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Case Report

An unexpected death due to massive ascites and a giant mucinous ovarian cystadenoma

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ABSTRACT

A female in her thirties fell face down in her room. She was motionless when her sister found her. She was transported to the hospital by ambulance and was in a state of cardiopulmonary arrest on admission. She did not respond to resuscitation. Her abdomen had started to swell 3 years before her death. An autopsy was performed to clarify the decedent's cause of death. She was 172 cm tall and weighed 146 kg. Her maximum abdominal girth was 172.1 cm. A subcutaneous hemorrhage measuring 4.5 cm in diameter was observed in the epigastric region. The abdominal cavity contained brownish ascites (54.1 L). The left ovary was markedly swollen, and the combined weight of the uterus and right ovary was more than 13.0 kg. A left ovarian tumor consisting of serous and mucinous cysts was detected. There were no metastatic lesions in the peritoneum or other organs. She might have suffered circulatory disturbance caused by the ascites and ovarian tumor. Moreover, being in a prone position would have resulted in an increase in intra-abdominal pressure, further exacerbating her circulatory problems. Therefore, her cause of death was considered to be circulatory failure caused by significant ascites and a large ovarian tumor.

1. Introduction

Ascites involves the accumulation of fluid within the peritoneal cavity. The most common cause of ascites is liver cirrhosis. Ascites combined with cirrhosis can be caused by portal hypertension, renal salt, and water retention. Ascites in the absence of cirrhosis is generally caused by peritoneal carcinomatosis, peritoneal infection, or pancreatic disease [1]. In the field of gynecology, the presence of ascites usually leads to a strong suspicion of a malignant tumor (often of the ovary). Meigs' syndrome is also associated with ascites and pleural effusion [2]. In patients with massive ascites, death can occur due to spontaneous bacterial peritonitis, nephrotic syndrome, heart failure, or acute liver failure as a complication of cirrhotic ascites.

We report a fatal case of massive ascites combined with a large ovarian tumor, in which the decedent's cause of death was considered to be acute circulatory failure.

2. Case report

One night, a female in her 30 s fell face down in her room. She could not stand up and eventually stopped moving. Her sister, who was sleeping nearby, found her. She was transported to the hospital by ambulance. On admission, she was in a state of cardiopulmonary arrest. She did not respond to resuscitation.

She had been obese since childhood. Her abdomen had begun to swell about 3 years before her death; however, she did not consult a doctor about it. Computed tomography of the abdomen and pelvis could not be performed in this case due to marked abdominal enlargement. An autopsy was carried out about 17 h after her death.

2.1. Autopsy findings

The deceased was 172 cm tall and weighed 146 kg (Fig. 1). Her abdomen was extremely swollen. Specifically, her maximum abdominal girth was 172.1 cm (at 20 cm above the navel). Edema was seen throughout her lower extremities, particularly on the

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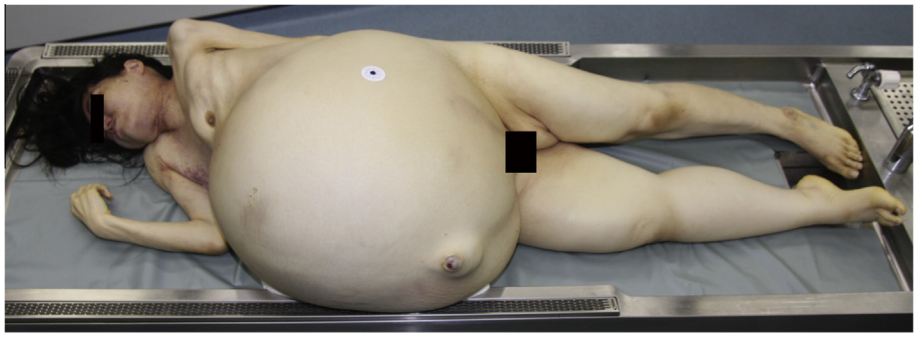

Fig. 1. The patient's abdomen was extremely swollen.

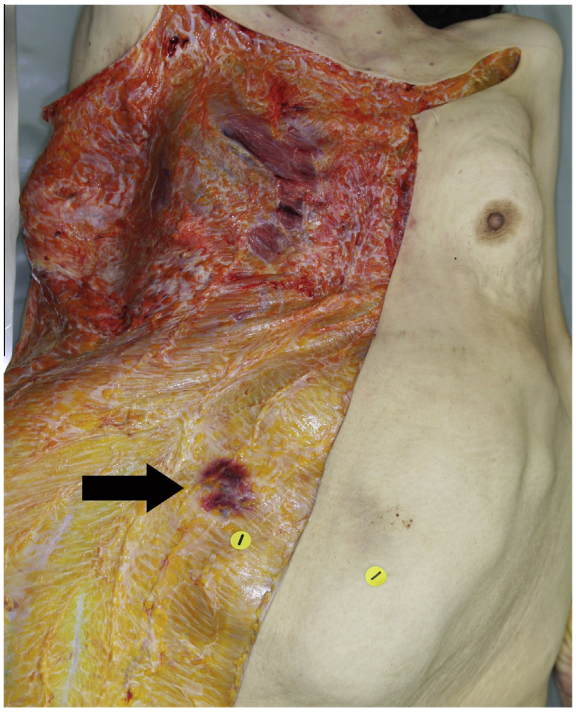

Fig. 2. A subcutaneous hemorrhage was observed in the epigastric region (arrow).

right side. The autopsy revealed a subcutaneous hemorrhage measuring 4.5 cm in diameter in the epigastric region (Fig. 2).

Dark brown ascites (54.1 L) was seen in the abdominal cavity. The left ovary was markedly swollen (size: 40.0 × 41.5 × 19.0 cm, weight: approx. 13 kg, after the removal of 1.6 L of dark brown fluid) (Fig. 3) and had adhered to the serosal surface of the abdomen. A brownish viscous substance had adhered to the entire peritoneum. The left ovarian swelling was found to have been caused by a tumor that consisted of serous and mucinous cysts. The cysts were multilocular and had thick walls. The abdominal viscera and diaphragm had been displaced superiorly by the ovarian tumor. The right ovary was intact. The appendix was intact and 7.8 cm long. There were no metastases in the peritoneum or other organs. Both kidneys exhibited hydronephrosis. Some of the patient's cardiac blood had coagulated.

2.2. Pathological findings

The left ovarian tumor contained mucus-filled proliferative cysts, the walls of which consisted of columnar epithelial cells (Fig. 4a). No atypical findings were seen in the epithelium (Fig. 4b). However, neutrophil infiltration was noted in the interstitium and cysts (Fig. 4c).

Several small focal fibrin deposits were observed in small renal arteries (Fig. 5). The glomeruli were ischemic. There were no significant findings that were indicative of other diseases or pathological changes.

2.3. Examination of ascites

An examination of the ascites revealed that it had a pH of 7.5 and a protein content of 5.3 g/dl. The types of cells within the ascites could not be determined because of postmortem cell degeneration. The numbers of red and white blood cells were uncountable.

3. Discussion

3.1. Cause and volume of ascites

Massive ascites have been detected in patients with various conditions, such as alcoholic cirrhosis (23 L) [3], a pancreatic pseudocyst (3.5 L) [4], and peritoneal malignant mesothelioma (7.5 L) [5]. Our case involved massive ascites (54.1 L) and a large ovarian tumor (13 kg). The combination of an ovarian tumor, especially ovarian fibroma; ascites; and hydrothorax is known as Meigs' syndrome [6–8]. However, no significant hydrothorax was seen in our case. Among ovarian tumors containing over 40 L of cyst contents, ovarian cysts are the most commonly reported type of tumor [9,10], and the largest ovarian tumor ever documented weighed 149 kg and was removed in 1905 [11]. Mucinous cystadenoma, another type of ovarian tumor, was also reported to cause marked abdominal swelling [12–15]; however, the present case might be the first reported case in which a mucinous ovarian tumor was found in combination with massive ascites.

In our case, the left ovarian tumor was diagnosed as a mucinous cystadenoma, which was confirmed pathologically. Benign mucinous cysts and cystadenomas comprise 20–25% of all benign ovarian neoplasms and 75–85% of all ovarian mucinous tumors and tend to occur at a relatively young age; i.e., 30–50 years [16,17]. Ten percent of mucinous cystadenomas are bilateral [18].

In the current case, massive ascites was observed in spite of the fact that the tumor was benign. The color of the ascites was dark brown, as were the cyst contents. Although the ruptured site was not observed clearly, the ovarian cyst might have burst in the past. So, it was considered that the massive ascites might have contained large amounts of the cyst contents. The ascites contained countless numbers of red and white blood cells and also had a high protein concentration (5.3 g/dl). Neutrophil infiltration was noted in the interstitium and cysts. In addition, the entire peritoneum