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# Malignant sarcomatoid mesothelioma of the peritoneum: A case report

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## Abstract

Malignant mesothelioma is an aggressive neoplasm that develops in pleura, peritoneum, pericardium and tunica vaginalis of the testes. Most cases are due to asbestos exposure. We report a relatively rare case of malignant sarcomatoid mesothelioma of the peritoneum. This case was a 78-year-old man whose chief complaints were poor appetite, right lower abdominal pain and a palpable abdominal mass for 10 days. He was admitted to our hospital on the same day after an abdominal echo examination at a clinic nearby which showed a mass measuring 95x80mm. Tumor markers were normal. A Computed Tomography (CT) scan of the abdomen and pelvis showed a tumor shadow with a major axis of 14cm on the right side and nodular shadows suspected to be peritoneal dissemination. We performed a resectomy of the tumor on the 12$^{th}$ day after admission. We suspected from the intraoperative findings that this was a Gastrointestinal Stromal Tumor (GIST) which had originated in the omentum. The tumor was resected including a part of the peritoneal membrane. The patient was diagnosed with malignant sarcomatoid mesothelioma of the peritoneum. He was prescribed Pemetrexed and Cisplatin every two weeks from 30 days after surgery. However, 40 days after surgery, the patient died of respiratory obstruction caused by aspiration of vomit. We described a case of malignant sarcomatoid mesothelioma originating in the peritoneum where a period of only 60 days elapsed between the onset of noticeable symptoms and death.

## Keywords

mesothelioma; sarcomatoid peritoneal mesothelioma; asbestos; omentum

## Introduction

Malignant mesothelioma is an aggressive neoplasm that develops in the pleura, peritoneum, pericardium and tunica vaginalis of the testes. Most cases are due to asbestos exposure. The latency period (time between first exposure and diagnosis) is usually 30-50 years.

It is assumed that cases among Japanese people aged 50-89 years will continue to increase until 2027 and more than 60,000 people will die of mesothelioma by 2050 [1].

Pleural mesothelioma is the most common form (80-85%), and peritoneal mesothelioma is the second most common form (10-15%) [2].

The three main histological types, in order of frequency, are epithelioid, biphasic/mixed and sarcomatoid. Patients with biphasic and sarcomatoid variants often don't respond to treatment [2-3].

In this report, we describe a case of sarcomatoid peritoneal mesothelioma.

## Case Presentation

This case was a 78-year-old man whose chief complaints were poor appetite, right lower abdominal pain and a palpable abdominal mass for 10 days. He had no serious medical events except for appendicitis, urinary tract stone, BPPV, hypertension and hyperlipidemiain his past history. He engaged in woodworking for 40 years (20-60 years old) but was never exposed to asbestos occupationally. He had no allergies except to Gadolinium contrast agent. He was admitted to our hospital on the same day after an abdominal echo examination at a clinic nearby which showed a mass measuring 95x80mm.

His height was 160.5cm and weight was 58.5kg. All laboratory data showed within normal ranges except for mild anemia (hemoglobin 12.5 g/dl) and mild hypoalbuminemia (albumin 3.9 g/dl). Tumor markers were also normal (CEA 0.6 ng/mL and CA19-9 2.2 U/mL).A Computed Tomography (CT) scan of the abdomen and pelvis showeda tumor shadow with a major axis of 14cm on the right side and nodular shadows suspected to be peritoneal dissemination (Figure 1A,1B).

Preoperatively, esophagogastroduodenoscopy and colonoscopy showed no abnormal findings except for the stricture at the ascending colon which suggested partial obstruction by the tumor.

We performed a resectomy of the tumor on the 12$^{th}$ day after admission. During the surgery, it was discovered that the tumor was located at the right low side of the abdominal cavity and was adhered to the peritoneal membrane and omentum. The adhesion between the tumor and the omentum was particularly strong. On the other hand, it was not adhered to the digestive tract. We found a massive dissemination to the mesenterium and pouch of Douglas and many small nodules on the surface of the liver which suggested metastasis. We therefore suspected from the intraoperative findings that this was a Gastrointestinal Stromal Tumor (GIST) which had originated in the omentum. The tumor was resected including a part of the peritoneal membrane. After the resection, the abdominal cavity was washed with warm saline.

The patient regained the function of oral intake and was discharged on the 11$^{th}$ day after surgery. We suspected it to be GIST, A type of sarcoma or a musculoskeletal tumor before pathological diagnosis.

However, the patient lost his appetite again10 days after discharge and was readmitted. A CT scan showed a tumor shadow of the major axis on the left side and ascites (Figure2A,2B). Hewas prescribed Pemetrexed (MTA) 250mg/m$^2$ and Cisplatin(CDDP) 37.5mg/m$^2$every two weeks from 30 days after surgery. However, 40 days after surgery, the patient died of respiratory obstruction caused by aspiration of vomit.

### Pathology

Grossly, the tumor was yellow and solid inside (Figure3) and 15x12cm in size. Histologically, the tumor consisted of spindle cells proliferation (Figure 4). Immunohistochemical staining of the tumor showed positive for calretinin, vimentin and CAM5.2 (Figure5A,5B,5C). On the other hand, it was negative for c-kit, CD34, desmin, S-100, DOG1, D2-40, STAT6, ALK1 and Bcl-2. Thus, the patient was diagnosed with malignant sarcomatoid mesothelioma of the peritoneum.

## Discussion

We reported a case of sarcomatoid peritoneal mesothelioma from initial onset of symptoms to the patient's death, a period of 60 days.

Nishi [4] reported that mean survival time for this histological type was 3.2 months which is longer than the survival time of this case.

In Japan, 135 patients were reported to have died of peritoneal mesothelioma in 2015[5]. Sarcomatoid peritoneal mesothelioma was estimated to account for 8.0-12.0% of all peritoneal mesothelioma [4,6-8]. Hence, in Japan, 10-25 persons are estimated to die of sarcomatoid peritoneal mesothelioma every year.

Most cases of mesothelioma are caused by asbestos including occupational and non-occupational exposure. 54.0% of peritoneal mesothelioma patients [6] and 85.4%of pleural mesothelioma patients [9] were reported to have experienced asbestos exposure according to their social and occupational history. This patient was not exposed occupationally.

Intraperitoneal neoplasm and spindle cells with hematoxylin and eosin staining are mainly suggestive of GIST. It was difficult to differentiate GIST from sarcomatoid mesothelioma originating in the peritoneum. Immunohistochemically, most GISTs are positive for c-kit (90~95%) [10] and CD34 (70~80%) [11]. Immunohistochemical staining of sarcomatoid mesothelioma showed active immunoreactivity for calretinin (77.8%), vimentin (91.0%), CAM5.2 (100%), desmin (11.0%) and D2-40 (86.7%) [12-13]. STAT6 was used to distinguish it from hemangiopericytoma and solitary fibrous tumor. ALK1 was used to distinguish it from inflammatory myofibroblastic tumor. Bcl-2 was used to distinguish it from B-cell lymphoma. S-100 was used to distinguish it from chondrosarcoma and GIST. DOG-1 was used to distinguish it from GIST. In view of the results of immunohistochemical staining, it was diagnosed as malignant sarcomatoid mesothelioma.

As the standard treatment for this disorder has not yet been established, it tends to be selected according to pleural mesothelioma [14]. Conventionally, a regimen of Gemcitabine (GEM) in combination with CDDP has been selected as the standard treatment for pleural mesothelioma [15]. A phase III study of MTAplus CDDP in patients with malignant pleural mesothelioma showed a higher response rate and lower mean survival timethan for CDDP alone [16]. In addition, when MTA was covered by health insurance for mesothelioma in 2007, the MTA plus CDDP regimen became the standard treatment. However, a Phase III study of the MTA plus CDDP in patients with malignant peritoneal mesothelioma has not yet been conducted. In this case, the patient was prescribed half of the standard dose of MTA and CDDP because of impaired kidney function (Cre:1.70mg/dl).

However, the relapsed tumor grew rapidly, constricted the gastrointestinal tract and triggeredan episode of vomiting. As a result, before the medication could take effect, the patient died of respiratory obstruction from aspiration of the vomit.

## Conclusion

We described a case of malignant sarcomatoid mesothelioma originating in the peritoneum where a period of only 60 days elapsed between the onset of noticeable symptoms and death.

## Figures

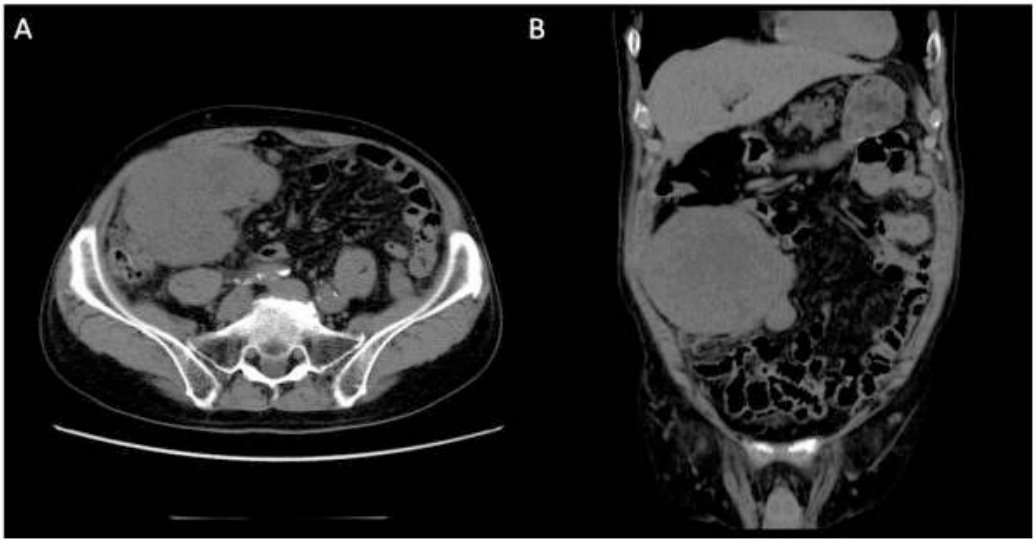


**Figure1**: Preoperative imaging findings, abdominal and pelvic CT scan.

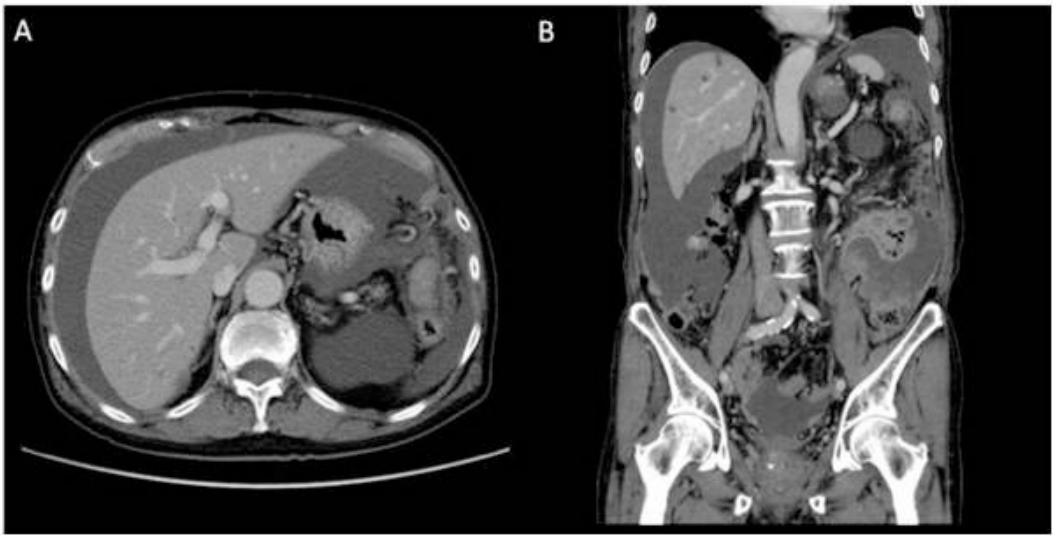


**Figure2**: Postoperative imaging findings,abdominal and pelvic CT scan.

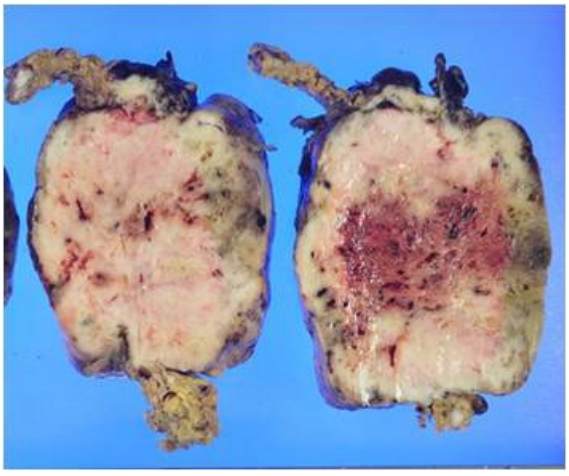

**Figure3**: Pathological image of the tumor, yellow and solid inside(15x12cm)

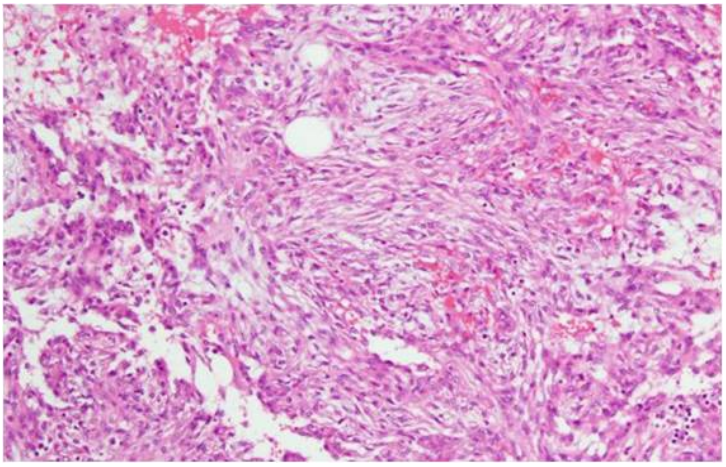

**Figure 4**: Hematoxylin and eosin stain of the tumor

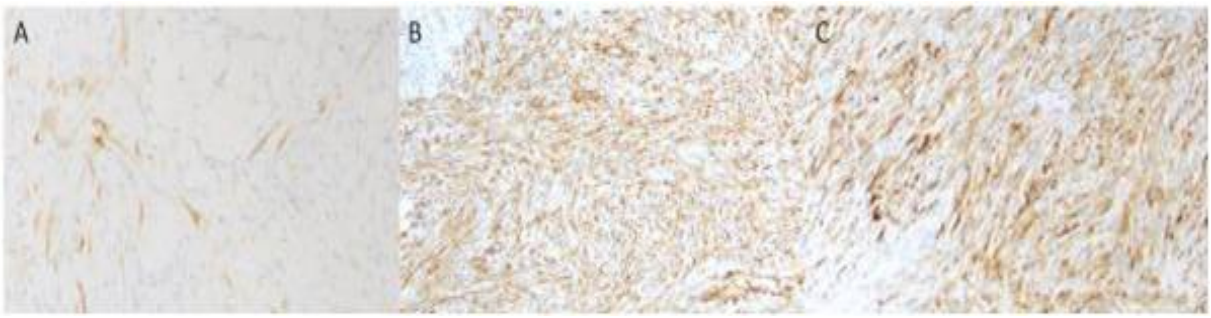


**Figure 5**: Immunohistochemical staining of the tumor, A: Calretinin (weakly+); B: Vimentin (+);C: CAM5.2(+)

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