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Case Report
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Case Report: Elevated Tumor Markers in Ovarian Low Malignant Potential Tumors

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Abstract

Objective: Ovarian cancer represents the second most common gynecologic malignancy after endometrial cancer and carries the highest mortality of all female cancers at fifty percent. With no adequate early-detection screening options to identify ovarian cancer in patients, research is ongoing. Screening modalities in addition to history and physical examination currently include imaging, usually with vaginal sonography, and tumor markers, serum proteins and biomarkers used for screening, diagnosis, prognosis and monitoring effectiveness of treatment.

Methods: We report a case of an intestinal-type mucinous borderline ovarian tumor, showing as a heterogeneous complex cystic mass with curvilinear anechoic and echogenic areas on transvaginal sonogram, with an abnormally elevated serum Carcinoembryonic Antigen (CEA) level.

Results: In this case, transvaginal ultrasound was able to accurately show the components of the tumor. Additional diagnostic imaging and colonoscopy in the setting of elevated tumor markers confirmed the absence of associated malignancy. The ovarian tumor was successfully removed surgically laparoscopically with fertility sparing unilateral adnexectomy.

Conclusion: Literature review indicates clinical benefit of CEA among other ovarian tumor markers in determining the presence and type of tubo-ovarian malignancy prior to recommended surgical intervention.

Keywords: Ovarian neoplasms; Carcinoma; Ovarian epithelial; Biomarkers; Tumor; CA-125 Antigen; Carcinoembryonic antigen

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Introduction

Ovarian cancer is responsible for more cancer deaths that any other gynecologic cancer. The lifetime risk without genetic predisposition of developing tubo-ovarian cancer is 1 in 70 [1]. Of these tubo-ovarian cancers, 5% to 15% is borderline ovarian tumors [1]. The term "borderline ovarian tumor" is defined as "low malignant potential" by the International Federation of Gynecology and Obstetrics (IFGO) and the terms are used interchangeably [1]. Mucinous borderline tumors make up about 38% of borderline tumors, 85% of which are reported to be intestinal-type mucinous borderline tumors [1]. These tumors are mostly found in women in their 40s to 70s [2]. It is estimated that 80% to 90% of these tumors are stage I at diagnosis [2-4]. These tumors often present with a palpable mass, abdominal pain, bloating, abdominal distension, early satiety, etc. The case presented here is of a 45-year-old woman with a symptomatic right ovarian cyst that pathologically revealed a borderline mucinous ovarian tumor of the intestinal type. The patient ultimately underwent fertility-sparing removal of the involved adnexa.

Case Presentation

A 45-year-old nulligravid woman presented to the gynecology-oncologist for reassessment of a known ovarian cyst and new pelvic pressure. Her gynecologist had identified the cyst on routine sonogram eight years prior to consultation and provided surveillance with serial sonograms as she remained asymptomatic. MRI performed at initial consultation one year previously confirmed a 6 cm × 5.2 cm × 5.8 cm right ovarian complex cystic lesion containing fat consistent with dermoid, and a 2.3 cm cyst consistent with endometrioma abutting the dermoid. The patient reported worsening pelvic pressure for several weeks and her examination confirmed increased size of the right pelvic mass. Subsequent transvaginal sonogram confirmed a 9.4 cm × 11.0 cm × 12.3 cm right ovarian heterogeneous complex cystic mass with curvilinear anechoic and echogenic areas with normal

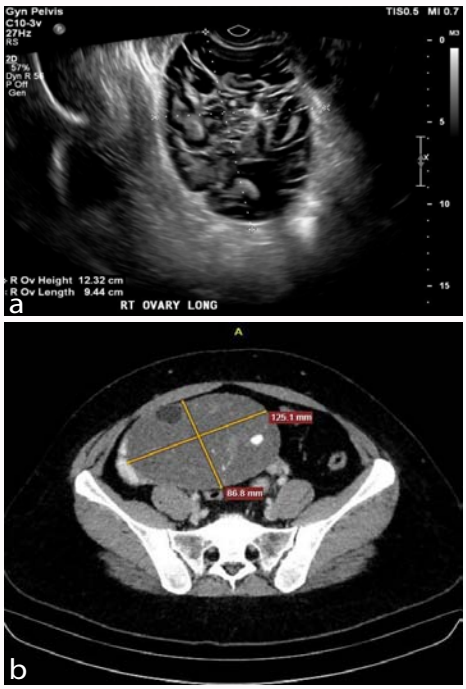

Figure 1: Preoperative imaging of right adnexal mass. a) Transvaginal ultrasound of right ovary showing heterogeneous complex cystic mass with curvilinear anechoic and echogenic areas. b) CT image of enlarged right ovarian mass.

blood flow but not consistent with teratoma or endometrioma as had been suggested by the previous MRI (Figure 1). Serum tumor markers were obtained and serum levels of Carcinoembryonic Antigen (CEA) and Cancer Antigen 125 (CA-125) were elevated at 16 ng/ml and 50 U/ml, using cut-off values 0.0 to 3.0, and <35, respectively. Computed Tomography (CT) of the abdomen and pelvis were obtained, as well an upper gastrointestinal endoscopy and colonoscopy (Figure 1). CT, endoscopy, and colonoscopy results were showed no evidence of gastrointestinal tumor.

The patient expressed her desire to maintain fertility and underwent a laparoscopic right salpingo-oophorectomy. Intraoperatively, there was no evidence of metastatic ovarian cancer. The cyst contents were noted to be fatty and gelatinous. Her postoperative recovery was uneventful.

Results

The final pathology confirmed mucinous borderline tumor of the right ovary, intestinal type limited to the ovary with components of endometriosis and mature cystic teratoma (Figure 2). Her exam was normal at follow evaluation and repeat serum CEA decreased to a normal level of 1.9 ng/ml.

Discussion

Adnexal masses are one of the most common gynecologic diagnoses. Patients may present with an incidental mass on exam or with complaints of abdominal pain, bloating, abdominal distension, early satiety, etc. Imaging is a necessary component for evaluation of an adnexal mass and should start with transvaginal sonography. In the presence of an enlarged adnexal mass, tumor markers are often helpful in determining risk of malignancy and can be useful for monitoring effectiveness of treatment. Ovarian cancer commonly eludes early detection as no adequate screening test is available. A borderline ovarian mass is typically asymptomatic, however, if symptomatic, will normally present with complaints similar to other benign adnexal masses and should be evaluated in the same manner.

Diagnosis of borderline ovarian tumors is based on histology after surgical removal of the mass. According to the World Health Organization, diagnostic criteria for intestinal mucinous borderline ovarian tumors include: Gastrointestinal-type mucinous epithelial-lined walls in the cyst forming some papillae at least supported minimally by stroma, slightly larger nuclei than seen in cystadenomas, mitotic cells, Paneth cells, and no stromal invasion [5,6]. Recommended staging is the same as for other tubo-ovarian cancers but in the case of borderline ovarian tumors the long-term prognosis is excellent and is rarely impacted by additional surgical staging. This begs the question: Can these low malignant potential tumors be identified by tumor marker screening and do tumors markers associated with low malignant potential tumors have any role in or prognosis?

The most useful tumor marker for identifying mucinous ovarian tumors is CEA. In studies regarding the use of CA 19-9, Ca-125, and CEA in differentiating ovarian tumors, CEA was elevated in the majority of all mucinous tumors but not in serous tumors, while CA 19-9 was more common with serous borderline tumors [7]. In one study the sensitivity of CA-125 with 35 U/ml as the cutoff was 88% in women with ovarian carcinoma, but 74% among those with limited disease and 58% in borderline malignancy [8]. Only 6 of 17 (35%) mucinous ovarian carcinomas were detected by tumor marker results [8]. However, there have been inconsistent results for differentiating mucinous tumors as malignant or borderline based on CEA level [7,8]. Observing that CEA levels appear higher in mucinous histological types, but less helpful in distinguishing benign masses, borderline tumors or malignancy [7-9]. Several studies suggest a positive correlation of increased levels of serum CEA with both increasing stage and increasing size of the primary tumor for mucinous tumors [10-12].

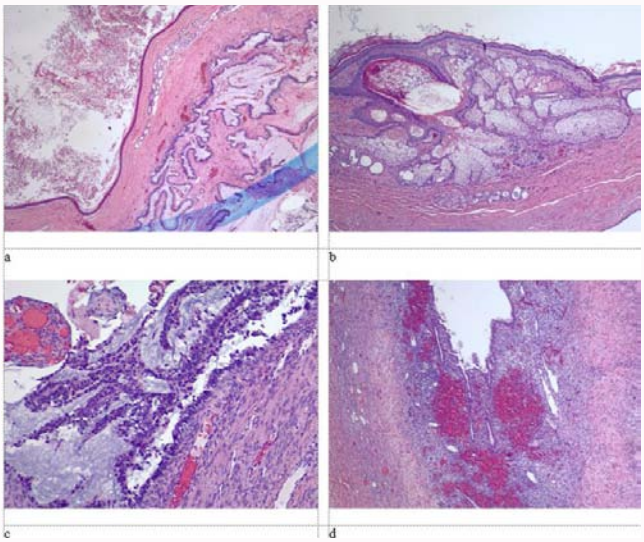

Figure 2: Histology of surgically removed right adnexa. a) Microscopic view of teratoma and borderline mucinous tumor of ovary (40x). b) Microscopic view of teratoma component, cutaneous tissue with appendages, sebaceous glands (100x). c) Microscopic view of borderline mucinous tumor showing columnar epithelium with mucin pool (200x). d) Microscopic view of endometriosis in the background of fibrotic ovarian stroma, hemorrhage, endometrial type small glands embedded in endometrial stroma (200x).

In the management of ovarian cancer, acceptable primary therapy may be optimal surgical debulking surgery or neoadjuvant chemotherapy [1]. Surgery usually includes exploratory laparotomy, abdominal cytology, hysterectomy, BSO, omentectomy, and optimal cytoreduction. In cases of cystectomy for borderline tumors, incidence of recurrence is 23% and for USO, recurrence is 8% with time to recurrence 2.6 and 4.7 years respectively [1]. If staging is not performed or an ovarian borderline tumor is an incidental finding at the time of surgery for other indications, no data suggests that repeat surgical intervention for staging alone is clinically beneficial. Fertility-sparing surgery is the most desired approach in women of reproductive age although a 16% to 23% recurrence rate in the contralateral retained ovary has been observed [1].

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