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### Metastatic Endometrial Serous Carcinoma to the Breast

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## Case Report

A 74-year-old postmenopausal female presents with several months of vaginal bleeding. Endometrial curettage and subsequent histopathology arrived at the diagnosis of endometrial serous carcinoma.

Shortly after, the patient developed a lump in her right breast. Mammogram and targeted ultrasound of the palpable area demonstrated a suspicious mass that was subsequently biopsied under ultrasound guidance. Histopathology revealed metastatic endometrial serous carcinoma.

## Discussion

Endometrial carcinoma is a common gynecologic malignancy that typically affects postmenopausal women during their 6<sup>th</sup> or 7<sup>th</sup> decade of life. Clinical presentation of endometrial cancer may consist of abnormal vaginal bleeding, pelvic pain, and involuntary weight loss. Subtypes of endometrial cancer include the more common type I, endometrioid adenocarcinoma, and the rarer type II, which encompasses clear-cell, carcinosarcoma, and endometrial serous carcinoma.<sup>1</sup> All type II endometrial cancers are high-grade tumors. Definitive diagnosis involves dilatation and curettage or endometrial biopsy.

## Discussion, cont.

Endometrial carcinoma may spread locally by direct infiltration as well as systemically via lymphatic or hematogenous routes. Endometrial cancer staging utilizes surgicopathologic findings from exploratory laparotomy, abdominal hysterectomy, bilateral salpingo-oophorectomy, peritoneal lavage, and pelvic and para-aortic lymphadenectomy.<sup>1</sup> Preoperative imaging using transvaginal ultrasonography, computed tomography, magnetic resonance imaging, and more recently, positron emission tomography, offer the benefit of identifying distal metastases. Typical metastatic sites include local pelvic recurrence, abdominal lymph nodes, peritoneum, and lungs.<sup>2</sup> Rare metastatic targets include extra-abdominal lymph nodes, liver, adrenal glands, brain, bones, and soft tissues.

The breast is a rare target for extramammary metastases, with the most common primary tumors being melanoma, leukemias, or lymphomas.<sup>3</sup> Endometrial metastases to the breast are even more rare. To our best knowledge, there is only one other documented account of metastatic endometrial serous carcinoma to the breast.<sup>4</sup> Rates of clinically observed extramammary metastases to the breast range from 0.5 to 1.3%<sup>5</sup>; however, this frequency is low compared to autopsy studies that report 6.6% of breast tumors to be non-primary.<sup>6</sup> Discrepancy in the aforementioned findings could indicate that metastases to the breast may occur later during advanced malignant disease or with rare high-grade tumors such as type II endometrial cancer.

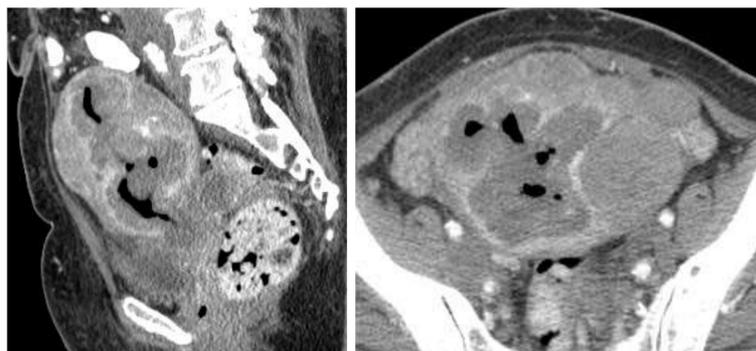
## Discussion, cont.

Metastatic disease to the breast may mimic primary breast cancer on imaging studies. Sonographically, extramammary metastases may appear differently when the cancer seeds the breast through hematogenous versus lymphatic routes.<sup>7</sup> Hematogenous metastases tend to colonize richly vascularized areas of the breast. Typical ultrasonographic findings includes single or multiple circumscribed hypoechoic oval masses involving only one breast. Features common to primary breast cancer such as spiculations, calcification, parenchymal distortion, acoustic shadowing, and secondary skin or nipple changes are typically not observed with hematogenous metastases to the breast. Sonographic appearance of lymphatic metastases may mimic inflammatory primary breast cancer by demonstrating heterogeneous echogenicity, coarse trabecular pattern, skin thickening, and lymphedema. On mammography, the morphology of metastases to the breast is that of an oval circumscribed mass with no associated microcalcifications and no desmoplastic features.

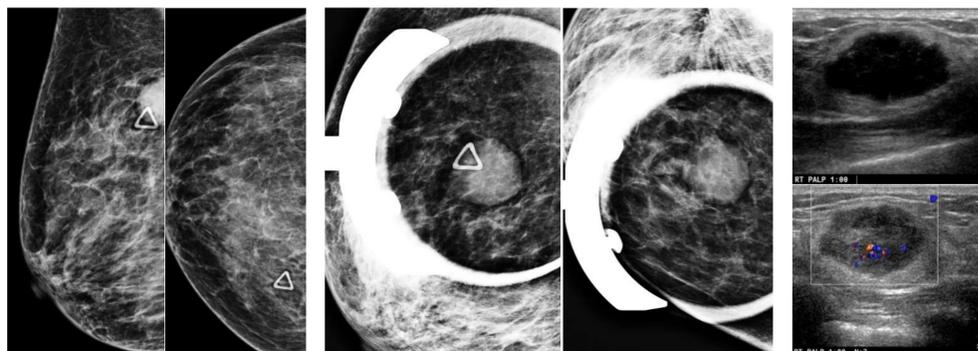
Diagnosis of metastases to the breast can be confirmed using comparative histopathology of the mammary lesion and the primary cancer. For primary endometrial serous carcinoma, common histological features from the endometrial biopsy include papillae containing high pleomorphic tumor cells with glandular structure.<sup>8</sup> Myometrial invasion with high mitotic activity are also frequently observed due to the cancer's aggressive nature. Psammoma bodies may be present, but they are not distinguishing features of endometrial serous carcinoma.

In this case study, histology of the endometrial curettage revealed pleomorphic glandular tumor cells consistent with endometrial serous carcinoma. Furthermore, ultrasound-guided core needle biopsy of the breast mass demonstrated tumor cells that were morphologically and architecturally similar to the endometrial curettage samples. Subsequent staining for breast carcinoma marker mammaglobin was negative and evidence of ductal carcinoma in situ was absent. All the evidences considered, the diagnosis for the suspicious breast lesion argued against primary breast carcinoma, but instead were more consistent with metastatic endometrial serous carcinoma to the breast.

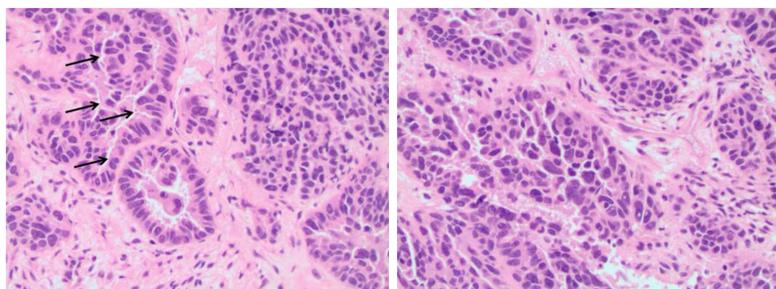
## Imaging



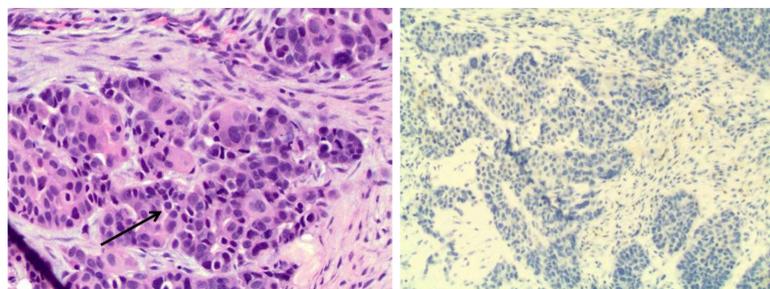
Sagittal (left) and axial (right) CT images of the abdomen and pelvis demonstrate a markedly enlarged and heterogeneous uterus with a heterogeneously thickened endometrium with areas of enhancement and necrosis.



Mediolateral oblique and craniocaudal mammographic images of the right breast (left) as well as spot compression images (middle) demonstrate a 25 mm mass in the upper inner quadrant posteriorly corresponding with the patient's palpable lump. Targeted ultrasound (right) demonstrates a hypervascular solid mass corresponding with the mammographic findings.



Hematoxylin and eosin (H&E) stain from endometrial curettage demonstrates serous endometrial carcinoma with disorganized solid and glandular architecture as well as high-grade nuclei with diffuse, marked nuclear pleomorphism with stromal invasion. Arrows point to slit-like lumina characteristic of endometrial serous carcinoma.



H&E stain (left) demonstrates poorly differentiated malignant tumor cells that are morphologically and architecturally similar to the tumor cells in the endometrial curettage. Slit-like lumina are again seen that distinguish it from the round lumina of breast ductal carcinoma. Immunophenotypic stain for breast carcinoma marker mammaglobin (right) is negative for ductal carcinoma, further supporting the diagnosis of metastatic endometrial serous carcinoma.

## Conclusion

Metastatic disease to the breast is an uncommon but not rare occurrence. Melanomas and hematopoietic malignancies that infiltrated the breast are well documented by several investigators. Conversely, metastatic endometrial serous carcinoma to the breast, as presented in this case study, is especially unique. In order to implement the appropriate treatment, it is important to distinguish metastatic from primary breast lesions. This can be best accomplished by being cognizant that the breast is an atypical, but possible, target for metastases. Breast metastases may resemble primary breast cancer under mammography and ultrasound. However, they usually lack the microcalcifications and spiculations characteristic of primary breast cancer. Tissue biopsies of the suspicious breast lesion are crucial for the correct diagnosis that will subsequently guide disease management and treatment.

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