LIMITATIONS

Colonoscopy subjects the patient to inconvenience and some discomfort. It is time-consuming for the operators and occupies x-ray facilities for long periods, though we estimate that even in the most difficult cases we have used under 45 seconds of screening time. The instrument is costly, requires careful maintenance, and is subject to wear and tear which may lead to damage of the fibre bundle or of the mechanical parts. For these reasons it seems likely that colonoscopy will be a specialist service provided in a few centres. Examination of the whole colon is not to be recommended as an occasional procedure for those with a limited interest in endoscopy.

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Haematoma of Rectus Abdominis Associated with Dialysis

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Haematoma of the rectus abdominis muscle has been mistaken for a variety of abdominal lesions and only about one in five cases is correctly diagnosed. They usually occur at the site of anastomosis of the superior and inferior epigastric arteries. The main symptom is severe abdominal pain of sudden or gradual onset. Nausea, vomiting, fever, and prostration may be present, and a tender, fixed mass can usually be felt in the abdominal wall, which is guarded or rigid. Discolouration of the skin over the lesion is a rare and late sign.

Factors commonly causing or predisposing to haematoma of the rectus abdominis muscle are listed in the Appendix. We report here four cases in which the condition was seen in patients undergoing either peritoneal dialysis or haemodialysis, and we believe this is the first time such an association has been recorded.

Case 1

The patient was a 45-year-old woman who had been undergoing haemodialysis for 15 months. She had persisting ascites due to constrictive uraemic pericarditis which had developed before she started dialysis. Owing to a septicaemia from infection of her shunt with *Pseudomonas aeruginosa* a Cimmino-Brescia arteriovenous fistula had been made one month previously.

Before cannulating the fistula preparatory to haemodialysis the patient's blood pressure, pulse, respiration, and temperature were found to be normal. The abdomen was moderately distended owing to ascites, and the spleen was palpable two finger-breadths below the left costal margin. Haemodialysis was started with R.S.P. Travenol equipment. Heparin 5,000 U was given as a priming dose followed by 600 U hourly. After five hours she complained of sudden, left-sided abdominal pain, especially under the costal margin. On examination the abdominal wall felt turgid and there was tenderness and guarding. A mass occupied the left upper quadrant, and splenic thrombosis was suspected. Dialysis was discontinued and protamine given to counteract the effect of heparin.

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At laparotomy several litres of ascitic fluid was drained and a large haematoma was found extending through all the muscles of the left side of the abdomen. The enlarged spleen contained a number of necrotic areas and splenectomy was performed. The liver was normal. Postoperatively she did well.

Comment.—The cause of the haematoma in this patient was the anticoagulant therapy, the aetiological factor most often reported in recent years.[1–3] As is often the case the condition was diagnosed only at operation. Extension of the haematoma throughout the abdominal musculature is rare.

Case 2

A 45-year-old woman on regular haemodialysis treatment complained during routine predialysis examination of right-sided, low abdominal pain which had been present for three days. Four days previously she had undergone a seven-hour haemodialysis using R.S.P. Travenol equipment. No heparin was given in the last 90 minutes. At the end of the dialysis the patient vomited several times. During the first night after dialysis she was woken by sudden, severe pain in the adbomen. It seemed, in her words, "as if something had snapped." At the same time she noticed a mass the size of an orange in the abdominal wall. When seen she had a tender mass the size of a tangerine orange in the right lower quadrant, and the skin over it was warm and discoloured. A diagnosis of resolving haematoma was made and conservative treatment decided on. After two months the mass had completely absorbed without aspiration.

Comment.—The haematoma in this case must be classified as spontaneous or idiopathic. The time relationships of the heparin given during dialysis and the vomiting immediately after dialysis to the onset of symptoms were too distant for them to be regarded as causative factors. The onset of sudden, severe pain together with the appearance of a mass in the right lower quadrant of the abdomen was typical. In half the reported cases the haematoma was in this position. Ecchymosis and a raised skin temperature are uncommon findings.

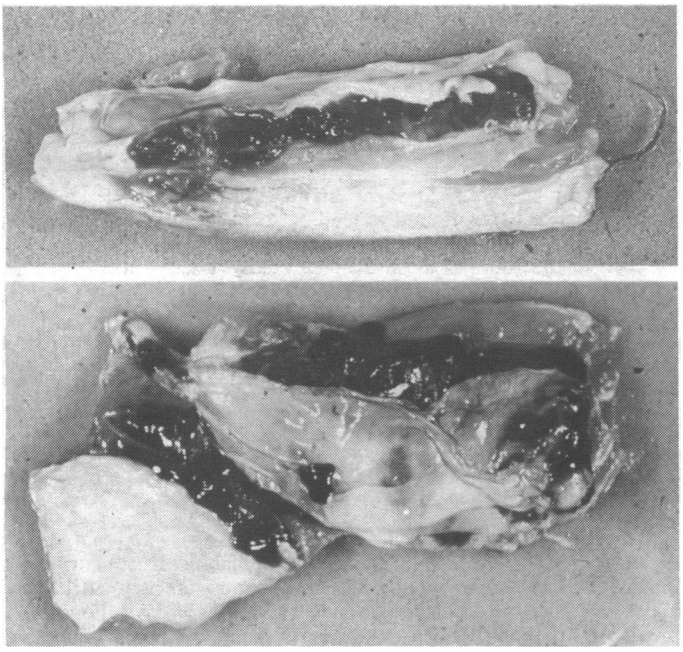
Case 3

The patient, a 35-year-old man with uraemia who had been on haemodialysis for two months, developed cerebral oedema while being dialysed. Peritoneal dialysis was started and hypertonic glucose and cortisone were given. During the next five days his condition improved, but then there were again signs of cerebral oedema. Further peritoneal dialysis was begun, and after the first two litres of dialysate had been collected the patient com-

plained of such severe pain over the left half of the abdomen, with maximum intensity near the umbilicus, that dialysis had to be stopped. On withdrawal of the catheter blood under pressure came from the puncture site. Coagulants and plasma substitutes were given intravenously. After a nasogastric and a rectal tube had been inserted the abdominal pain lessened slightly but spasm of the abdominal wall persisted. Subsequently he became shocked and a diagnosis of haemoperitoneum was made. Owing to persisting shock surgery was delayed. The patient died that evening.

Postmortem examination showed, among other things, subarachnoid haemorrhage, cerebral oedema, bronchopneumonia, haemorrhagic pericarditis, haemoperitoneum, chronic nephritis, splenic infarction, and a hematoma of the left abdominal wall which had destroyed the muscle layers (see Figure).

Comment.—The cause of the haematoma in this case was external trauma. The infiltration of the whole left rectus abdominis muscle was unusual. The haematoma was not diagnosed during life.



Massive haematoma infiltrating left rectus abdominis muscle (Case 3).

Case 4

This patient was a 22-year-old man with uraemia in his second year of chronic dialysis. A year before he had had virus hepatitis followed by postnecrotic cirrhosis. Ascites had developed, and two days previously he had had a paracentesis for the first time. At the end of the seventh hour of dialysis he began to complain of abdominal pain in the lower left quadrant of the abdomen, where the paracentesis had been performed. A mass the size of a tangerine orange was palpable, there was muscle spasm, and the skin temperature was raised. A haematoma was diagnosed and conservative management decided on. The dialysis was stopped and subsequent treatments were given with regional heparinization. The mass disappeared within three weeks.

Comment.—In this case both the paracentesis and the anticoagulant therapy were responsible for the development of the haematoma.

Conclusions

Peritoneal dialysis and haemodialysis should be considered as factors in the aetiology of haematoma of the rectus abdominis muscle. The diagnosis of the condition is difficult. Only two of our four cases were correctly diagnosed. The site and extent of the haematoma was atypical in two cases. Haematomas of the left upper quadrant are rare and haematomas extending into both the upper and the lower part of the left rectus abdominis are even rarer.

Surgery should be considered whenever a diffuse haematoma is suspected. Conservative management is advisable in typical cases in which the haematoma is localized.

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Appendix

Causative and Predisposing Factors in the Aetiology of Haematoma of the Rectus Abdominus Muscle:

INTERNAL TRAUMA—exertion in work, exercise, assuming the upright posture, twisting; pregnancy, labour, and puerperium; vomiting, defaecation, coughing, sneezing, sexual intercourse, convulsions.

EXTERNAL TRAUMA—puncture wounds, blow to abdomen; operative injury to inferior epigastric vessels; paracentesis abdominis.

ANTICOAGULANTS.

DISEASES OR CONDITIONS PRESENT BEFORE OR AT TIME OF HAEMATOMA—asthma, bronchopneumonia, acute bronchitis, coryza, influenza, whooping cough, miliary tuberculosis, typhus fever, typhoid fever, tetanus, lues; vascular degeneration, hypertension, arteriosclerosis, epigastric aneurysm, aortic aneurysm; ascites, tumour, obesity, burns, alcoholism, muscular inanition in wasting diseases, blood dyscrasias, chronic malnutrition.

SPONTANEOUS OR IDIOPATHIC.

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