PRIMARY TORSION OF THE GREATER OMENTUM IN CHILDHOOD

BY

P. FARRUGIA-BONNICI, M.D.

AND

H. B. MARSDEN, M.B., D.C.H., D.Path.

The Royal Manchester Children's Hospital

Since the first report of primary torsion of the greater omentum by Eitel in 1899, fewer than 100 cases have been recorded in the literature. The greatest incidence of this condition has been mainly in young adults and persons of early middle age, whilst its occurrence in childhood has been regarded as particularly rare, as evidenced by its omission from the majority of standard paediatric textbooks.

During a period of three months three cases of primary torsion of the greater omentum have been seen at the Royal Manchester Children's Hospital, the age of the patients being 6, 8, and 11 years.

Our experience suggests that this condition is not as rare in childhood as is generally believed, and we are therefore presenting this report so that omental torsion may receive greater consideration in cases of suspected appendicitis in childhood when the vermiform appendix is found to be apparently normal at operation.

Case 1

A 6-year-old girl with no previous relevant history was admitted to hospital on March 1, 1956, with a one-day history of generalized abdominal pain of sudden onset commencing immediately after eating a slice of bread-and-butter. The pain was accompanied by repeated vomiting and retching. It was colicky at first, becoming continuous later. The bowels were regular and were opened on the day of admission.

The patient was of normal development and not obese. She had a loose unproductive cough. The tongue was furred and moist. Her temperature was 98° F. (36.7° C.), pulse 120, and respiratory rate 24. Auscultation of the chest showed the presence of a few scattered inspiratory rhonchi and moist rales in the left lung, and the x-ray picture suggested the presence of simple bronchitis.

Examination of the abdomen revealed rigidity all along the right flank, with maximal and rebound tenderness in the right iliac fossa. There was also vague tenderness over the remainder of the abdomen, and Rovsing's sign was positive. The bowel sounds were normal, and examination of the hernial orifices and rectum yielded no additional information.

Other findings included a total white-cell count of 12,000 per c.mm., and urine examination was entirely negative. A diagnosis of acute appendicitis was made and the patient underwent operation on the day of admission.

Through a gridiron incision the appendix was inspected, and, although apparently normal, it was removed. There was no free fluid or blood in the abdominal cavity, but some of the mesenteric glands were rather large although otherwise normal. Digital exploration of the abdominal cavity revealed a small firm mass in the right hypochondrium, which, on enlargement of the original incision, was found to be a torsion of a segment of the greater omentum with the pedicle attached to the anterior superior border of the transverse colon just distal to the hepatic flexure. It had a mottled purple colour, a smooth convex anterior surface, and a nodular concave posterior surface, with sharp firm edges. The mass measured 9 cm. in greatest diameter and

was 7 cm. in length, tapering to a point at the tip. The pedicle had three clockwise twists and was about 3.5 cm. long. The rest of the omentum appeared healthy and not unduly loaded with fat. The twisted portion of omentum together with a piece of healthy omentum was excised above the pedicle. Histological examination showed distension of veins with numerous red corpuscles between the fat-cells.

A rather extensive subserosal haemorrhage in the transverse colon, medial to the attachment of the twisted pedicle, was noted.

The child made an uneventful post-operative recovery and was discharged home on March 11. When seen on April 5 she was reported to be quite well.

Case 2

A boy aged 11 years with no recent relevant history was admitted to hospital on March 12, 1956. For three days before admission he had complained of intermittent pain in the right lower abdominal quadrant. The pain was occasionally so severe as to make him cry out, and was associated with nausea but no vomiting. The bowels had previously been regular, but were not opened on the day of admission.

On examination the child was obese and complained of mild continuous pain in the right lower abdomen. His temperature was 98° F. (36.7° C.), pulse 80, and respirations 24. The tongue was clean and the breath not offensive. The abdomen was difficult to palpate owing to the obesity, and no definite mass could be felt. The hernial orifices were clear and the testes were present in the scrotum. There was marked generalized guarding, with tenderness and rebound in the right and left iliac fossae. Bowel sounds were normal. Rectal examination revealed nothing of note.

A straight abdominal x-ray film yielded no additional information. A white-cell count showed a total of 14,400 cells per c.mm., with 76% polymorphs. Examination of the urine disclosed nothing abnormal.

A diagnosis of acute appendicitis was made and the child underwent operation on the day of admission.

Through a gridiron approach the peritoneum was opened. No free fluid or blood was present. The appendix contained a solitary soft small faecalith but no signs of inflammation, and was removed. Digital exploration of the abdominal cavity revealed a small mass lying in the right hypochondrium. The wound was enlarged, and the mass was seen to be a torsion of a segment of the greater omentum. No enlarged mesenteric glands were seen and all the viscera were apparently normal.

The omental torsion arose from a pedicle attached to the anterior superior surface of the transverse colon just distal to the hepatic flexure. It had a mottled purple appearance, a smooth convex surface anteriorly, and a nodular concave surface posteriorly, the edges being sharp and firm. The greatest diameter was 5.5 cm. and the length 9 cm., tapering to a point at the tip. The pedicle contained four twists in a clockwise direction and was about 1.5 cm. long. The mass was excised together with a piece of normal omentum. There appeared to be a slight excess of fat in the neighbouring unaffected omentum.

Post-operative recovery was rapid and uneventful. The patient was discharged home on March 24 and was reviewed on April 14, when his condition was entirely satisfactory.

Case 3

An 8-year-old girl was admitted to hospital on June 8, 1956, with abdominal pain of two days' duration. The pain, appearing two hours after a normal meal, was gradual in onset and was first felt in the right lower quadrant. It was aggravated by walking and by rising up from a supine to a sitting position, and the severity was such as to disturb her sleep. There was nausea, but no vomiting. The bowels were regular and had been opened on the day of admission. There was no previous relevant history.

On examination she was found to be a well-nourished child, intelligent and co-operative, and did not appear to be in obvious pain. The face was flushed. Her temperature was 100° F. (37.8° C.), pulse 120, and respirations 24. The tongue was clean and moist and the breath not offensive. Examination of the abdomen revealed marked tenderness and guarding in the right iliac fossa with some rebound tenderness in this area. No masses were detected and the hernial orifices were clear. The white blood cell count was 15,400 cells per c.mm., with 71% polymorphs. Examination of the urine was negative. A diagnosis of subacute appendicitis was made.

At operation the following day, through a gridiron incision, the appendix was found to be normal and was removed. No free fluid or blood was seen in the abdominal cavity. There was some enlargement of the mesenteric glands.

Digital exploration of the abdominal cavity revealed a small mass just above the umbilicus. Enlargement of the wound revealed a haemorrhagic segment of omentum which had undergone torsion and become adherent to neighbouring healthy omentum. It arose by a pedicle from the anterior superior border of the transverse colon just distal to the hepatic flexure. It had a polygonal shape and measured about 4 cm. in length by 3.5 cm. in width. The margins were sharp and firm. The pedicle was about 1.5 cm. long and had three twists round a large central vein. The twisted omentum was excised together with a piece of healthy tissue, including the adherent portion.

The child made an uneventful recovery and was discharged home on June 26. When seen one month later she was symptom-free.

Discussion

The aetiology of primary torsion of the great omentum is not clear. Donhauser and Locke (1954) have listed the most generally accepted theories, which include predisposing and exciting factors. Predisposing factors are the presence of a large omentum, a long pedicle with narrow attachments, and excessive deposition of fat in the distal portion of the omentum. In our patients there was torsion of a part of the omentum which was distinct from the main mass. The pedicle in each instance was very narrow—possibly rather long in two cases—and a relatively large distal adipose mass was present.

The exciting agents include the application of external force in addition to violent exercise, tossing of the omentum due to peristaltic waves, and the haemodynamic theory. The latter suggests, briefly, that with venous obstruction the arteries become tense and the longer and more tortuous veins rotate round these more rigid structures.

We could not obtain any history of trauma or violent exercise in our cases, and the only noteworthy feature concerning the blood supply was the presence of a large central vein in the pedicle of Case 3. However, we felt that in this case the vein behaved as an axial band around which torsion was more likely to occur.

Peristalsis was thought to be the most important single exciting factor in the production of the torsion in our cases. In Case 1 the pain began immediately after the consumption of food. The situation of the torsion—namely, in the right hypochondrium—and the direction of rotation were similar in each of our cases and involved the right free border of the omentum. In this connexion it is noteworthy that the great majority of reported cases have been in the right upper quadrant. This suggests that antagonistic peristaltic forces may have played a part in our cases owing to the attachment of the omentum to the stomach and transverse colon.

As regards the clinical features of this condition the patients are generally described as being robust or obese (Altemeier and Holzer, 1946). Two of our patients were of average build and development, and only Case 2 showed definite evidence of obesity. The marked preponderance of male cases as found by Smythe (1906) in the adult patients

was not a feature of our material, although this is of little significance in so small a series.

In practically all the reported cases and in each of our own patients a pre-operative diagnosis of appendicitis was made. The differential diagnostic features for distinguishing these conditions have been listed by Smythe. A relatively mild systemic disturbance with low-grade pyrexia and little leucocytosis is regarded as the usual finding in torsion of the omentum, and in only Case 3 of our series was there slight elevation of temperature. In the six cases reported by Altemeier and Holzer there was nausea but no vomiting, although in our first case repeated vomiting was associated with retching. Only in this instance did we find a furred tongue, and in none of the cases was the breath offensive.

Primary right-sided localization of the pain in omental torsion is also suggested by Smythe as one of the distinguishing features, but, again, in Case 1 there was generalized distribution of the pain at the onset. Finally, the greater degree of abdominal rigidity and the severity of the pain are thought to be points in favour of appendicitis. In our patients, however, there was considerable rigidity, and in Case 2 the pain was exceptionally severe.

In conclusion we feel that it is not always possible to make a correct pre-operative diagnosis in cases of omental torsion. In addition, it is important not to mistake the sharp, firm edge of the twisted segment for the liver edge on digital exploration at operation. In two of the cases the mesenteric glands were thought to be appreciably enlarged, and in the presence of an apparently normal appendix the clinical picture might have been attributed to mesenteric adenitis. Our findings support the opinion of Cavanagh and Campanale (1955) that careful examination of the omentum should be part of the abdominal exploration whenever the suspected pathological lesion is not confirmed at laparotomy. This is particularly true when a gridiron incision is made following a diagnosis of appendicitis which is not supported at operation.

Summary

Three cases of primary torsion of the great omentum in childhood are described, and it is felt that this condition is not as rare as would appear from a study of the literature.

The aetiology is discussed and the differential diagnosis from acute appendicitis considered.

Examination of the omentum should be carried out in all cases of suspected appendicitis in children when the appendix is found to be normal at operation, especially when making use of a gridiron incision.

We thank Mr H. A. Haxton and Mr. A. Jolleys for permission to use the clinical records.

REFERENCES

- Altemeier, W. A., and Holzer, C. E. (1946). *Surgery*, 20, 810.
Cavanagh, M. J., and Campanale, R. P. (1955). *A.M.A. Arch. Surg.*, 70, 564.
Donhauser, J. L., and Locke, D. (1954). *Ibid.*, 69, 657.
Eitel, G. G. (1899). *Med. Rec. (N.Y.)*, 55, 715.
Smythe, F. D. (1906). *Surg. Gynec. Obstet.*, 3, 531.

The British Standards Institution has issued a memorandum on therapeutic x-ray equipment. Recommendations are made to ensure safety and efficiency in the use of the machinery; the amounts of permissible extraneous radiation are stated. The memorandum suggests that the essential dimensions of x-ray equipment should be uniform to allow for interchangeability between parts produced by various manufacturers. Recommendations on the electrical parts of the equipment are also included. Radiologists and manufacturers have collaborated with the Ministry of Health in the preparation of the memorandum (B.S.2849). It is obtainable from the British Standards Institution, Sales Branch, 2, Park Street, London, W.1 (price 4s. net).