Twinkle 東京女子医科大学学術リポジトリ
Tokyo Women's Medical University - Information & Knowledge Database
https://twinkle.repo.nii.ac.jp

A Case of Unexplained Pleural Effusion Diagnosed as Meigs' Syndrome

メタデータ	言語: eng 出版者: 公開日: 2020-07-15 キーワード (Ja): キーワード (En): 作成者: MITSUBOSHI, Shota, MATSUMOTO, Takako, ISAKA, Tamami, KUMAKIRI, Jun, YAMAMOTO, Tomoko, KANZAKI, Masato メールアドレス: 所属:
URL	http://hdl.handle.net/10470/00032481

CC BY

TWMUJ 3: 69-72, 2019

Case Report

A Case of Unexplained Pleural Effusion Diagnosed as Meigs' Syndrome

Shota Mitsuboshi,[1] **Takako Matsumoto,**[1] **Tamami Isaka,**[1]
Jun Kumakiri,[2] **Tomoko Yamamoto,**[3] and **Masato Kanzaki**[1]

[1]Department of Thoracic Surgery, Tokyo Women's Medical University, Tokyo, Japan
[2]Department of Obstetrics and Gynecology, Tokyo Women's Medical University, Tokyo, Japan
[3]Department of Surgical Pathology, Tokyo Women's Medical University, Tokyo, Japan

(Accepted August 1, 2019)
(Advance Publication by J-STAGE September 24, 2019)

Meigs' syndrome (MS) is defined as a benign ovarian tumor with pleural effusion and ascites, which, resolve after its removal. The pathogenesis of ascites and pleural effusion in MS is unknown. A 64-year-old woman with a history of uterine fibroid was admitted owing to dyspnea over 1 month. A chest radiograph showed right hydrothorax. Carbohydrate antigen 125 (CA-125) level was 645 U/mL. Computed tomography of chest, abdominal, and pelvis showed hydrothorax in the right thoracic cavity and atelectasis of the right lower lobe, a tumor, 14 cm in diameter, and ascites in the pelvis. Despite chest drainage for hydrothorax, the amount of pleural effusion was over 300 ml/days every day. Pleural fluid was a lymphocyte-predominant exudate. The bacterial mycobacterial cultures of the pleural fluid were negative. Cytological examination of the pleural fluid showed no malignancy. As the combination of pleural effusion, ascites, and ovarian tumor was suggestive of MS, the patient was referred to the Department of Gynecology. She underwent total hysterectomy and bilateral salpingo-oophorectomy. Histopathological examination of the resected tumor confirmed fibrothecoma. Thus, it is important to consider the possibility of MS in female patients with unexplained pleural effusion and an ovarian tumor.

Key Words: Meigs' syndrome, pleural effusion, CA-125, ovarian fibrothecoma

Introduction

In 1937, Meigs and Cass reported a series of seven patients with ascites and pleural effusion associated with benign ovarian fibroma.[1] Subsequently, this condition was defined as Meigs' syndorome (MS). MS has the following four characteristics: (i) benign ovarian fibroma or fibroma-like tumor; (ii) ascites; (iii) pleural effusion; and (iv) rapid resolution of ascites and pleural effusion after removal of the tumor.[2]

Case Presentation

A 64-year-old woman with a history of uterine fibroid was admitted owing to dyspnea over 1 month. She had a past history of uterine fibroid, hypertension, hyperlipidemia, and gastro-esophageal reflux disease.

On admission, her vital signs showed no abnormali-

Corresponding Author: Masato Kanzaki, Department of Thoracic Surgery, Tokyo Women's Medical University, 8-1 Kawada-cho, Shinjuku-ku, Tokyo 162-8666, Japan. kanzaki.masato@twmu.ac.jp
doi: 10.24488/twmuj.2019001
Copyright Ⓒ 2019 Society of Tokyo Women's Medical University. This is an open access article distributed under the terms of Creative Commons Attribution License (CC BY), which permits unrestricted use, distribution, and reproduction in any medium, provided the original source is properly credited.

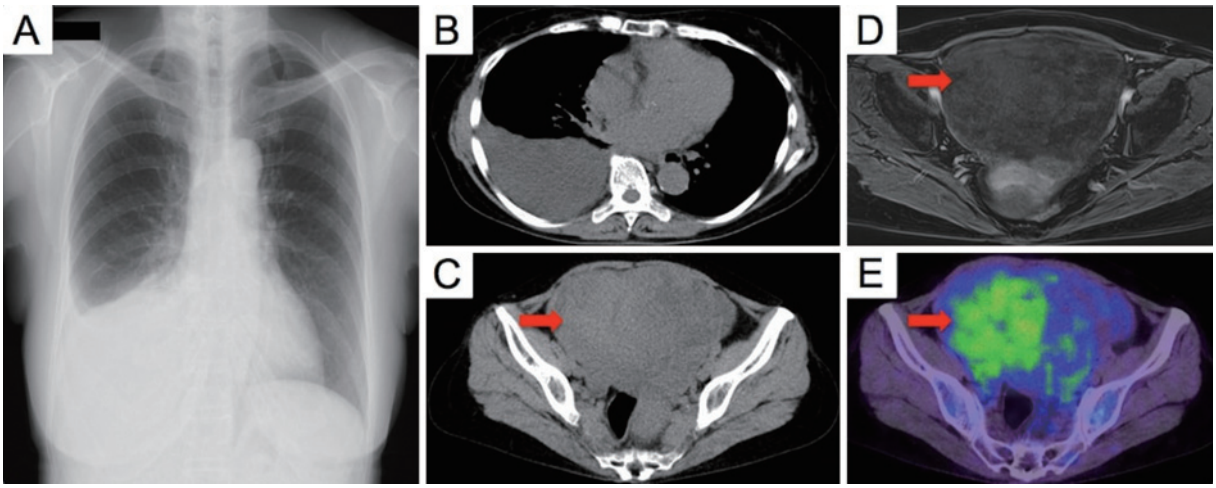

Figure 1 Imaging findings.
(A) Chest radiograph showing right hydrothorax.
(B) Chest computed tomogram (CT) of the patient showing hydrothorax in the right thoracic cavity and atelectasis of the right lower lobe.
(C) Abdominal CT of the patient showing a tumor, approximately 14 cm in diameter, in the pelvis (red arrow).
(D) Abdominal gadolinium-enhanced magnetic resonance imaging of the patient showing a poor enhancement tumor, approximately 14 cm in diameter, connected with the ovarian membrane (red arrow).
(E) Fluorodeoxyglucose-positron emission tomogram (FDG-PET) of the patient showing an abnormal uptake of FDG with a maximum standardized uptake value of 3.53 in the tumor (red arrow).

ties; the respiratory rate was 18 breaths per minutes, and oxygen saturation was 98% in room air. Laboratory data revealed a serum total protein (TP) level of 6.7 g/dL, serum lactate dehydrogenase (LDH) levels of 191 U/L, and serum carbohydrate antigen 125 (CA-125) level of 645 U/mL (normal, below 37 U/mL). Chest radiograph was suggestive of right hydrothorax (**Figure 1A**). Computed tomography (CT) of chest showed hydrothorax in the right thoracic cavity and atelectasis of the right lower lobe (**Figure 1B**). Abdominal CT showed a tumor, approximately 14 cm in diameter, and ascites in the pelvis (**Figure 1C**). An abdominal gadolinium-enhanced magnetic resonance imaging (MRI) showed a poor enhancement tumor of approximately 14 cm diameter connected with ovarian membrane (**Figure 1D**). Fluorodeoxyglucose-positron emission tomography (FDG-PET) showed abdominal uptake of FDG with a maximum standardized uptake value of 3.53 in the tumor (**Figure 1E**). Despite chest drainage for the hydrothorax, the amount of pleural effusion was over 300 ml/day every day. The drained pleural fluid was found to be a lymphocyte-predominant, serous exudate with TP level of 5.0 g/dL and LDH level of 140 U/L in the pleural fluid, which fulfilled the Light's criteria for exudate. The adenosine deaminase (ADA) and CA-125 levels in pleural fluid were 5.7 IU/L and 213 U/mL (normal, below 37 U/mL), respectively. The pleural fluid white blood cell count was 575/μL, with approximately 90%, lymphocytes. The pleural fluid cultures were negative for mycobacteria. The cytological examination of the pleural fluid showed no malignancy.

As the combined presence of pleural effusion, ascites, and ovarian tumor was suggestive of MS, the patient was referred to the Department of Gynecology and underwent total hysterectomy and bilateral salpingo-oophorectomy. A cytological examination of the serous ascites showed no malignancy. Histopathological examination confirmed the resected tumor as fibrothecoma (**Figure 2A**). Immunohistochemical analysis revealed that the tumor was positive for vascular endothelial growth factor (VEGF) (**Figure 2B**).

The chest and abdominal drains were removed on the third postoperative day owing to a decrease in the amount of pleural effusion and ascites. The patient was discharged on the seventh postoperative day, and no recurrence of the hydrothorax was observed for 8 months

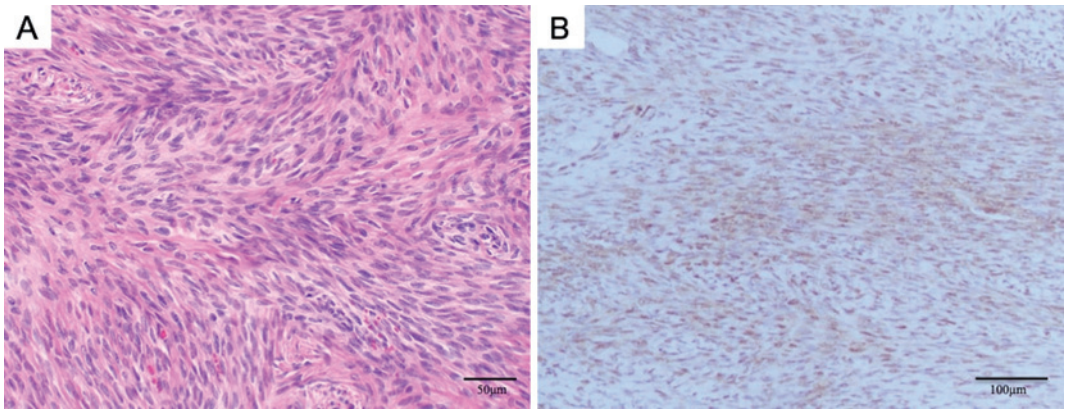

Figure 2 Histological and immunohistochemical findings of the resected tumor.
(A) In hematoxylin and eosin staining, microscopic examination indicated spindle cells were arranged in a palisaded pattern and spindle shaped nuclei were without atypia change. The resected tumor confirms as a fibrothecoma.
(B) Immunohistochemical analysis revealed that the tumor was positive for vascular endothelial growth factor.

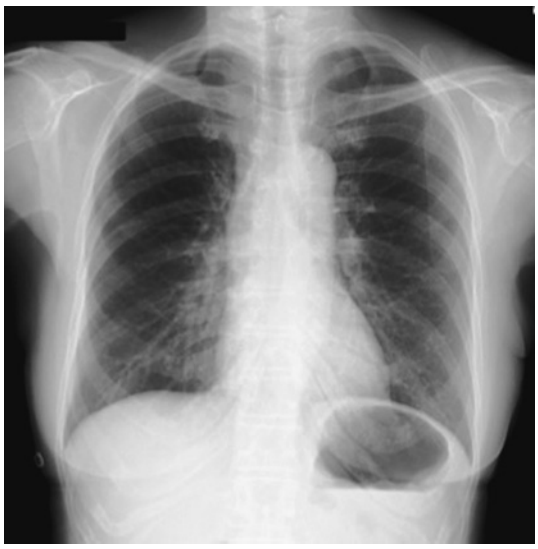

Figure 3 Postoperative chest radiograph of the patient showing absence of right hydrothorax.

(**Figure 3**).

Discussion

MS accounts for approximately 1% of ovarian tumors, ovarian fibromas are found in 2-5% of surgically removed ovarian tumors. Approximately 10-15% of women with an ovarian fibroma have ascites, and 1% have hydrothorax. Approximately 70% of the pleural effusions are right-sided, while 15% are left-sided, and 15% are bilateral.[3] The pathogenesis of ascites and pleural effusion in MS is unknown. Ascites may result from edematous fibromas that leak fluid or the increased lymphangial pressure in the abdomen and pelvis caused by the tumor itself. It has been suggested that pleural effusion arises when ascites moves from the peritoneal cavity to the pleural cavity through diaphragmatic defects or diaphragmatic lymphatics.[2] Because the lymphatics are abundant on the right side of the diaphragm, pleural effusion is often seen on the right side. Terada et al.[4] reported ascites transfer into the thoracic cavity by using ^{99m}Tc-macro-aggregated albumin radioscintigraphy. In this case, the amount of pleural effusion was more than that of the ascites. It is considered that diaphragmatic defects and diaphragmatic lymphatics had developed. Another theory is that the proteins, such as VEGF that increase the capillary permeability and some inflammatory cytokines, including interleukin (IL)-1β, IL-6, and IL-8 are possible etiologies of ascites and pleural effusion.[5] In a previous report, VEGF was associated with the production of peritoneal and pleural effusion in patients with malignant and nonmalignant diseases.[6] The increase in VEGF levels in serum, peritoneal, and pleural effusion in MS may be attributed to VEGF production by the tumor.[7] Expression of VEGF by tumor cells was also reported in patients with pseudo-MS.[8] We suggest that VEGF expression by the ovarian tumor cells may have triggered development of peritoneal and pleural effusion in our patient.

Pleural fluid analysis is important for diagnosis, and it is classified as either an exudate or a transudate according to the Light's criteria using serum and pleural fluid TP and LDH.[9] According to a systematic review of 653 studies on MS, a majority of the pleural effusions in patients were exudates.[10] In this case, as the pleural fluid was a lymphocyte-predominant exudate, differentiation from tuberculosis pleurisy was necessary. Diagnosis of tuberculosis pleurisy cannot be ruled out only by negative mycobacterial culture, and it is necessary to evaluate the pleural biopsy, pleural culture, and pleural fluid ADA level.[11] In this case, pleural effusion was unlikely to be caused by tuberculosis pleurisy because of the negative mycobacterial culture and normal ADA level findings.

The increase in the tumor maker, CA-125, levels to 80% is confounding factor in ovarian malignancy as well as in other benign tumors and malignancies.[12] CA-125 antigen is expressed in the amnion and embryonic coelomic epithelium. The antigen can also appear in many adult tissues, including the epithelium of fallopian tubes, endometrium, endocervix, ovaries, peritoneum, and pleura.[13] Some normal body tissues can produce a low level of CA-125 in the serum. CA-125 level is elevated in menstruation or pregnancy and some benign conditions, such as endometriosis, peritonitis, cirrhosis, or ascites. There are some case reports of MS with elevation of CA-125 level.[14] In our case, elevation of CA-125 level in the patient with MS was attributed to ascites.

Treatment of MS comprises removal of the tumor, and pleural effusion and ascites decrease rapidly after the removal. In this case, pleural effusion decreased significantly after the removal, and the disappearance of pleural effusion was recognized on the third postoperative day.

Conclusion

This was a case of MS with pleural effusion. It is important to consider the possibility of MS in female patients with unexplained pleural effusion and an ovarian tumor. Although a malignancy must be suspected in all patients with unexplained pleural effusion, MS can be successfully treated by tumor removal.

Conflicts of Interest: The authors declare that they have no conflict of interest.

References

1. Meigs JV, Cass JW: Fibroma of the ovary with ascites and hydrothorax: with a report seven cases. Am J Obstet Gynecol 33: 249–267, 1937
2. Meigs JV: Fibroma of the ovary with ascites and hydrothorax; Meigs' syndrome. Am J Obstet Gynecol 67: 962–985, 1954
3. Saha S, Robertson M: Meigs' and Pseudo-Meigs' syndrome. Australas J Ultrasound Med 15: 29–31, 2012
4. Terada S, Suzuki N, Uchide K et al: Uterine leiomyoma associated with ascites and hydrothorax. Gynecol Obstet Invest 33: 54–58, 1992
5. Abramov Y, Anteby SO, Fasouliotis SJ et al: The role of inflammatory cytokines in Meigs' syndrome. Obstet Gynecol 99: 917–919, 2002
6. Kraft A, Weindel K, Ochs A et al: Vascular endothelial growth factor in the sera and effusions of patients with malignant and nonmalignant disease. Cancer 85: 178–187, 1999
7. Ishiko O, Yoshida H, Sumi T et al: Vascular endothelial growth factor levels in pleural and peritoneal fluid in Meigs' syndrome. Eur J Obstet Gynecol Reprod Biol 98: 129–130, 2001
8. Okuchi Y, Nagayama S, Mori Y et al: VEGF hypersecretion as a plausible mechanism for pseudo-meigs' syndrome in advanced colorectal cancer. Jpn J Clin Oncol 40: 476–481, 2010
9. Light RW, Macgregor MI, Luchsinger PC et al: Pleural effusions: the diagnostic separation of transudates and exudates. Ann Intern Med 77: 507–513, 1972
10. Krenke R, Maskey-Warzechowska M, Korczynski P et al: Pleural Effusion in Meigs' Syndrome-Transudate or Exudate? Systematic review of the literature. Medicine (Baltimore) 94: e2114, 2015
11. Seibert AF, Haynes J Jr, Middleton R et al: Tuberculous pleural effusion. Twenty-year experience. Chest 99: 883–886, 1991
12. Mui MP, Tam KF, Tam FK et al: Coexistence of struma ovarii with marked ascites and elevated CA-125 levels: case report and literature review. Arch Gynecol Obstet 279: 753–757, 2009
13. Kabawat SE, Bast RC Jr, Bhan AK et al: Tissue distribution of a coelomic-epithelium-related antigen recognized by the monoclonal antibody OC125. Int J Gynecol Pathol 2: 275–285, 1983
14. Park JW, Bae JW: Postmenopausal Meigs' syndrome in elevated CA-125: A case report. J Menopausal Med 21: 56–59, 2015