

Meigs' Syndrome in a Young Woman with a Normal Serum CA-125 Level

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We report on a 27-year-old woman who presented with an ovarian solid tumor (20 x 15 cm) and massive ascites. A physical examination and chest X-ray revealed a moderate amount of pleural effusion on the right side. Cytologic study of the pleural effusion showed reactive mesothelial cells without evidence of malignancy. Gram's stain was negative. The blood chemistry was within normal limits. The serum CA-125 level was 22 (normal, < 35) U/ml, the alpha-fetoprotein (AFP) level was 8 (normal, < 20) ng/ml, and the carcinoembryonic antigen (CEA) was 0.5 (normal, < 5) ng/ml.

An explorative laparotomy revealed approximately 1500 ml of serous ascites and a very large multilobulated left adnexal mass (20 x 15 cm) with no malignant cytology in the ascitic fluid. Postoperatively, the pleural effusion spontaneously resolved, and the microscopic examination revealed a benign fibroma-thecoma, confirming the diagnosis of Meigs' syndrome. The symptoms resolved after removal of this pelvic tumor. This is an unusual case of a young female with Meigs' syndrome and a normal serum CA-125 level. (*Chang Gung Med J* 2005;28:587-91)

Key words: Meigs' syndrome, CA-125.

Pleural effusion in a patient with a presumed ovarian tumor is often a poor prognostic sign. However, pleural effusion in the context of ovarian tumors can occur as part of Meigs' syndrome, where the ovarian tumor and pleuroperitoneal effusions are benign and resolve on resection of the tumor. These patients generally have a good prognosis.

In 1989, Jones et al. first described a case of Meigs' syndrome with an elevated serum CA-125 level.⁽¹⁾ Subsequently, several authors reported cases of Meigs' syndrome associated with elevated serum CA-125 levels, but Vasilev et al. reported 2 ovarian fibromas with CA-125 of < 35 U/ml without describing any additional findings.⁽²⁾ We report on a case of a young female with Meigs' syndrome and a normal serum CA-125 level and review the literature related

to this unusual entity. The significance of Meigs' syndrome lies in the fact that neither ascites nor the pleural effusion is necessarily an ominous sign in women with a pelvic tumor.

CASE REPORT

A 27-year-old woman (gravida 0, para 0) presented to a general practitioner with lower abdominal pain and distension for 3 weeks. A palpable pelvic mass was noted to reach the umbilicus, and an abdominal ultrasound examination done by a local medical practitioner revealed a solid mass (20 x 15 cm) arising from the pelvic cavity. A physical examination revealed dullness to percussion with decreased breathing sounds in the lower half of the

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right lung field and a shifting dullness in the lower abdominal region. She was referred to our hospital, and an exploratory laparotomy was suggested under the impression of a pelvic mass arising from the female reproductive system. A gynecological ultrasound examination confirmed the presence of massive ascites and a large oval-shaped homogenous mass (20 x 15 cm) above the fundus of the uterus. Intravenous urography revealed bilateral mild hydronephrosis, a soft tissue pelvic mass containing no calcification, and lateral displacement of the uterus. A barium enema of the large bowel showed extrinsic compression of the rectum, and colon sigmoideum and descendens. The blood chemistry was within normal limits. The serum CA-125 level was 22 U/ml, the alpha-fetoprotein (AFP) level was 8 ng/ml, and the carcinoembryonic antigen (CEA) was 0.5 ng/ml. A chest X-ray revealed massive right-side and minimal left-side pleural effusion (Fig. 1), thus, the explorative laparotomy was postponed, and the patient was referred to the chest medical department for further work-up.

Thoracentesis yielded 100 ml of fluid containing reactive mesothelial cells without evidence of malignancy noted on the cytologic review. Gram's stain and acid-fast stains were also negative. Biochemical analysis of the pleural fluid showed the following values: total protein of 5.2 g/dl, albumin of 3.0 g/dl, glucose of 91 mg/dl, lactate dehydrogenase (LDH) of 101 mU/ml, sodium of 143 meq/l, potassium of 3.7 meq/l, and a specific gravity of 1.033. It was recommended that the patient undergo the



Fig. 1 Chest X-ray revealing massive right-side pleural effusion.

explorative laparotomy as scheduled owing to a lack of evidence of any association with chest medical disorders.

An explorative laparotomy was performed through a midline incision. There was approximately 1500 ml of serous ascites, and after aspiration of the ascitic fluid, a very large multilobulated left adnexal mass (20 x 15 cm) without excrescences was found. The right ovary, uterus, and tubes were unremarkable. No deposits or masses were palpated in the omentum, peritoneum, liver, or bowel. A left oophorectomy was performed, and the tumor weighed 935 g. The tumor was rounded, smooth, firm, and lacking a definite capsule. On sectioning, the tumor was densely fibrous, with much stromal connective tissue. A stained section of the tumor showed connective-tissue elements which contained bunches of spindle cells with areas of interstitial hyalinization and focal edema and with interspersed islands of strands of thecoma cells.

The postoperative course was uneventful, and her condition improved after removal of the pelvic tumor. She was seen in the clinic after 6 weeks, and the follow-up chest X-ray showed mild elevation of the right diaphragm with minimal right-side pleural effusion (Fig. 2). The patient was free of ascites and hydrothorax at 16 weeks after the operation.

DISCUSSION

In 1937, Meigs and Cass reported a series of 7

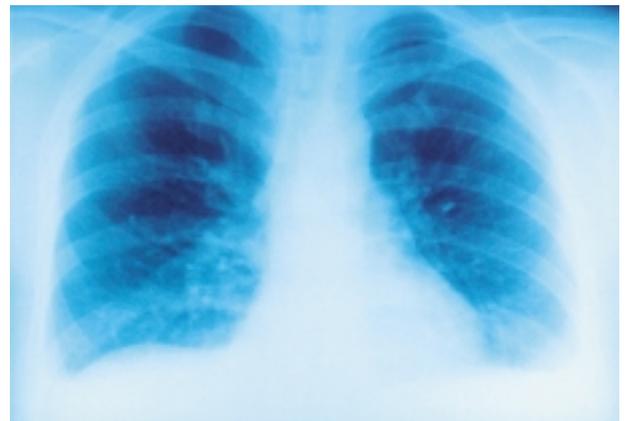


Fig. 2 Follow-up chest X-ray 6 weeks after the surgery showing mild elevation of the right diaphragm with minimal right-side pleural effusion.

patients with ascites and pleural effusions associated with benign ovarian fibromas, whose hydrothorax and ascites resolved after removal of the benign ovarian masses.⁽³⁾ Meigs' syndrome is more common in postmenopausal women with an average age of about 50 years. Although cases have been reported in children aged 4 and 9 years, it is extremely rare in women aged less than 30 years.^(4,5)

Several theories have been postulated to explain the origins of the ascitic and pleural fluids in Meigs' syndrome. Ascites probably occurs by means of a transudative mechanism through the tumor surface which exceeds the peritoneum's resorptive capacity.⁽⁶⁾ Meigs et al. explained that the pressure on the lymphatics in the tumor itself causes the escape of fluid through the surface lymphatics that are situated just beneath the single layered cuboidal epithelium covering the tumor.⁽⁷⁾ The pleural effusions are thought to arise through direct passage of ascitic fluid from developmental defects in the diaphragm, and the greater proportion of right pleural effusions in Meigs' syndrome is due to the greater frequency of such defects on the right side of the diaphragm.⁽⁷⁾ The idea of the free passage of fluid is further supported by the identical biochemical and cellular compositions of the pleural and peritoneal exudates and the rapid recurrence of pleural fluid following percutaneous drainage.⁽⁸⁾

Since 1989, 10 reports (15 cases) of Meigs' syndrome with elevated CA-125 levels were published.^(1,8-16) The serum CA-125 concentration may be moderately elevated in advanced endometrial and cervical adenocarcinomas and in a variety of benign conditions such as pelvic inflammatory disease, uterine fibroids, pregnancy, spontaneous abortion with chromosomal abnormality, Meigs' syndrome, and especially in endometriosis.⁽¹⁷⁾ Serum CA-125 levels are also increased with peritoneal, pleural, and pericardial inflammation or irritation, and there is evidence that peritoneal mesothelial cells are even more potent than ovarian cancer cells in producing CA-125.⁽¹⁸⁾

When considering possible explanations of the elevated serum CA-125 levels, 2 points should be kept in mind. The first is the rarity of Meigs' syndrome and that high CA-125 levels might be age-related (most of the cases reported were in their 70s); the second is the consideration of the presence of associated secondary pathologic structures (such as

adenomyosis, endometriosis, pelvic inflammatory disease, and leiomyomas) resulting in high CA-125 levels. The precise mechanism consists biochemical factors, mechanical factors, and dynamic changes within the peritoneal cavity. However, Vasilev et al.⁽²⁾ previously reported 2 ovarian fibromas with CA-125 levels of < 35 U/ml but there is no information on whether the condition was complicated with Meigs' syndrome. Our case showed a normal serum CA-125 level with the complication of Meigs' syndrome. Apart from the associated pathology of the pelvis and the age-related event, the interval between diagnosis of the diseases and surgery might also play a role in the mechanisms of developing elevated serum CA-125 levels. Therefore, early recognition of ovarian fibromas/thecomas complicated with Meigs' syndrome in our case could thus explain the unusual finding which differs from previous reports.

In patients with an unexplained pleural effusion or ascites, the responsible pelvic tumor is frequently overlooked. Prior to the report of Meigs, patients with similar clinical manifestations were thought to be inoperable due to the clinical pictures of a malignant ovarian tumor with pleural metastases and effusion. Therefore, in view of the case we report, Meigs' syndrome should be included in the differential diagnosis of young women presenting with pleural effusion.

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Meigs' 症候群併正常血清 CA-125 值

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27 歲女性病患，因為骨盆腔實質性卵巢腫瘤（20×15 公分）併大量腹腔積水而來求診，理學檢查及胸部 X 光檢查呈現右側胸腔積水。胸腔積水經細胞學檢查並無顯示惡性細胞併格蘭氏染色檢查為陰性結果。血液生化檢驗及腫瘤指數檢查（CA-125、AFP、CEA）均在正常範圍。開腹手術中發現左側卵巢實質性腫瘤（大小約 20×15 公分）合併 1500 cc 黃橙色腹水。腹水細胞學檢驗並未發現惡性細胞。手術後病患胸腔積水的情形自然消退併經病理切片確定為良性卵巢纖維瘤，這些條件都符合了 Meigs' 症候群的診斷標準，這是 Meigs' 症候群合併正常血清 CA-125 濃度的案例報告。（長庚醫誌 2005;28:587-91）

關鍵字：Meigs' 症候群，CA-125。

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