

MRI Appearances of Peritoneal Mesothelioma - A Case Report

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Summary

A rare case of diffuse malignant peritoneal mesothelioma in a 71 year-old Malay man with no previous history of asbestos or radiation exposure is described. The clinical manifestation was a large abdominal mass. At laparotomy he was found to be in the advanced stage of the disease. The tumour was not resectable and patient was sent home. He gradually deteriorated and died three months after diagnosis was made. The magnetic resonance imaging (MRI) features of peritoneal mesothelioma which has not been previously reported are described.

Key Words: Mesothelioma, MRI

Introduction

Mesotheliomas are rare mesenchymal tumours derived from mesothelial cells and can originate in any serous body cavity. The pleura is the commonest site and only 10 - 20% arise in the peritoneum. Chronic exposure to asbestos can induce malignant peritoneal mesothelioma without pulmonary or pleural involvement. The incidence in the population not exposed to asbestos is of one case per million per year. Clinical presentation is often with ascites. There may be an abdominal mass, and pleural effusions can coexist with trans-diaphragmatic spread.

When possible, surgery is performed, with or without associated radiotherapy. Prognosis is nevertheless very poor with median survival being 9 months.

Case Report

A 71 year old man, a retired bus driver, presented with a 3 year history of slowly progressive abdominal distension worse 6 months prior to admission. This was associated with shortness of breath, loss of appetite and loss of weight. He gave no history of exposure to asbestos, thorotrast or radiation.

Clinical examination revealed a diffusely distended abdomen which felt hard on palpation. Surface was smooth to nodular. The systemic review revealed no abnormality. The clinical impression at that time was that of liver metastases.

Abdominal radiograph on admission was unremarkable. A contrast enhanced spiral CT-Scan of the abdomen showed a generalised intra-abdominal soft tissue mass with infiltration of the anterior abdominal wall. The small bowel was encased by the mass but not obstructed. There was no ascites but the right kidney was markedly hydronephrotic. Appearances were non-specific and compatible with an infiltrative mesenteric disease. In view of the CT findings, MRI was done to better define the extent of disease and on operability. On MRI an enormous soft tissue mass occupying the anterior abdomen was demonstrated. The omentum was also involved. On the T1 weighted images the mass appeared of intermediate signal intensity while on T2 weighted images it had low signal (Fig. 1). Following intravenous MR contrast medium it enhanced homogeneously (Fig. 2). Histopathological evaluation of an ultrasound guided biopsy was compatible with that of mesothelioma. Laparotomy was carried out to try and debulk the



Fig. 1: Axial image @ the pelvic inlet using a Gradient-echo T2-weighted image (TR 6.3, TE 3.0, Flip angle 70°, Number of acquisitions 2 and time of acquisition 19 sec) shows tumour mass is of low signal intensity. The high signal seen posteriorly (arrows) is due to inhomogeneity of the magnetic field.

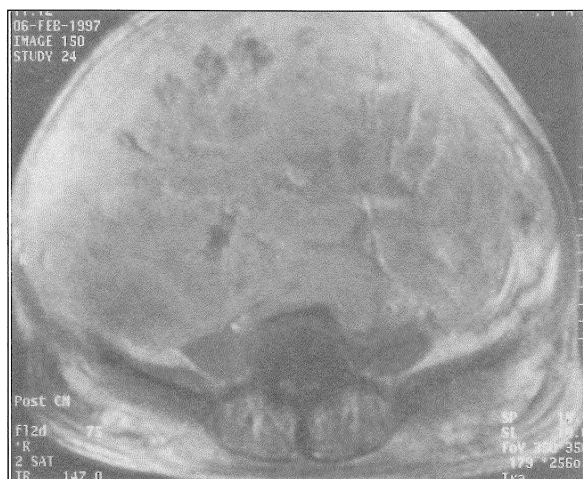


Fig. 2: Gradient-echo post-contrast T1-weighted image (TR 147, TE 4.8, Flip angle 75°, Number of acquisitions 1 and time of acquisition 26 sec) at the same level as Figure 1 shows homogeneous enhancement of the tumour.

neoplasm, but it was found to be inoperable. Patient was discharged on the tenth post-operative day. He gradually deteriorated and died 3 months after the diagnosis.

Discussion

Mesotheliomas are rare mesenchymal tumours derived from mesothelial cells and can originate in any serous body cavity. The pleura is the commonest site with only 10 - 20% arising in the peritoneum. Asbestos, thorotrast and radiation exposure are well-recognised predisposing factors particularly for those of pleural origin. The radiological appearances though suggestive of the diagnosis are non-specific. Mesothelioma may be difficult to differentiate from carcinomatosis, gastrointestinal malignancies, ovarian carcinoma, and, even lymphoma¹. Histological evaluation helps distinguish these conditions providing an accurate morphological diagnosis. Special and immunostains are of use in confirming the morphological diagnosis of mesothelioma and in distinguishing papillary mesothelioma from carcinomas. In rare cases, electron microscopic features may be helpful in furthering a diagnosis of mesothelioma¹.

Patients with peritoneal mesothelioma usually complain of abdominal cramps and increasing girth. Severe weight loss is almost universal and usually by the time the patient seeks medical assistance, abdominal distension is also evident. Nausea, vomiting, bowel obstruction and fever are less common complaints².

The radiological appearances in peritoneal mesothelioma on barium studies include fixation of bowel loops, areas of dilatation and narrowing of small bowel with or without partial obstruction. The masses if present are either sheetlike or irregularly shaped and a well-defined nodular mass is not seen. These configurations may be explained by the fact that mesothelioma is primarily a tumour of the peritoneum and is different from metastatic lesions.

On ultrasound these lesions appear as globular, sheet-like, or irregular masses². In the presence of a large amount of ascites, the peritoneal line is clearly delineated against the echo-free ascitic fluid and nodules

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as small as 2 - 3mm can be visualised². The peritoneal mass is usually less echogenic than the abdominal wall muscles and therefore can be distinguished from them. On CT-scan, peritoneal mesothelioma appears as diffuse irregular thickening of the peritoneum of soft tissue density. A nodular pattern may also be superimposed. A stellate appearance of the involved mesentery with encasement and straightening of the vascular structures has also been reported¹. Increase in the distance between the anterior abdominal wall and bowel as well as increase in density are the other features seen on CT. Ascites is invariably present.

The MRI appearances of peritoneal mesothelioma, which to our knowledge has not been previously reported in the English literature, showed the tumour to be of low signal on T2 weighted images and intermediate signal on T1 weighted images. The tumour mass also showed homogenous enhancement following intravenous dimeglumine gadopentate. MRI,

with its multiplanar imaging capacity and excellent soft-tissue contrast resolution maybe helpful to be better able to define the extent of tumour involvement and operability. However it is commonly believed that MRI like the other imaging modalities cannot differentiate malignant from benign soft-tissue masses. Size, margins, oedema or infiltration of surrounding tissue, intensity and homogeneity of signal, and presence of gadolinium enhancement are all non-specific³.

The prognosis of peritoneal mesothelioma is usually poor. Therapy is still unsuccessful. Surgical excision and radiotherapy are less effective than intraperitoneal chemotherapy which seems to lengthen the average survival rate. Death is usually caused by extensive intra-abdominal disease. In our case, the disease was already too advanced. Debulking of tumour was not possible. Patient gradually deteriorated and died 3 months after diagnosis was made.

References

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