Presumably because they have been considered to be non-pathogenic, there has been little attempt to culture and further classify these organisms. However, the morphological descriptions of the commonest organisms, the so-called *Spirochaeta eurygyrata* (Hogue, 1922), closely resemble the spirochaete found in this group of patients. Because these organisms stain with haematoxylin, we think that they would be best classified as *Borrelia*. In future publications further details will be presented.

It is not possible at the present time to decide the significance of our findings. All the patients had rectal biopsies performed because of symptoms of one sort or another referable to the bowel. Some were found to be suffering from carcinoma of the colon. On the other hand, others had dysenteric symptoms of unknown cause, and these might possibly be cases of "spirochaetal dysentery." Antibiotic treatment of some of these cases may provide an answer to this problem, since we have reason to believe that the spirochaetes disappeared in one case after preoperative antibiotic therapy. There is also the possibility that this form of spirochaetosis gives rise to vague abdominal symptoms simulating appendicitis. It remains quite possible, however, that this attachment of spirochaetes to the surface of the colonic mucous membrane has no clinical significance.

SUMMARY

Ten cases of a new and apparently common form of intestinal spirochaetosis are described. The condition was first recognized by electron microscopy, but diagnosis can be made on routine histological preparations. Short spirochaetes, tentatively classified as *Borrelia eurygyrata*, are attached to and penetrate short distances into the surface epithelial cells. They are characteristically orientated in the long axis of the cells. At present it is not possible to decide the significance of our findings.

We acknowledge the invaluable technical assistance of Mr. D. McSeveney, whose skill made this study possible; we thank Mr. D. H. Clark, who referred the first patient to us; and we acknowledge the financial assistance from the M.R.C., who provided the electron microscope.

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Medical Memoranda

Volvulus of the Small Intestine after
Herniorrhaphy

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Primary volvulus of the small intestine is rare in Great Britain and its cause is usually obscure. Renton (1965) found five reported examples and added one of his own. Secondary volvulus is relatively common and its cause is better understood. The present case is reported in the hope that it may contribute to further understanding of the factors precipitating intestinal volvulus.

CASE REPORT

At 2 p.m. on 15 March 1966 a 68-year-old farmer developed lower abdominal pain after lifting a heavy weight while working in his fields. At the same time he noticed a tender swelling in his right groin. He was admitted to hospital at 6 p.m. For two years he had been aware of a small hernia in the right groin which previously had always been easily reduced. During the last seven years he had experienced attacks of abdominal distension, associated with flatulent discomfort, which lasted up to 10 days and resolved with the passage of watery diarrhoea. These attacks occurred two or three times a year and appeared to be unconnected with any disturbance in his hernia. He was not a vegetarian and ate a regular balanced diet.

On admission his general condition appeared satisfactory. His pulse was 72. The blood pressure was 160/80 mm. Hg. His chest showed signs of chronic bronchitis. A tender irreducible right inguinal hernia was present. The abdomen was not distended but bowel sounds were increased.

That evening the inguinal hernia was explored (N.H.V.) under general anaesthesia. It was found to be direct in type and to contain 6 in. (15 cm.) of gangrenous ileum, which was resected. End-to-end anastomosis was carried out and the hernia was repaired. Over the next few days his abdomen became painlessly distended and he was thought to have developed a paralytic ileus. On 19

March his bowels moved loosely and thereafter he had two or three loose motions daily, but the abdominal distension remained. He vomited 200 ml. of stomach contents on 22 March. When this was repeated on the 23rd an intravenous infusion of dextrose saline was started. On the 24th his abdomen suddenly became further distended, having increased 2 in. (5 cm.) in girth overnight. There was generalized abdominal tenderness and guarding. His pulse was 100. The blood pressure was 135/80. X-ray examination of the abdomen showed small-bowel distension, with fluid levels suggestive of obstruction in the distal ileum.

After the passage of an oesophageal tube and aspiration of the stomach, laparotomy was performed (C.J.C.R.). Blood-stained fluid was present in the peritoneal cavity. The small intestine was very distended, was dark purple in colour, and its viability appeared doubtful. The entire small intestine, except for the proximal 4 ft. (1.2 m.) of jejunum, had undergone a clockwise rotation of 720 degrees. There were no adhesions, and the previous anastomosis was patent and lying free in the right iliac fossa. No congenital or acquired abnormality was found to account for the volvulus. On reducing the volvulus the circulation to the intestine recovered. Because of the gross distension the bowel was deflated by a suction tube introduced through an enterotomy. The bowel was closed and the original anastomosis, which had leaked after handling, was oversewn. Later the same evening sputum retention and bronchospasm produced increasing dyspnoea, cyanosis, and carbon dioxide retention, leading to respiratory failure. Tracheostomy was performed (N.H.V.), allowing regular bronchial toilet. With physiotherapy, antispasmodics, and antibiotics respiratory function was improved. Gastric suction and intravenous infusions were continued until 28 March, when the abdominal distension started to resolve. His bowels thereafter moved once a day. Two episodes of vomiting on 2 and 6 April necessitated further gastric suction. By 8 April the vomiting and the abdominal distension had completely settled. The tracheostomy tube was removed and convalescence continued uneventfully.

COMMENT

In primary volvulus of the small intestine there is no obvious predisposing cause. It is commoner in Africa and India, where it is associated with a vegetarian diet of bulky indigestible

food (Kerr and Kirkaldy-Willis, 1946; McWatters, 1945). Rose (1955), discussing the aetiology, mentioned hypermotility and bowel distension as exciting causes. In secondary volvulus there is usually an abnormal congenital or acquired fixation of the intestine.

In this case the past history is consistent with attacks of subacute volvulus recurring over seven years. Though no anatomical abnormality was obvious in the mesentery, a volvulus through 720 degrees suggests undue mobility and length of mesentery. This could have been the result of previous subacute attacks of volvulus or it could have predisposed to them. Bulky diets are said to cause an increase in length of bowel and mesentery as well as hypermotility (Dickson, 1950). There was no evidence of unusual dietary habits in this patient. The right inguinal hernia might have anchored a loop of small intestine and produced a secondary volvulus. However, this hernia was said to be easily reducible up to the final attack of strangulation and to have been present for only two years. If it was responsible its repair should have cured the tendency for the bowel to undergo volvulus.

The final attack of volvulus appeared to start only after the inguinal hernia had been repaired and the bowel resected. It is possible, though unlikely, that the anastomosis acted like the occasionally reported antimesenteric tumour by partly anchoring the bowel and predisposing to volvulus (Aird, 1957). Lulenski (1961) reported cases where volvulus was superimposed on small-bowel obstruction. In this case the anastomosis appeared widely patent without any evidence that it could have caused mechanical obstruction. After any abdominal operation, especially with intestinal resection, there occur transient ileus, gaseous and fluid distension of bowel, and later

hypermotility. Sparkman (1952) and Cave (1953) reported cases of volvulus in the immediate postoperative period in which they thought that distension and hypermotility of the bowel were the exciting causes. It seems probable that this patient was subject to recurrent attacks of subacute primary volvulus and that the inguinal hernia was incidental. After the herniorrhaphy postoperative bowel distension and hypermotility were exciting causes in precipitating the final volvulus.

This case strengthens the view that postoperative distension can be an exciting factor precipitating volvulus, though a further predisposing cause is usually required. It emphasizes the necessity for observing carefully the progress of postoperative complications for any sudden deterioration that might call for urgent surgical treatment.

We are grateful to Mr. T. B. Field, who was in charge of this patient, for permission to publish this case.

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Relation of Pregnancy Toxaemia to Trophoblastic Tumours

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While the cause of pregnancy toxaemia remains obscure, the study of case histories of women with benign trophoblastic tumours (hydatidiform mole) serves to throw some light on this difficult subject.

The diagnosis of hydatidiform mole depends on four criteria: (1) a discrepancy between the expected and the actual size of the uterus, (2) the presence of pre-eclampsia before the 28th week of pregnancy, (3) a high urinary gonadotrophin excretion after the 16th week of pregnancy, and (4) the absence of foetal parts on radiology after the 16th week of pregnancy.

During 1958-64 250 cases of benign trophoblastic tumour were admitted to the General Hospital, Kuala Lumpur, and 66 (26.4%) of these had pre-eclampsia as defined by Dieckmann (1952), the disease being mild in 36 and severe in 30.

Size of the Uterus Related to Proportionate Incidence of Pre-eclampsia in Cases of Benign Trophoblastic Tumour

Size of Uterus	Total Cases	Pre-eclampsia	
		No.	%
Less than 12 weeks' pregnancy	8	0	0
12-15 "	17	1	6.0
16-19 "	75	10	13.3
20-23 "	78	22	28.2
24-27 "	55	22	40.0
28 or more "	17	11	64.7
	250	66	26.4

When the size of the uterus was related to the incidence of pre-eclampsia, it was noted that the greater the uterine size the more frequent was the associated finding of pre-eclampsia (see Table). But no correlation between the size of the uterus and the severity of toxaemia was noted.

COMMENT

That a higher proportionate incidence of pre-eclampsia was found in cases where the trophoblast was more active implies that abnormal trophoblastic activity rather than mechanical distension of the uterus is a precipitating cause of pre-eclampsia.

This opinion was further supported by the history of one of the patients who was admitted at 14 weeks' gestation with severe pre-eclampsia. She was Chinese, aged 24, gravida 2. Examination showed the uterus to be enlarged to the size of a 16-week gestation. A week after admission the uterus had enlarged to the size of a 20-week gestation, and the pre-eclampsia continued. Eight days after admission the signs of pre-eclampsia suddenly disappeared and no further uterine growth was noted. Intrauterine death was suspected, and as the uterus failed to expel the foetus spontaneously labour was induced with an oxytocin infusion on the 20th day after admission and a hydatidiform mole surrounded by fibrin and decidua was expelled.

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