



# Metastatic endometrial endometrioid carcinoma with clear cell changes to the breast: a case report

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## ABSTRACT

Metastasis to breast from extramammary tissue is rare, and endometrial cancer has rarely been reported to metastasize to the breast. An extensive search in the medical literature reveals only 2 cases. They can be easily mistaken for primary breast carcinoma both clinically and radiologically, even with known history of endometrial carcinoma. This report presents a case of a 64-year-old woman who had endometrial carcinoma treated with total hysterectomy and adjuvant radiation and chemotherapy. Three years after the diagnosis, she had evidence of a solitary breast metastasis. To our knowledge, this is the third described case of endometrial cancer metastatic to the breast and the first in which the endometrial carcinoma demonstrates significant clear cell changes. This report is a reminder that although rare, endometrial carcinoma has the potential to metastasize to breast and illustrates how metastatic lesions in the breast can masquerade clinically as a primary carcinoma. Furthermore, essential guidelines necessary to distinguish primary from metastatic lesions in the breast are presented.

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## 1. Introduction

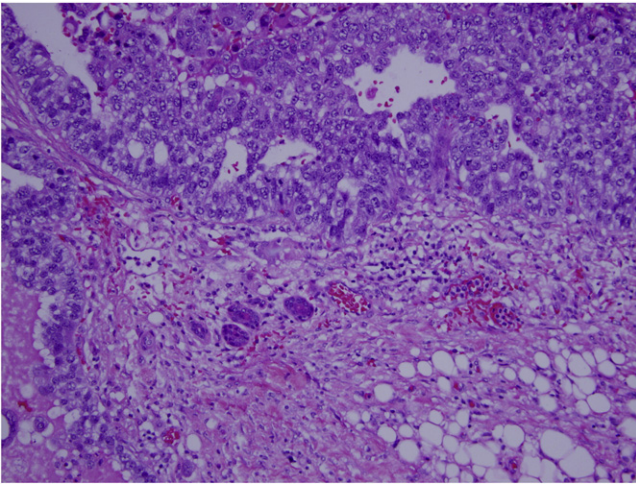
Metastatic nonmammary malignant tumors (MNMTs) to the breast are rare and represent approximately 2% of all breast tumors [1–3]. The rarity of this metastasis is not clearly explained. They are easily mistaken for primary breast tumor. Most MNMTs originate from lymphoma, metastatic melanoma, and pulmonary carcinoma [1,4–6]. Metastases from gastrointestinal malignancies such as esophageal, gastric, and colorectal primaries are much less frequent [1,2,4–7]. In children, rhabdomyosarcoma is reported to be the most common primary source of metastatic breast tumors [6]. Overall, metastatic neoplasms to breast from uterine primary have twice been reported. One case was described by Rosen [8] in his book *Rosen's Breast Pathology* (third edition) of metastatic poorly differentiated endometrial carcinoma showing a solid, infiltrating carcinoma with areas of comedonecrosis. The second case was reported in the literature as a metastatic endometrial stromal sarcoma, and the breast metastasis was part of a disseminated disease [9]. To our knowledge, this is the third reported case of metastatic endometrial tumor to the breast, second reported case of metastatic endometrial carcinoma to the breast, and first in which the endometrial carcinoma shows extensive clear cell changes. We will describe the clinical presentation, histomorphological features, and differential diagnoses of the metastatic tumors in the breast. The distinction between MNMT to the breast and primary mammary carcinoma is critical to avoid

unnecessary surgery and to ensure appropriate chemotherapy or radiation therapy.

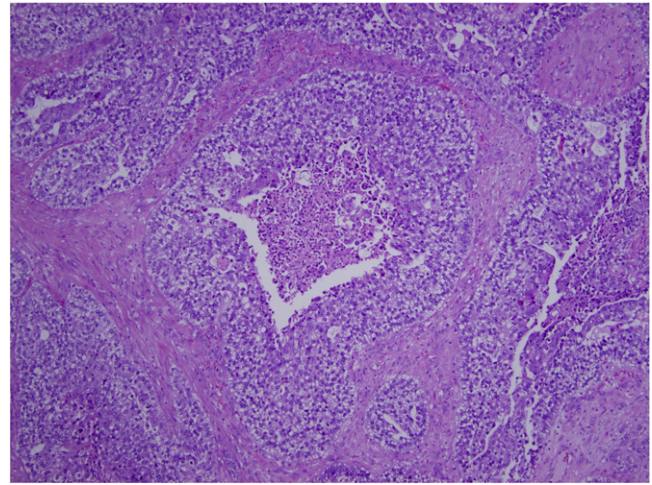
## 2. Case report

A 64-year-old woman with a history of endometrial adenocarcinoma presented with a large breast mass and chest pain. She was diagnosed with endometrial carcinoma that invaded the entire myometrium and local metastases to the lymph nodes and ovaries. No distant metastatic disease was identified. After total abdominal hysterectomy, the patient received adjuvant radiation and chemotherapy. The patient remained stable for 3 years, when she noticed a mass in her right breast that was rapidly increasing in size. Clinical examination revealed a right breast mass measuring 8.0 cm in greatest dimension that extended to the anterolateral chest wall. The mass was firm in consistency and very suspicious for malignancy. Ultrasound revealed a large well-defined soft tissue density, which demonstrated atypical hyperechoic appearance without spiculation highly suspicious for metastases. Given the patient's pain symptom and ultrasound finding, she underwent a right mastectomy and resection of the right chest wall, along with ribs 4, 5, 6, and 7 dissections. Gross examination revealed an 8.0 × 6.0 × 2.5 cm fungating, ulcerated, white-tan variegated tumor. Microscopic examination revealed a metastatic endometrial endometrioid carcinoma to breast parenchyma. The endometrial carcinoma was classified as endometrioid based on the typical architecture of endometrioid carcinoma and occasional presence of squamous metaplasia (Fig. 1). The metastatic endometrial carcinoma demonstrated large areas of

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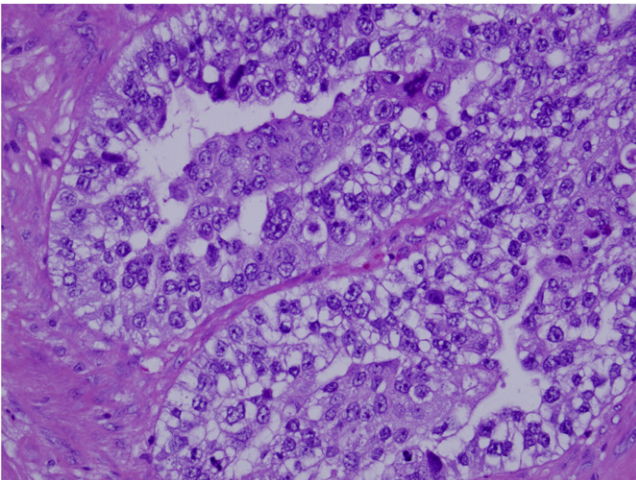


**Fig. 1.** Metastatic endometrial endometrioid adenocarcinoma infiltrating breast tissue.



**Fig. 3.** The metastatic endometrial carcinoma shows multiple foci of solid areas of poorly differentiated carcinoma with central necrosis that mimics DCIS.

clear cells in the form of basilar cytoplasmic vacuoles and represents more than 70% of the metastatic tumor (Fig. 2). There were solid areas of poorly differentiated carcinoma with central necrosis that mimicked ductal carcinoma in situ (DCIS) (Fig. 3). A review of the patient's primary tumor revealed poorly differentiated endometrioid endometrioid adenocarcinoma FIGO grade III with similar morphology of the metastatic tumor and was significant for such findings of the solid areas with central necrosis (Fig. 4). Sections from the mastectomy specimen were fixed in 10% neutral-buffered formalin and processed for light microscopy via conventional methods. Routine processing for histologic examination included paraffin embedding, sectioning, and staining with hematoxylin and eosin. Sections prepared from the formalin-fixed, paraffin-embedded tissue blocks were used for immunohistochemical analysis. These sections were processed via the Dako EnVision+ System-HRP kit (Dako North America, Inc, Carpinteria, Calif). The antibodies used included vimentin, p63, GCDFP (gross cystic disease fluid protein-15), mammoglobin, CK 20, CK 7, and CEA (carcinoembryonic antigen). Appropriate positive and negative controls were performed for each immunohistochemical stain. The neoplastic cells demonstrated strong positivity with vimentin and CK 7 stains. Focal positivity was seen with CEA and CK 20 stains. The remaining stains were negative. The staining pattern and similar morphology of the primary endometrial tumor and metastatic tumor supported the diagnosis of metastatic endometrial adenocarcinoma.

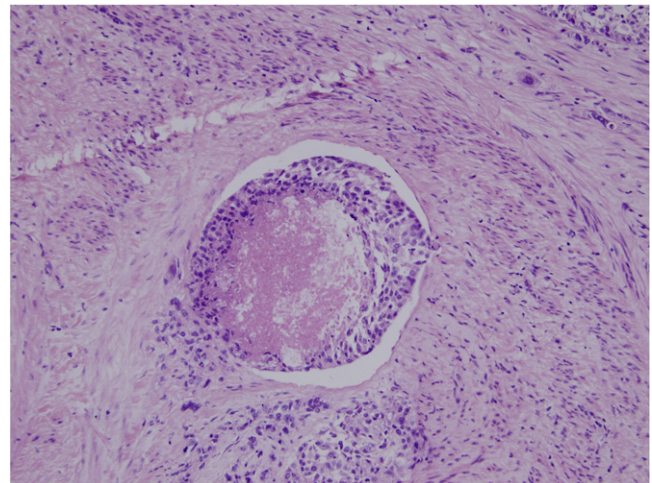


**Fig. 2.** Metastatic endometrial carcinoma demonstrates significant clear cell changes and the neoplastic glands lined by nuclei had a basilar location.

### 3. Discussion

Metastatic tumors to the breast are mostly (98%) from ipsilateral or contralateral primary breast carcinoma. Of the remaining extramammary breast metastases (2%), the majority are from lymphoma, malignant melanoma, or pulmonary carcinoma [1,2,4-7].

Guidelines to suspect the possibility of metastasis and distinguish it from primary breast carcinoma have been previously described [6,14]. It is important to consider metastatic tumor in the differential diagnosis when faced with any breast lesion that has unusual clinical, radiologic, gross, or microscopic features. This concern applies to routine biopsy and cytology specimens [10] and to mammography [11]. Radiographically, metastatic tumors are generally well circumscribed in contrast to primary tumors, which have peripheral spiculation due to the desmoplasia [11]. Unlike primary breast carcinoma, metastases usually lack microcalcifications. In addition, the clinical and mammographic sizes of the metastatic tumor are comparable, whereas the clinically palpable size of the primary tumor due to the associated desmoplasia is usually larger than the mammographic size. Rapid growth is another characteristic of metastatic tumors. The average interval to the development of a mammary metastasis is approximately 2 years for patients with previously treated cancer. Usually, there have already been



**Fig. 4.** Section of the primary endometrial carcinoma shows similar foci of solid areas of carcinoma with clear cell changes and central necrosis that was seen in the metastatic tumor to the breast.

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