A case of primary peritoneal serous papillary carcinoma initially presented by massive bilateral pleural effusions

K. Kaira[1,2], *M.D.*; A. Takise[1], *M.D.*; K. Endou[1], *M.D.*; N. Yanagitani[2], *M.D.*; N. Sunaga[2], *M.D.*; M. Mori[2], *M.D.*

[1]Department of Respiratory Medicine, Maebashi Red Cross Hospital Maebashi, Gunma (Japan)
[2]Department of Medicine and Molecular Science, Gunma University Graduate School of Medicine, Maebashi, Gunma (Japan)

Summary

Primary peritoneal serous papillary carcinoma (PSPC) is a rare primary peritoneal tumor. Clinically, PSPC usually presents with general abdominal discomfort resulting from variable amounts of ascites. In a state of small amounts of ascites, initial manifestation of massive bilateral pleural effusion is unusual. A 76-year-old female nonsmoker with no asbestos exposure complained of dyspnea during exercise. Chest radiograph showed a massive bilateral pleural effusion. Chest computed tomography (CT) revealed irregular pleural thickening and a small amount of ascites. Abdominopelvic CT revealed nodular thickening of the parietal peritoneum, mesenteric or omental nodules, omental cake, and lymphadenopathy in paraaortic regions. Adenocarcinoma cells were found via cytologic examination in bilateral pleural fluids and ascites. Because the primary site of the adenocarcinoma was not found, a surgical biopsy of the right pleural thickening was performed. The final diagnosis was PSPC. The patient was treated with platinum-based chemotherapy. Physicians should be aware of a possibility of PSPC when the radiographic findings show massive bilateral pleural effusion due to pleural carcinomatosis, with high serum levels of CA125.

Key words: Serous papillary carcinoma; Peritoneum; Carcinomatosis; Bilateral pleural effusion.

Introduction

Primary peritoneal serous papillary carcinoma (PSPC) is a rare malignant epithelial tumor characterized by peritoneal carcinomatosis with absent or minimal involvement of the ovaries, with no known primary lesion [1]. It is histologically indistinguishable from ovarian serous papillary carcinoma (OSPC), and was first reported by Swerdlow in 1959 [2]. PSPC is understood as a neoplasm that arises from mesothelial cells under Müllerian influence [3]. The main differential diagnostic consideration includes metastatic adenocarcinoma mainly from ovarian cancer as well as from malignant neoplasms of the gastrointestinal tumor, pseudomyxoma, and malignant mesothelioma. Patients with serous papillary carcinoma are mostly found in a state of peritoneal carcinomatosis, which shows ascites, peritoneal thickening and nodules, and omental caking [4]. Clinically, PSPC usually presents with rapidly progressive abdominal expansion due to unexplained ascites and/or non-specific abdominal complaints. However, even if there are abdominal symptoms due to ascites, massive bilateral pleural effusion as the initial manifestation is uncommon.

We report a case of PSPC initially presenting with massive accumulating pleural effusion without variable amounts of ascites.

Case report

A 76-year-old female nonsmoker with no asbestos exposure complained of dyspnea during exercise for two weeks. She had no significant medical history, and physical examination revealed a healthy woman with normal blood pressure and central venous pressure. There were no enlarged lymph nodes, and heart sounds were normal. Percussion revealed dullness over the basal part of the bilateral lung, and no breath sounds were heard. The abdomen was unremarkable. Routine laboratory investigations showed no abnormalities except for tumor marker. Serum CA19-9 and carcinoembryonic antigen (CEA) values were within normal limits while CA125 was elevated to 514 U/ml (normal 0-35 U/ml).

Chest X-ray showed massive bilateral pleural effusion (Figure 1). Contrast enhanced computed tomography (CT) of the chest revealed irregular pleural thickening and a small amount of ascites (Figure 2). A CT of the abdomen revealed nodular thickening of the parietal peritoneum, mesenteric or omental nodules, omental cake, and lymphadenopathy in paraaortic regions (Figure 3). There was no primary site or obvious pelvic/ovarian mass other than the invasive foci in the peritoneum, detected by ultrasonography or CT. The ovaries and uterus were of normal size. The patient underwent gastrointestinal and colorectal endoscopies, and there were no signs of any malignancy. Adenocarcinoma cells were found via cytologic examination in the exudate of bilateral pleural fluids obtained by thoracocentesis. Cytology of the ascites also revealed adenocarcinoma. Though the radiographic findings revealed peritoneal carcinomatosis, irregular pleural thickening, and bilateral pleural effusion, the primary site of adenocarcinoma was not found. A surgical biopsy of the right pleural thickening (Figure 2) was performed for diagnosis of the primary site. Histopathologic examination revealed moderately to poorly differentiated papillary serous adenocarcinoma with occasional psammoma body formations (Figure 4). The papillary structures were lined by several layers of cells ranging from columnar to oval in shape. Immunohistochemically, the tumor cells predominantly were reactive for Ber-EP4 and keratin, slightly reactive for calretinin, and nonreactive for CEA and surfactant apoprotein. Based on the absence of tumor on the ovaries by exploratory

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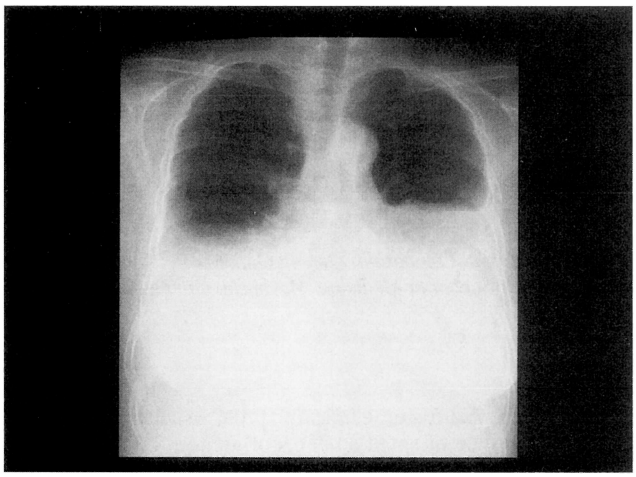
Fig. 1



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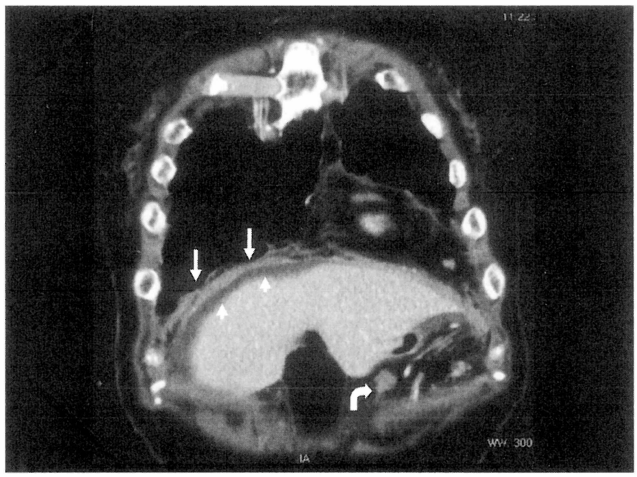
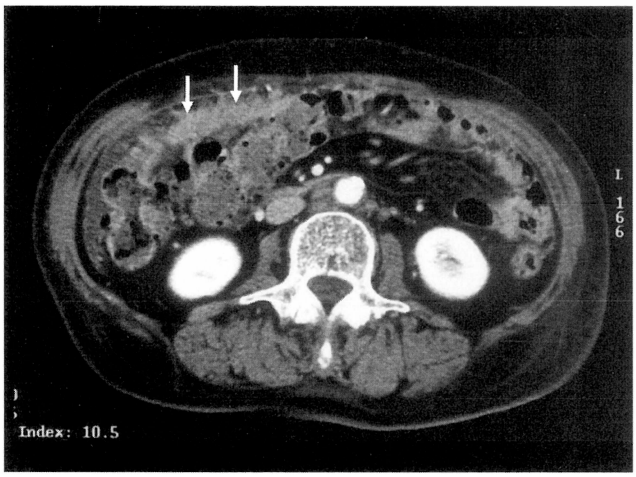


Fig. 3A



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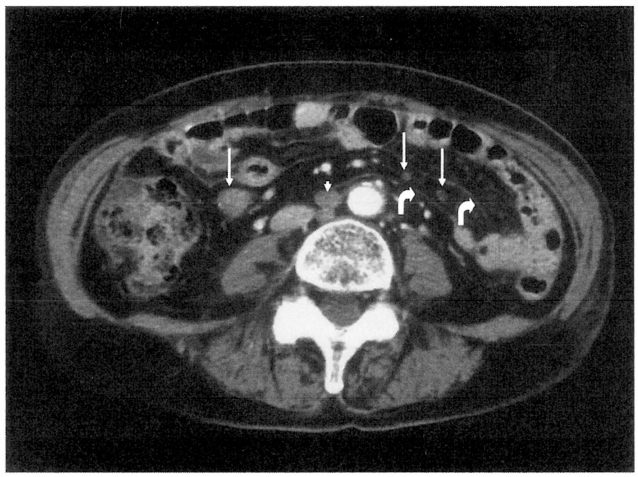

Fig. 4

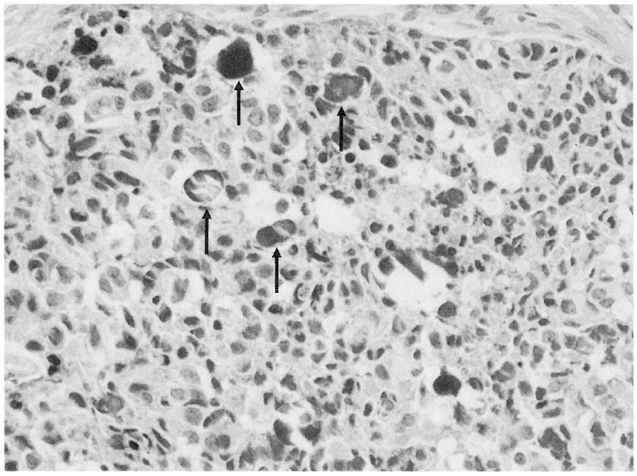

Figure 1. — Chest X-ray demonstrating massive bilateral pleural effusion.

Figure 2. — Reconstructive two-dimensional CT, coronal view demonstrating irregular pleural thickening (arrow), a small amount of ascites (arrowhead), and omental nodule (curved arrow).

Figure 3. — Contrast-enhanced abdominal CT scan demonstrating an omental cake (arrow) (A), mesenteric nodules (arrow), mesenteric marking (curved arrow), and lymphoadenopathy in left paraaortic regions (arrowhead) (B).

Figure 4. — Material of the surgical biopsy demonstrating moderately to poorly differentiated papillary serous adenocarcinoma with occasional psammoma body formations.

laparotomy, the final diagnosis was primary peritoneal serous papillary carcinoma. The patient was given platinum-based chemotherapy and as a result, the massive bilateral pleural effusion completely regressed, and she remains alive.

Discussion

Clinical presentations of PSPC are similar to those of OSPC, and the most common symptoms are general abdominal discomfort resulting from variable amounts of ascites. However, initial attention was focused on a respiratory disease in our patient, as her presenting complaint was shortness of breath and dyspnea, and the finding was massive bilateral pleural effusion. Zissin *et al.* reported the CT findings of 36 women with PSPC [5]. Twenty-seven of the 36 patients presented with non-specific general abdominal symptoms. Though the other nine patients had various clinical manifestations, only one patient complained of dyspnea. Pleural effusion was seen in 11 patients (bilateral in seven). Kebapci *et al.* also

reported bilateral pleural effusion in two of 12 patients [6]. However, there were no cases initially presenting as massive bilateral pleural effusion. If there are general abdominal symptoms secondary to variable amounts of ascites, massive bilateral pleural effusion may not be an uncommon finding. In a state of small amounts of ascites, however, massive bilateral pleural effusion as the initial manifestation is unusual because the presenting features are general abdominal discomfort related to massive ascites due to peritoneal carcinomatosis.

CA125 has been used as an effective tumor marker especially in serous papillary carcinoma [6]. However, high serum levels of CA125 can also be obstained in patients with malignant mesothelioma, neoplastic disease including metastatic gastrointestinal tumor, and benign ovarian tumors, as well as non-neoplastic disease affecting the peritoneum such as tuberculosis, pelvic abscess or endometriomas [6]. Extremely high serum levels (> 500 U/ml) of CA125 have been reported in patients with PSPC, and may be useful in the differential diagnosis.

On morphological grounds, serous papillary carcinoma can closely mimic epithelial subtype malignant mesothelioma. Immunohistochemical procedures have been utilized in aiding the differential diagnosis. Calretinin and Ber-EP4 are useful discriminant markers in distinguishing peritoneal mesothelioma from serous papillary carcinoma [7]. Ber-EP4 showed 95% sensitivity and 91% specificity for serous papillary carcinoma, and calretinin expression showed 88% sensitivity and 100% specificity for malignant mesothelioma [7]. In this case, the tumor cells were predominantly reactive for Ber-EP4, and showed papillary structures with psammoma bodies. The patient satisfied the pathologic criteria for a diagnosis of PSPC, as described by the Gynecologic Oncology Group in 1993 [8]. These criteria included absence of a primary ovarian mass, absence or only microscopic involvement of the ovary, and extraovarian sites that always show greater involvement than is present within either ovary.

The differential diagnosis of pleural carcinomatosis initially presented by massive bilateral pleural effusion are malignant mesothelioma, metastatic malignant neoplasms, and primary lung cancer. In cases of unknown origin, the diagnosis might be difficult. Moreover, special attention should be paid to the pancreas, stomach, colon, and genital organs when interpreting an abdominal CT with findings of peritoneal spread. Differentiating the primary site of origin-unknown carcinomatous peritonitis and pleuritis is a well known dilemma. To clarify the primary site of cancer is important to select chemotherapeutic agents. Thus, the surgical approach to obtain adequate material is necessary for a definite diagnosis, and immunohistochemical study is useful in such differential diagnosis. Physicians shoud be aware of a possibility of PSPC when the radiographic findings show a massive bilateral pleural effusion due to pleural carcinomatosis, with high serum levels of CA125.

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Address reprint requests to:
K. KAIRA, M.D.
Department of Medicine and Molecular Science
Gunma University Graduate School of Medicine
3-39-22, Showa-machi, Maebashi,
Gunma 371-8511 (Japan)