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Peritoneal mesothelioma

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Summary: We report two patients who presented with small bowel obstruction secondary to peritoneal mesothelioma. The difficulties in establishing this diagnosis at an early stage are illustrated. Recent advances in the management of peritoneal mesothelioma are reviewed.

Introduction

The incidence of peritoneal mesothelioma in the United Kingdom is increasing.[1,2] Until recently, this disease carried a dismal prognosis. However, there is now evidence to suggest that peritoneal mesothelioma may be treatable if it is diagnosed early.[3,4] In order to achieve this, a high index of suspicion, an awareness of any history of asbestos exposure and appropriate investigations are required.[5] We report two cases which highlight the difficulties that may be encountered when applying these principles to clinical practice.

Case reports

Case 1

A 38 year old male presented at another hospital with 'peritonitis' and underwent laparotomy. Haemorrhagic fluid was found in the peritoneal cavity with an 'inflamed' descending and sigmoid colon. The appendix was removed and the pericolic fat and descending colon were biopsied. A defunctioning transverse loop colostomy was fashioned. Histological examination of the pericolic fat was interpreted as showing a reactive mesothelial proliferation. The colonic biopsy and appendix were normal as were a subsequent out-patient barium enema and colonoscopy. One month after his initial laparotomy, his colostomy was closed.

Five months after his initial illness, he presented to the Glasgow Royal Infirmary. He had lost 25 kilograms in weight and, for the 5 days prior to admission, had been vomiting faeculent fluid. Examination revealed a rigid, but non-tender, abdomen. Bowel sounds were present. Plain abdominal radiographs showed evidence of small bowel obstruction. Abdominal ultrasound and barium enema were normal. A small bowel enema demonstrated a dilated proximal jejunum with two areas of narrowing at the pelvic brim. Despite conservative treatment, his symptoms returned one week after admission.

At laparotomy it was impossible to enter the peritoneal cavity, which was obliterated by dense tissue, frozen section examination of which suggested malignant mesothelioma. The abdomen was closed without any procedure being undertaken. The patient died 7 days later. Following his second laparotomy a history of brief exposure to asbestos whilst lagging pipes 20 years previously was noted.

The principal post-mortem finding was a diffuse thickening of the entire peritoneum with encasement of the abdominal viscera and compression of small bowel (Figure 1). Microscopy demonstrated a predominantly tubulo-papillary epithelial pattern of peritoneal mesothelioma. Less well differentiated solid areas were also present, some having a spindle cell appearance. Histochemical stains for mucins were negative. Immunocytochemistry demonstrated diffuse tumour positively with various epithelial markers but carcinoembryonic antigen (CEA) was absent. The original biopsies of pericolic fat, on review, were compatible with mesothelioma.

Case 2

A 54 year old male presented with a 3-day history of vomiting and generalized abdominal pain. He also admitted to recent weight loss of approximately 6 kg. Past history included pulmonary tuberculosis (7 years previously), vagotomy and pyloroplasty for duodenal ulcer (25 years previously) and small bowel resection with division of adhesions for obstruction (2 years previously).

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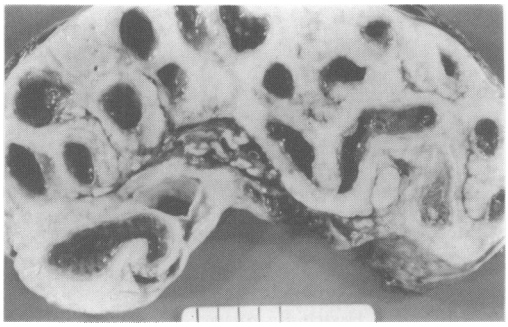

Figure 1 Transverse post-mortem section of abdomen showing visceral encasement by peritoneal mesothelioma. (Scale marked in 1 cm intervals).

Following this last operation, he had had two further episodes of small bowel obstruction which responded to conservative treatment. Physical examination on admission revealed abdominal distension with generalized tenderness but no guarding. Bowel sounds were present. Plain abdominal radiographs demonstrated small bowel obstruction. Chest radiography showed old apical tuberculosis with basal consolidation suggestive of pneumonia. His small bowel obstruction was treated conservatively and resolved over 5 days. Bronchoscopy did not reveal any evidence of tumour. Sputum culture grew *Haemophilus influenza*. The pneumonia responded to ampicillin and physiotherapy. Twelve days after admission, he developed a further small bowel obstruction and required laparotomy. The small bowel was obstructed by multiple, dense adhesions. The peritoneum was studded with small, white plaques throughout the cavity, the naked-eye appearances being suggestive of miliary tuberculosis. The adhesions were divided and one metre of damaged small bowel was resected.

Microscopy of the small bowel showed mucosal changes suggestive of ischaemia and, on the peritoneal surface, proliferating, relatively uniform cells which were diffusely infiltrating the underlying fat and muscle. Histochemical and immunocytochemical staining gave similar results to Case 1. The appearances were interpreted as being an early peritoneal mesothelioma. The patient denied any previous exposure to asbestos.

Postoperatively, the patient's pneumonia recurred and he died 38 days later. Permission for a post-mortem examination was refused.

Discussion

Only 457 cases of peritoneal mesothelioma were registered in England and Wales between 1967 and 1982. Over this period, however, the incidence has doubled.[1] The epidemiology of mesothelioma in Scotland has been shown to be similar to that in other parts of Britain with a male/female ratio of approximately 10:1.[6] An association between asbestos exposure and peritoneal mesothelioma is recognized.[7] There may be a long delay between exposure and manifestation of the disease as illustrated in our first case.

A review of 188 cases listed the common, presenting symptoms as non-specific abdominal pain, weight loss and abdominal distension. Examination revealed ascites in 90% of cases and an abdominal mass less frequently (16%). Intestinal obstruction is a recognized but uncommon presentation.[8] Our first patient presented with the unusual clinical combination of abdominal rigidity in the absence of tenderness. Peritoneal mesothelioma was not considered prior to surgery. The clinical diagnosis of small bowel obstruction secondary to adhesions in the second patient seems reasonable even in retrospect.

Mesothelioma of the peritoneum may exhibit a localized, multinodular or diffuse pattern of growth and, particularly in later stages, may obliterate the peritoneal cavity with encasement of viscera as seen in our first case. A wide range of histological appearances is common even within a single case, but most tumours show a predominantly epithelial pattern often with tubular or tubulo-papillary differentiation.[9] These pathological features are well illustrated in the present two cases. The accurate histological diagnosis of malignant mesothelioma, particularly in small bowel, is a well recognized problem. Histochemical and ultrastructural investigations are not always conclusive and recent studies in pleural mesothelioma suggest that immunocytochemical techniques provide additional useful information. A negative CEA is most helpful in differentiating mesothelioma from adenocarcinoma.[10,11]

A higher index of suspicion and appropriate investigations may have allowed a pre-operative diagnosis in our patients. Computerized tomography can reveal peritoneal mesothelioma and may be used to screen groups exposed to asbestos. Ultrasound guided, fine needle aspiration biopsy can confirm the diagnosis.[5] Recent reports have suggested that peritoneal mesothelioma may respond to a combination of debulking surgery, intraperitoneal chemotherapy and total abdominal radiotherapy in selected patients.[3,4] Prior to this advance in therapy, survival beyond one year was unknown.

In conclusion, peritoneal mesothelioma is an uncommon disease the diagnosis of which must be made early if patients with limited disease are to enjoy the benefits of effective therapy and those with advanced malignancy are to avoid inappropriate surgery.

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