Malignant peritoneal mesothelioma

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ABSTRACT

Malignant peritoneal mesotheliomas are rare tumors arising from the peritoneal surface. We report a 53 year old, non-asbestos exposed Saudi male who presented with exudative ascites. The diagnosis was obtained from laparoscopic biopsy. To the best of our knowledge this entity has not been described in the Saudi community. The aim is to increase the awareness among the medical community about this rare entity.

Keywords: Peritoneal mesotheliomas, non-asbestos exposed.

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Malignant Peritoneal Mesotheliomas (MPM) are rare tumors arising from the peritoneal surface. They are usually diffuse, aggressive and rapidly fatal neoplasms. They constitute one fifth of all mesotheliomas and are usually associated with asbestos exposure.[1]

However there are reported cases of peritoneal mesotheliomas without demonstrable asbestos exposure.[2] The disease commonly affects males over the age of 50 years. Clinically mesothelioma presents with abdominal pain and distension.[3] We present a case of malignant peritoneal mesothelioma in a non-asbestos exposed male who presented with exudative ascites. To the best of our knowledge this entity has not been described in the Saudi community. The aim is to increase the awareness among the medical community about this rare entity.

Case Report. A 53 year old Saudi male presented with 4 months history of anorexia, weight loss, vague abdominal pain and abdominal distension. There was no history of fever, change in bowel habits or jaundice. There was no history of asbestos exposure or past history of tuberculosis. Physical examination revealed an afebrile, cachectic male with ascites and no hepatosplenomegaly. There was no peripheral signs of chronic liver disease, or lymphadenopathy and the jugulo venous pressure was not raised. Laboratory results revealed a hypochromic microcytic anemia with hemoglobin of 10g/DL, white cell count of 7000, platelet count of 551,000 and ESR of 120. Liver function tests were normal except for albumin of 31G/L (35-45 G/L). Ascitic fluid was exudative and showed the following results: Protein content of 58 grams and albumin of 29 grams, with an approximate serum albumin to ascitic fluid albumin ratio of two, white cell count was 400 with 100% lymphocytes, no acid fast bacilli or malignant cells could be detected and adenosine deaminase was 29.6 u/l (6.4 - 23.2 u/l). Hepatitis screen was negative. Chest radiograph was normal and tuberculin test was negative. Esophago gastro duodenoscopy was normal. CT scan abdomen showed massive ascites with omental thickening. No mass lesions or deposits could be seen in the liver, spleen, pancreas or kidneys. On laproscopy there were multiple whitish nodules of variable sizes ranging from 3 to 10 mm, covering visceral as well as parietal peritoneum. Omentum was studied with similar nodules. Right lobe of the liver was seen covered with adhesions and small nodules. Microscopic examination of the omental, peritoneal

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and liver surface nodules showed tumor deposits consisting of clumps and sheets of plump, round or polyhedral cells with voluminous acidophilic cytoplasm. The nuclei were round, relatively uniform, had vesicular chromatin and very prominent large nucleoli. Several mitotic figures were identified. The tumor cells seemed to infiltrate the omental adipose tissue and caused significant desmoplastic response (Figure 1). Immunohistochemical studies were undertaken with formalin-fixed, paraffin embedded material. The Avidin-Biotin immunoperoxidase method was used. A panel of antibodies were applied.

The results were diffuse and strong membranous and cytoplasmic positivity with cytokeratin and epithelial membrane antigen (EMA), while complete negativity with Leu-M1 (CD15), carcinoembryonic antigen (CEA), Alpha-Feto protein (AFP) and B72.3 (Figure 2).

Electron microscopic findings included the presence of large numbers of slender and tall microvilli projecting from the surface of the tumor cells. In addition, well developed desmosomes and bundles of perinuclear tonofilaments were abundant (Figure 3).

Discussion. Malignant peritoneal mesotheliomas (MPM) are rare tumors arising from the serosal surface of the peritoneal cavity. They are more common in men than women. Mesotheliomas are of 4 different histological types: epithelial, sarcomatoid, mixed and undifferentiated.[4] Asbestos exposure constitutes the primary cause of peritonealmesothelioma in humans.[1]

Some of the asbestos fibers that enter the distal airway are eliminated by coughing or swallowing which may be the mechanism for the development of peritoneal mesotheliomas. Cochrane et al[5] reported 70 cases of malignant mesothelioma and found an asbestos exposure history in all but one percent (99%). Peto et al[6] collected a series of cases of malignant mesotheliomas in Los Angeles county and in 101 of the 116 cases the patient or a close relative was interviewed and 69 (68%) reported exposure to asbestos, 22 (22%) reported no exposure to asbestos and in 10 (10%) it could not be determined if asbestos exposure had occurred or not.

However, the tumor exists in a significant proportion of cases without documented asbestos exposure,[2] as was the case with our patient. Newhouse et al[7] collected a series of 83 patients from London hospital with a diagnosis of malignant mesothelioma and only 43 (53%) had a history of exposure to asbestos. McDonald et al[8] studied all fatal malignant mesotheliomas in Canada between 1959 and 1968 and found definite or probable occupational exposure to asbestos in only 20% of the 108 male cases and in 1 (2%) of the 57 female cases.

Various non-asbestos related agents have been thought to induce malignant mesothelioma in animals and possibly in man. The role of radiation in inducing malignant mesothelioma have been studied. Stock et al[9] reported a case of a man who developed malignant peritoneal mesothelioma 16 years

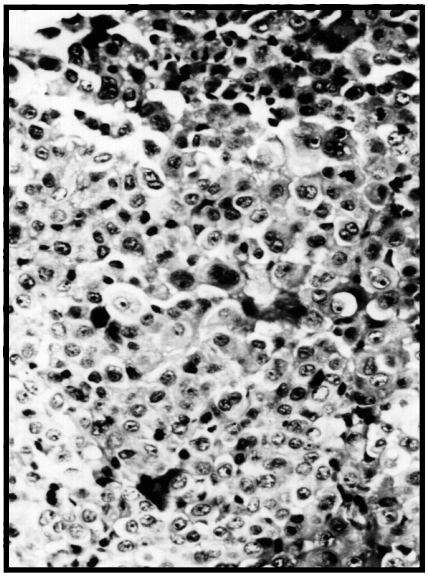

Figure 1 - Photomicrograph showing clusters of malignant mesothelial cells with occasional mitotic figures (hemotoxylin-eosin, original magnification x 400).

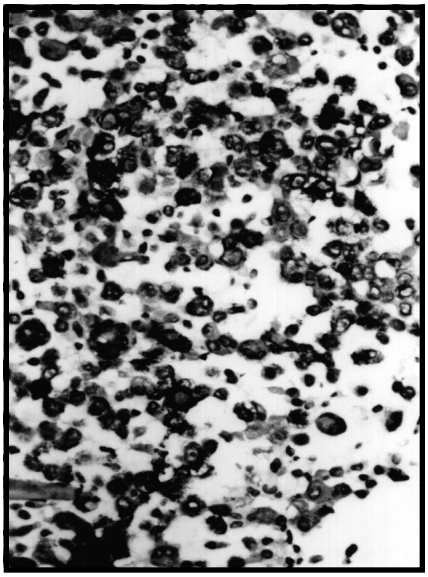

Figure 2 - Immunohistochemical staining with EMA. Note the strong membranous and cytoplasmic staining (diabinobenzide with hematoxylin, original magnification 400).

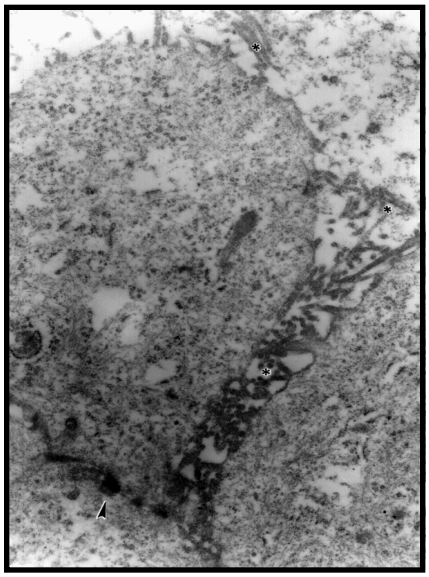

Figure 3 - Electron micrograph showing numerous microvilli on the surface of the tumor cells (stars), and well-developed desmosomes (arrow head) (original magnication x 20,000).

following radiation therapy for seminoma of the testis. Babcock et al[10] reported a case of peritoneal malignant mesothelioma developing in a woman 7 years after internal and external radiation for carcinoma of the cervix. Both of the patients had no history of asbestos exposure.

Other agents like minerals (beryllium), man made mineral fibres, organic chemicals and viruses have been implicated to induce malignant mesothelioma, although the exact mechanism by which these agents induce mesothelioma is unclear.[2]

Peritoneal mesotheliomas commonly present with abdominal pain, abdominal distension or as palpable abdominal masses. Sridhar et al[3] reported 11 patients with malignant peritoneal mesothelioma. Abdominal distension was present in 9 (82%), abdominal pain 9 (82%) and weight loss in 4 (36%) of the 11 cases. The main presenting symptoms in our patient were abdominal pain and distension. Rarely they can present as gastric outlet obstruction,[11] colonic polyp's[12] or as sister Joseph's nodules.[13] These neoplasm are difficult to diagnose, due to their rarity and non-specific symptoms.

Laparoscopy is the diagnostic tool[14] or laparotomy with multiple biopsies from the peritoneum. As in our patient the diagnosis was only revealed after laproscopic peritoneal biopsies. The diagnosis is always based on histopathological appearances including immunocytochemistry and electron microscopy.

Thrombocytosis is known to occur in patients with MPM, as was seen in our patients. It may be due to increased secretion of interleukin-6 by the tumor cells, which promotes thrombogenesis, however the exact pathogenesis remains unclear.[15]

On reviewing the literature, there is no standard treatment regimen for malignant mesothelioma of the peritoneum. Surgical approach does not offer much benefit, as it is not possible to completely remove the tumor bulk. Radiation or chemotherapy also does not have a favorable response rate. Various systemic and intraperitoneal chemotherapeutic regimens have been tried using doxorubicin, ifosamide and cisplatin without a significant improvement in the survival.[16,17] The natural course of the neoplasm is short and the average age at diagnosis is around 60, with median survival of around one year from the time the tumor is diagnosed, inspite of treatment.[3]

In conclusion MPM should be considered in a patient presenting with abdominal pain and distension with intractable ascites. Laproscopy is the diagnostic tool. No definitive treatment is available and the prognosis is poor.

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