Ovarian carcinoma initially presenting as breast cancer two years prior to diagnosis: A case report and review of literature

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1. Introduction

More than 70% of cases of ovarian cancer are diagnosed as stage III and IV at presentation given the vague symptoms and lack of a good screening technique (American Cancer Society). Even at an advanced stage, a majority of metastatic disease is confined within the abdominal cavity. Ovarian cancer metastasizing to the breast is rare; a study of more than 4000 breast cancer patients found that only 0.07% had disease originating from the ovary (Hadju and Urban, 1972). While there have been approximately forty cases of ovarian cancer metastatic to the breast since its first reporting in 1907, cases where metastatic breast disease was diagnosed first are rarer still (Klein et al., 2010). We report a patient diagnosed and treated for breast cancer subsequently determined to be an ovarian primary.

2. Case report

This was a 61 year old patient with a past medical history significant only for hypertension who was found to have a left breast mass concerning for malignancy on screening mammogram in May 2012. She was referred to surgical oncology after an ultrasound-guided biopsy was diagnosed as invasive ductal carcinoma. In August 2012, she underwent a modified left mastectomy and axillary node dissection. Pathology demonstrated a high-grade papillary carcinoma and stained positive for PAX 8 and p53; the tumor did not stain positive for GCDFP 15 and mammoglobin (Images 1 and 2). Of note, the tumor was estrogen receptor positive and progesterone and her-2/neu receptor negative. Given concern for a possible metastatic ovarian or peritoneal serous carcinoma, she had a PET-CT which did not demonstrate any FDG-avid foci within the abdomen or pelvis and adnexa were noted to be within normal limits. CA-125 was 8.2. She was referred to gynecologic oncology for discussion of possible diagnostic laparoscopy versus hysterectomy and bilateral salpingo-oophrectomy however, the patient declined intervention at that time. She underwent adjuvant chemotherapy (four cycles of doxorubicin and cyclophosphamide followed by two cycles of paclitaxel) and chest wall radiation with completion in July 2013 and was then placed on anastrozole after.

She followed at regular intervals with her medical oncologist. Notes indicate that from July 2013 until April of 2015 she was in her usual state of health and her physical exam was within normal limits. On April 10, 2015, she presented for follow-up with oncology and complained of copious discharge from her naval as well as abdominal fullness. A CT abdomen/pelvis scan demonstrated ascites, omental caking, concern for a Saint Mary Joseph nodule in the umbilicus, and soft tissue mass of the right adnexa measuring 1.6 × 3.4 cm. CA-125 was 384.0. She underwent a FNA of the umbilical nodule and paracentesis with cytology showing papillary serous adenocarcinoma of Muellerian origin. Of note, the specimen was GATA 3 negative (Image 3). She was referred to a gynecologic oncologist and ultimately had a debulking procedure with residual disease less than ten millimeters at the completion of surgery. Final pathology was compared with the slides from the breast excision and demonstrated similar cytomorphologic features (Image 4).

3. Literature review and discussion

To our knowledge, there are forty reported cases of ovarian cancer metastasizing to the breast (Klein et al., 2010). It has been noted that in these cases, breast metastases present on average two years after initial diagnosis with ovarian cancer (Ozguroglu et al., 1999). In contrast, our patient presented with breast cancer more than two and a half years prior to developing symptoms secondary to ovarian cancer. A search of the English literature has yielded only one such similar case, where a patient presented first with breast and axillary disease (Hockstein et al., 1996). While the patient from that case did not have abdominal symptoms at presentation, work-up found a 6 cm adnexal mass and elevated CA-125, and thus the patient underwent a staging...
surgery for ovarian cancer at that time. In explaining the delay in symptoms and diagnosis of the underlying ovarian cancer in our patient, we hypothesize that the chemotherapeutics used to treat her breast cancer (known to be efficacious against Muellerian tumors) may have actually treated her primary disease site.

From the previously described cases, it is known that the most common histologic variant of ovarian cancer associated with metastatic disease to the breast is papillary serous adenocarcinoma (Moore et al., 1998). As almost 30% of breast cancers metastasize to the ovaries, immunohistochemical markers such as GATA 3, GCDFP-15, mammoglobin, and PAX8 can be used to differentiate primary ovarian versus metastatic breast disease; GATA 3 is currently the most sensitive marker for primary breast cancer (Sangoi et al., 2015). PAX8 stains tumors of gynecologic origin only and should be negative for disease with origin in the breast (Hockstein et al., 1996).

The primary mode of dissemination in ovarian cancer is through direct exfoliation of malignant cells within the peritoneal cavity. The second most common mode of metastatic spread is through lymphatic channels. Hematogenous spread is the least common mode and only present in 2–3% of patients; the disease sites associated with this route are most commonly the lung, pericardium, CNS, and bones (Berek and Hacker, 2015). Certainly, it is this hematogenous spread of ovarian cancer, which would appear to explain distant breast disease.

Metastatic ovarian cancer with distant disease sites at the breast is rare with few cases reported in the literature. This patient was first diagnosed with a breast cancer two and a half years before symptoms or radiologic findings of ovarian cancer were noted, making this an extremely rare presentation. We believe adjuvant chemotherapy used to treat her breast disease may have treated underlying ovarian cancer and delayed the presentation.

Conflicts of interest statement

The authors declare that there are no conflicts of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.gore.2015.12.005.

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