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Tubo-ovarian abscesses with elevated CA-125: A case report

Kwok Wan Yeung, Hsin Chih Chao

ABSTRACT

Introduction: The detection of pelvic masses with an elevated blood cancer antigen 125 (CA-125) level is highly suggestive of ovarian cancer. However, various benign and inflammatory gynecological conditions and non-gynecological processes, such as liver and pulmonary diseases, may be associated with an elevated serum CA-125 level, especially in premenopausal women.

Case Report: An 18-year-old female patient with lower abdominal pain for three days presented to our hospital. No fever was noted. Blood cancer antigen 125 (CA-125) level was elevated (660 U/mL; normal value, <35 U/mL), while the levels of other tumor markers (α-fetoprotein, carcinoembryonic antigen, β-human chorionic gonadotropin, and CA-199) were within normal limits. Transabdominal ultrasonography showed multicystic lesions with interior septation in the adnexal regions on both sides, suggesting the presence of cystic masses in both ovaries. Contrast-enhanced magnetic resonance imaging (MRI) revealed dilated and tubular structures with fluid-fluid level, wall thickening, and enhancement in the right pelvic cavity, and oval and septated masses with wall thickening and enhancement in both adnexal regions. A MRI diagnosis of right tubo-ovarian abscess and left ovarian abscess was made. Laparoscopy confirmed bilateral tubo-ovarian abscesses with pelvic adhesion. Right salpingectomy, left partial salpingectomy with end-to-end anastomosis, and adhesiolysis were performed. The patient was discharged with an uneventful course five days later. The blood CA-125 level dropped to 127 U/mL in 1 week, and to a normal value (6.5 U/mL) five months after surgery.

Conclusion: Using CA-125 in isolation has limited value in differentiating benign from malignant pelvic masses. CA-125 levels are elevated in ovarian malignancy, as well as in pelvic inflammation, especially in a young woman with a sexual history. Clinical history and radiological information from US, CT, MRI and PET/CT provide important additional information for the disease entity.

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Keywords: Tubo-ovarian abscesses, Elevated CA-125

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INTRODUCTION

The detection of pelvic masses with an elevated blood cancer antigen 125 (CA-125) level is highly suggestive of ovarian cancer [1, 2]. However, various benign and inflammatory gynecological conditions and non-gynecological processes, such as liver and pulmonary diseases, may be associated with an elevated serum CA-125 level, especially in premenopausal women [2]. Using CA-125 measurements alone has limited value in differentiating benign from malignant pelvic masses [1]. Clinical history and radiological information (US, computed tomography [CT], MRI, combined positron emission tomography [PET] and CT) provide important additional information for the disease entity. Here we present a case of tubo-ovarian abscesses with elevated CA-125 level, which decreased to a normal value within five months of surgery.

CASE REPORT

The patient was an 18-year-old girl who had been experiencing lower abdominal pain for three days. No fever was noted. Blood CA-125 level was elevated (660 U/mL; normal value, < 35 U/mL), while the white blood cell count (6920/μL) and the levels of other tumor markers (α-fetoprotein, 0.67 ng/mL; carcinoembryonic antigen, 0.9 ng/mL; β-human chorionic gonadotropin, <1.2 mIU/mL; CA-199, 4.55 U/mL) were within normal limits. Routine urine examination also yielded normal results. Transabdominal US showed multicystic lesions with diameters of up to 6 cm and with interior septation in the adnexal regions on both sides, suggesting cystic masses in both ovaries. Magnetic resonance imaging (MRI) with contrast administration (gadoteric acid, Gd-DOTA) revealed dilated and tubular structures with fluid-fluid level, wall thickening, and enhancement in the right pelvic cavity (Figure 1). Oval and septated masses with wall thickening and enhancement were demonstrated in the adnexal regions, with the right and left adnexal masses having diameters of 3.2 cm and 2.8 cm, respectively. Ascites in the pelvic cavity and an enlarged lymph node in the right perirectal space were also found. A provisional MRI diagnosis of right tubo-ovarian abscess and left ovarian abscess was made.

Laparoscopy confirmed bilateral tubo-ovarian abscesses with pelvic adhesion (Figure 2). Right salpingectomy, left partial salpingectomy with end-to-end anastomosis, and adhesiolysis were performed. The patient was discharged after five days with an uneventful course. Blood CA-125 level dropped to 127 U/mL in 1 week, and returned to normal value (6.5 U/mL) after five months of surgery.

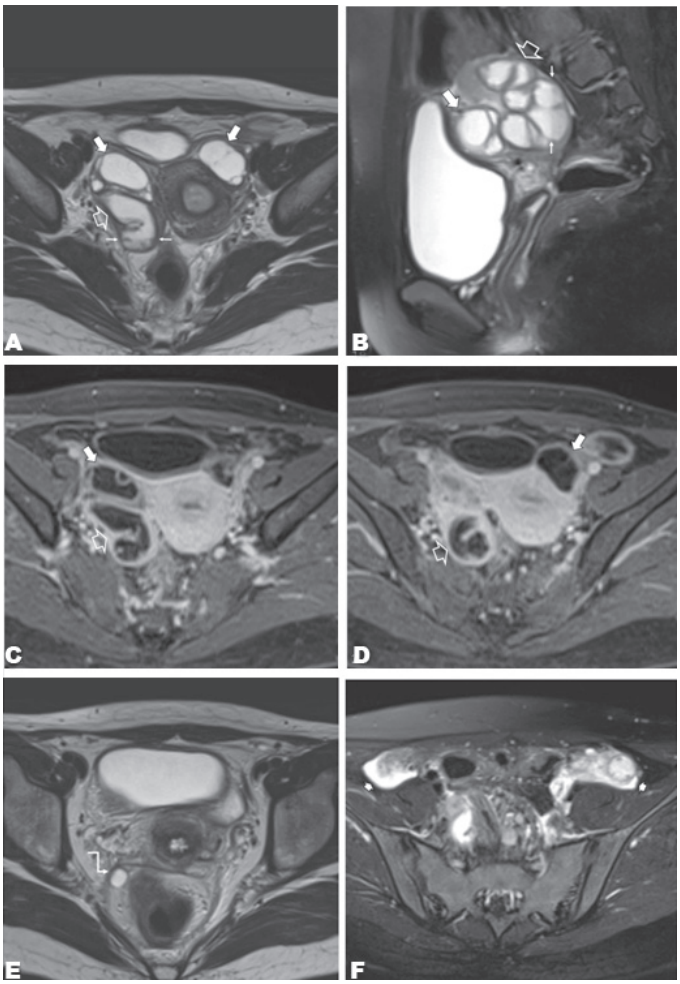

Figure 1: MRI findings. (A) T2-weighted axial image, (B) T2-weighted sagittal image with fat saturation, (C, D) Gd-DOTA contrast-enhanced axial images with fat saturation, with (D) being 9 mm higher than (C), (E) T2-weighted axial image 2 cm lower than (A), and (F) T2-weighted axial image with fat saturation.
Oval and septated masses are noted in bilateral adnexal regions (thick arrows in A and B), showing T1-weighted hypointensity (not shown) and T2-weighted hyperintensity. Dilated and tubular structures are seen in the right pelvic cavity (A and B, open arrows), with interior fluid-fluid level (A and B, between thin arrows). The adnexal masses (thick arrows) and the dilated, tubular structures (open arrows) reveal wall thickening and enhancement (C and D). These findings are consistent with right tubo-ovarian abscess and left ovarian abscess. A 1.1-cm, round, T2-weighted hyperintense lymph node is found in the right perirectal space (S-shaped arrow in E). Ascites is also seen in the peritoneal cavity (F, small arrow).

DISCUSSION

A CA-125 level less than 35 U/mL is generally considered normal [1]. A pelvic mass with an elevated CA-125 level is highly suggestive of ovarian cancer [1, 2]; the CA-125 level is elevated in 80% of malignant ovarian tumors of non-mucinous type. However, an elevated serum CA-125 level may be found in many other benign

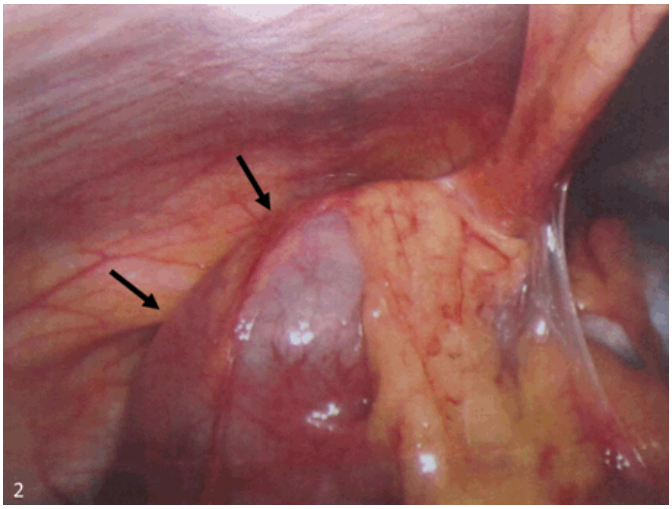

Figure 2: Enlargement and congestion of the left ovary are seen on laparoscopy, consistent with left ovarian abscess. The right ovary (not shown) showing a similar appearance.

pelvic diseases, especially in young patients with a sexual history and in premenopausal women.

CA-125 is widely distributed on the surface of both healthy and malignant cells of mesothelial origin, including pleural, pericardial, peritoneal and endometrial cells, as well as the fallopian tubes and amniotic membrane [2]. It has been shown to be a relatively specific marker for ovarian cancer. The CA-125 molecule is absent on the surface of normal ovarian cells, but is present in 80% of malignant ovarian cancer cells of non-mucinous origin [2]. It is a 200-kDa glycoprotein, and was initially identified on the surface of the ovarian carcinoma cell line OVCA433. Elevated CA-125 may be found in various benign and inflammatory gynecological conditions other than ovarian cancer, including menstruation, pregnancy, endometriosis, ovarian cysts, pelvic inflammatory disease, inflammation of omentum secondary to the ruptured dermoid cyst of ovary, and also in non-gynecological diseases including peritonitis, liver and pulmonary diseases [1, 2].

Transabdominal and transvaginal US is widely used and is the first diagnostic modality for investigation of pelvic masses [2, 3]. US is readily available, and transvaginal US has a high negative predictive value for assessment of ovarian tumors [3]. However, MRI had been shown to be superior to US and CT in depicting pelvic pathologies [4–7], with the overall accuracies of MRI, US and CT being 97%, 77% and 87%, respectively [6]. Combined PET and CT also have a high diagnostic value in depicting primary ovarian malignancy due to its high sensitivity and specificity (100% and 92.5%, respectively) [8].

The sonographic features of tubo-ovarian abscess (TOA) include a solid, cystic or complex mass in the adnexal region or cul-de-sac with adjacent fluid accumulation [9]. The mass may have a thick wall and interior echoes representing pus or debris [10]. Indistinct uterine margin and loss of interior endometrial echoes may be observed. These findings are nonspecific and may overlap with those of endometriosis, hemorrhagic cysts, dermoid cysts, or other cystic ovarian tumors. A diagnosis of TOA is difficult by sonography alone without clinical information of the inflammatory symptoms and signs. Clinical and laboratory findings may therefore play a key role in diagnosis. Moreover, about 20% of patients with TOA are afebrile or have a normal white blood cell count [9].

Computed tomography scan is not indicated for differential diagnosis of adnexal masses due to poor soft tissue discrimination [7], but it can depict fatty and calcified components, is superior in detecting omental infiltration [6], and helps assess the extent of disease before and after cytoreductive surgery, and following chemotherapy to detect residual and recurrent tumors [2, 3]. The CT findings of TOA consist of a pelvic mass with uniform and thick wall and internal septations [9]. Fluid-filled tubular structures with thick and enhancing wall are indicative of pyosalpinx. The rectosigmoid colon and ureter may be involved by TOA. However, radiation is one disadvantage of CT in the evaluation of pelvic masses.

MRI is superior to transvaginal US in assessing pelvic inflammatory disease [4, 5]. MRI has a higher sensitivity, specificity and accuracy, compared with those of transvaginal US (95%, 89% and 93%, versus 81%, 78% and 80%, respectively) [5], and has better soft tissue resolution and multiplanar capability [6]. On MRI, both hydrosalpinx and pyosalpinx have dilated, fluid-filled and tubular structures, and cannot be reliably differentiated using MRI. In pyosalpinx, the wall of the fallopian tube may be thickened, and the content may have variable signal intensity on T1-weighted images, and heterogeneous signal intensity on T2-weighted images. A tubo-ovarian abscess appears as a multiloculated cystic structure, or an ill-defined and heterogeneous mass with interior cystic and solid components. The wall of the abscess and adjacent inflammatory process may enhance after administration of the gadolinium-based contrast medium. The tubo-ovarian abscess and ovarian cancer are difficult to differentiate in the presence of ascites and lymphadenopathy. However, tubal dilatation is not usually found in ovarian malignancy [4]. Therefore, the presence of hydrosalpinx can differentiate the two conditions, as shown in our case.

Monitoring the levels of CA-125 can help determine the condition of the pelvic disease [2]. A reduction in CA-125 levels between serial measurements suggests that the elevation at the beginning of the disease process may be of benign origin. This is in contrast to the exponential rise in CA-125 levels found in ovarian malignancy.

CONCLUSION

Using CA-125 in isolation has limited value in differentiating benign from malignant pelvic masses. CA-125 levels are elevated in ovarian malignancy, as well as in pelvic inflammation, especially in a young woman with a sexual history. The incidence of ovarian cancer is low in young women, and epithelial ovarian cancers do not occur before menarche. Clinical history and radiological information from US, CT, MRI and PET/CT provide important additional information for the disease entity.

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Author Contributions

Kwok Wan Yeung – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Hsin Chih Chao – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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