr and Kirkaldy-Willis (1946) suggested that the amount eaten and speed of eating were important. Presumably hyperactive distended loops of bowel undergo a twist, the weight of the loaded bowel prevents spontaneous reduction, congestion follows, and a volvulus is produced. In this case none of the suggested predisposing conditions was apparent and the aetiology remains obscure.

Though operation was performed within 15 hours of the onset of symptoms, earlier recognition of the depleted circulatory volume and more vigorous replacement, regulated by the patient's response, might have prevented permanent ischaemic changes in kidneys and bowel. The haematemesis was unusual, only one previous case being reported (Webber, 1945). This case also involved all of the small intestine and was fatal within 24 hours. Haematemesis would seem to indicate that the volvulus is of a rapid and tightly twisting type necessitating urgent operative reduction.

Of the remaining jejunum the distal 3 ft. (0.9 m.) was of doubtful viability. The minimal length of small intestine required to support life has not yet been established. Booth (1961), discussing the metabolic effects of intestinal resection, suggests that 14 to 18 in. (35.5 to 45.7 cm.) of jejunum is a reasonable minimum, though life is possible with less than this (Anderson, 1965). In this case excision of the jejunum, whose viability was doubtful, might have been wiser.

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