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Research Letter

# Dramatic changes of CA 125 levels in a pregnant woman with a degenerated subserosal myoma

Fu-Nan Cho*, Cheng-Bin Liu, Ju-Yueh Li, San-Nung Chen, Ken-Jen Yu

*Department of Obstetrics and Gynecology, Kaohsiung Veterans General Hospital, Kaohsiung, Taiwan*

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A 28-year-old pregnant woman presented with a pelvic mass that was causing no discomfort. Gray-scale transvaginal sonography revealed a 6-week intrauterine gestation, a 6-cm, irregular, left-sided adnexal tumor, and a blurred interface between the tumor and the uterus. Her serum cancer antigen (CA) 125 level (Architect CA 125 II, CMIA, Abbott Laboratories, Abbott Park, IL, USA) was 1007 U/mL, but the levels of carcinoembryonic antigen (CEA), carbohydrate antigen (CA) 199, and lactate dehydrogenase (LDH) were within normal ranges.

On color mapping analysis, no central vascularity presented in the mass, but tumor-feeding vessels from the uterus were clear (Fig. 1A and 1B), thus leading to a diagnosis of subserosal myoma. The Doppler waveform of one tumor-feeding artery revealed a resistance index of 0.65 and a peak systolic velocity of 40 cm/s. The mass grew continuously, up to 8 cm × 8 cm × 9 cm in the third trimester. The CA 125 level was 421 U/mL at 7 weeks' gestation and then quickly decreased to 66 U/mL at the end of the first trimester, before further gradually falling to 44 U/mL at term.

During cesarean section for a breech presentation, endometriosis was not detected but an irregular reddish-white subserosal myoma was noted and excised. This measured approximately 9 cm × 9cm × 8 cm and was connected to the left upper anterior uterine wall via a 4 cm × 2 cm stalk (Fig. 2). Microscopic examination confirmed a myoma with hyaline degeneration and hyaline necrosis.

Most patients with a subserosal myoma of the uterus are asymptomatic, meaning that it often grows into a large pelvic mass. In clinical practice, it is possible to misdiagnose a complex degenerated subserosal myoma as an ovarian tumor on the basis of gray-scale ultrasound findings [1], especially with a very high CA 125 level. An erroneous diagnosis always results in an excessive emotional burden on the patient, a waste of medical resources in terms of advanced imaging studies, and a precipitate operation possibly conducted during pregnancy.

CA 125 is expressed by amniotic, coelomic, and müllerian epithelia and is a marker for epithelial ovarian cancer, carcinoma of the fallopian tube, and endometrial carcinoma. When CA 125 is used to screen for ovarian cancer, an abnormal level (> 35 U/mL) is observed in only 50% of patients with stage I disease, and a higher value carries a better positive predictive rate [2]. A high CA 125 level is also likely to be associated with endometriosis, adenomyosis, pelvic inflammatory disease, pleural effusion, menstrual period, pregnancy, threatened abortion, and myoma [2–7].

According to a recent review, the association of elevated CA125 with myoma is inconsistent, and the rise of CA125 is usually small [4]. In addition, there are only rare reports of a high CA 125 level (>1000 U/mL) being detected in patients with myoma [4]. In the report by Ghaemmaghami et al, one patient (46 years of age) had an intramural myoma (7 cm × 5 cm in size) and the other (16 years old) presented with multiple myomas together with a significant rise in CA 125 level measured during the menstrual period. In theory, peritoneal irritation is likely provoked by a degenerated subserosal myoma. However, the evidence in literature regarding the association of a degenerated subserosal myoma with a very high CA 125 level remains lacking.

In normal pregnancy, the CA 125 serum level increases [3,5],up to 60%, during the first trimester, and then falls until term [3].The higher CA 125 levels in early pregnancy are possibly related to the process of trophoblast invasion of the decidua during implantation [5]. However, a CA125 level above 1000 U/mL in early pregnancy has not been reported. The synergic effects of trophoblastic invasion and the degeneration of a subserosal myoma may in part explain our patient's very high CA 125 level in early pregnancy.

* Corresponding author. Department of Obstetrics and Gynecology, Kaohsiung Veterans General Hospital, 386 Ta-Chung 1st Road, Kaohsiung 81362, Taiwan.

*E-mail address:* fncho@isca.vghks.gov.tw (F.-N. Cho).

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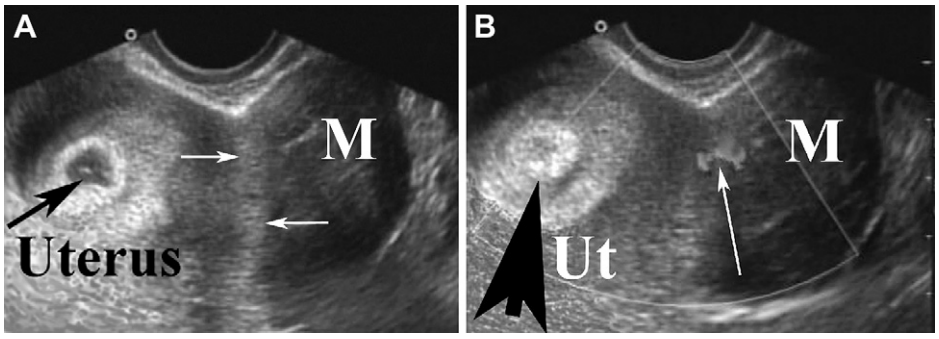


Fig. 1. A pregnant woman, at 6 weeks' gestation, presented with a CA 125 level of 1007 U/mL and a left pelvic mass. (A) Transverse view during transvaginal sonography shows an intrauterine gestation (black arrow) and a blurred interface (white arrows) between the mass (M) and the uterus. (B) On color mapping, identification of a connecting vessel (white arrow) between the mass (M) and the uterus (Ut), containing a gestational sac (black arrow), helps make a diagnosis of subserosal myoma.

Maternal serum levels of CA 199 and CEA are not significantly affected during pregnancy and remain as reliable tumor markers in pregnancy [3]. CEA is associated with mucinous ovarian carcinoma. A high CA 199 value is observed in patients with gastrointestinal cancer, ovarian adenocarcinoma, endometriosis, and dermoid cyst [8]. This case report indicates that a very high serum CA 125 level, i.e. >1000 U/mL, detected in early pregnancy may be associated with a degenerated subserosal myoma, and sequential CA 125 levels could fall significantly in the first trimester.

On gray-scale sonography, it may be difficult to identify or confirm the connecting stalk of a large pedunculated subserosal myoma. However, the identification of tumor-feeding vessels from the uterus by color Doppler analysis certainly plays a valuable role in differentiating a subserosal myoma from an ovarian tumor, thus preventing an unnecessary laparotomy during early pregnancy. Further, an attempt to identify bilateral normal ovaries is an alternative to exclude an ovarian origin for the mass. Occasionally, bilateral ovaries may be difficult to detect by sonography when they are displaced by a huge tumor. The incidence of malignant change in a uterine myoma is low, up to 0.27% [9].

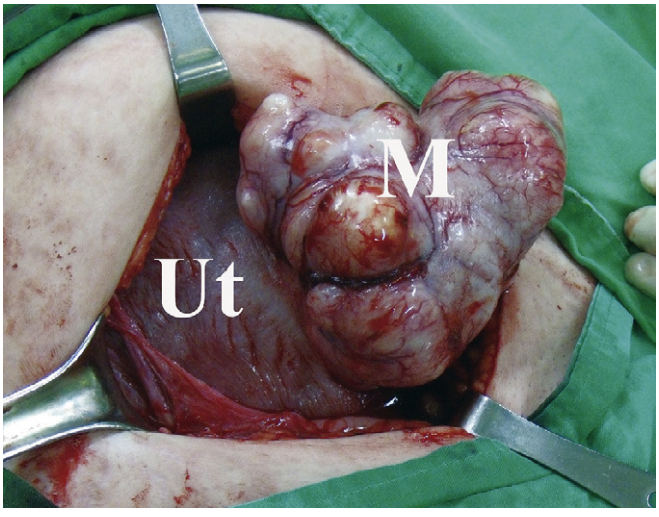


Fig. 2. An irregular degenerated subserosal myoma (M) of the uterus (Ut) was shown during cesarean section after closure of the uterine incision.

In dealing with a complex degenerated myoma, malignancy should be considered before any decision regarding surgery is made. The presence of central hypervascularity, a high peak systolic velocity, or a low resistance index of tumor vessels on Doppler analysis, and a high LDH serum value have been collectively linked to a suspicion of uterine malignancy [10,11].

In conclusion, a very high CA 125 level in early pregnancy may be associated with a degenerated subserosal myoma. Subsequent CA 125 levels obtained after first trimester together with color Doppler sonography may be helpful in determining the origin of a pelvic mass in pregnancy.

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