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# Primary peritoneal serous papillary carcinoma that metastasized to an axillary lymph node in a woman with a history of breast cancer: A case report and diagnostic pitfalls ☆

Kazuhiro Nomoto [a,*], Takahiko Nakajima [b], Shigeharu Miwa [b], Shinichi Hayashi [b], Koichi Tsuneyama [b]

[a] *Laboratory of Pathology, Takaoka Kouseiren Hospital, Takaoka, Japan*
[b] *Department of Diagnostic Pathology, Graduate School of Medicine and Pharmaceutical Science, University of Toyama, Toyama, Japan*

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**Abstract** Herein, we will report on a patient with primary peritoneal serous papillary carcinoma that metastasized to an axillary lymph node and who had previously undergone a mastectomy and chemotherapy for carcinoma of the right breast. A 40-year-old Japanese woman underwent partial resection of her left lung for metastatic breast cancer at our hospital. Thirteen years later, she developed a left axillary lymph node swelling, and a biopsy was performed. Histological findings were compatible with metastatic breast carcinoma. Positron emission tomography–computed tomography revealed systemic lymphadenopathy, peritoneal nodules, and a liver mass. The patient was diagnosed with recurrent breast cancer and underwent additional chemotherapy. Six months later, she developed ascites. She was diagnosed with serous adenocarcinoma using conventional and immunocytological examinations of the ascites. She underwent suboptimal debulking surgery, consisting of a total hysterectomy, bilateral oophorectomy, and partial omentectomy. The final pathological diagnosis was primary peritoneal serous papillary carcinoma.

The diagnosis and pitfalls of this case will be presented.


## 1. Introduction

Primary peritoneal serous papillary carcinoma (PSPC) is a rare disease. Metastases of PSPC to the axillary lymph nodes (LNs) are uncommon, with only isolated cases reported thus far. Most patients who develop metastatic disease have a history of advanced-stage PSPC. Breast and/or axillary LN involvement upon initial presentation can occur but is rare. These metastases may represent a diagnostic pitfall for pathologists, because these metastases could mimic those from the primary breast carcinoma. Differentiating between metastatic and primary tumors of the breast is of great importance, because treatment and prognosis differ markedly [1]. In this case report, we will present a patient who had a primary peritoneal serous papillary carcinoma that metastasized to a left axillary LN and who had previously undergone a mastectomy and chemotherapy for

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* Corresponding author: Kazuhiro Nomoto, M.D., Laboratory of Pathology, Takaoka Kouseiren Hospital, 5-10 Eirakucho, Takaoka City, Toyama 933-8555, Japan. Tel.: +81 766 21 3930; fax: +81 766 24 9509.
*E-mail address:* nomoto03158@kouseiren-ta.or.jp (K. Nomoto).

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carcinoma of the right breast; we will also discuss potential diagnostic pitfalls.

## 2. Case report

A 40-year-old Japanese woman with no family history of cancer and an unknown *BRCA* status was referred to our hospital for treatment of a breast cancer metastasis to the lung. Six years prior to this referral, she had undergone a mastectomy and adjuvant chemotherapy for a right breast carcinoma. The details of that treatment are unknown. Partial resection of segment 6 of the left lung was performed. A histopathological examination of the resected specimen revealed tumor cells that were arranged in clusters and trabeculae, as well as fibrosis. The tumor cell nuclei were moderately pleomorphic. Immunohistochemical staining indicated that the carcinoma cells were estrogen receptor (ER) positive and progesterone receptor (PgR) negative. The HER2 score was 0. These findings were consistent with metastatic breast carcinoma (Fig. 1). The patient received additional chemotherapy with docetaxel. Thirteen years later, the patient felt tightness in the left axillary region. She underwent ultrasound (US)-guided needle biopsy of a swollen left axillary LN. The histopathological findings were characteristic of invasive micropapillary carcinoma (IMPC) (Fig. 2). Immunohistochemical staining indicated that the carcinoma cells were ER positive and PgR negative. The HER2 score was 0. These findings were compatible with metastatic breast carcinoma. Her serum cancer antigen 15-3 (CA15-3) was 494 U/mL (normal, < 27 U/mL). Positron emission tomography–computed tomography (PET-CT) performed at the time of biopsy revealed right supraclavicular, bilateral axillary, mediastinal, para-aortic, and pelvic lymphadenopathy, as well as multiple peritoneal nodules and multiple masses in the liver. She was diagnosed with recurrence of her breast carcinoma and underwent additional chemotherapy consisting of eribulin, followed by fluorouracil, epirubicin, and cyclophosphamide. Six months later, the patient noticed abdominal distension. US and CT evaluations revealed massive ascites. A cytological examination of the ascites demonstrated numerous of atypical cells, suggesting serous adenocarcinoma or mesothelioma (Fig. 3). Immunohistochemical staining of sections of a cell block prepared from the ascites fluid demonstrated that the tumor cells were positive for calretinin, Wilms' tumor-1 (WT1) protein, cytokeratin (CK)-7, Ber-EP4, epithelial membrane antigen (EMA), and paired-box-gene-8 protein (PAX8) expression and negative for gross cystic disease protein fluid (GCDFP)-15, CK-20, ER, CK-5/6, and carcinoembryonic antigen expression (Fig. 4). Because of these findings, she was diagnosed with serous adenocarcinoma. Her serum CA-125 was 10,455 U/mL (normal, <35 U/mL). She underwent suboptimal debulking surgery, consisting of a total hysterectomy, bilateral oophorectomy, and partial omentectomy. Intraoperative findings showed multiple omental masses and numerous small peritoneal nodules, as well as an intact uterus and bilateral ovaries. The final pathological diagnosis was primary peritoneal serous papillary carcinoma. Immunohistochemical staining of the paraffin sections of the left

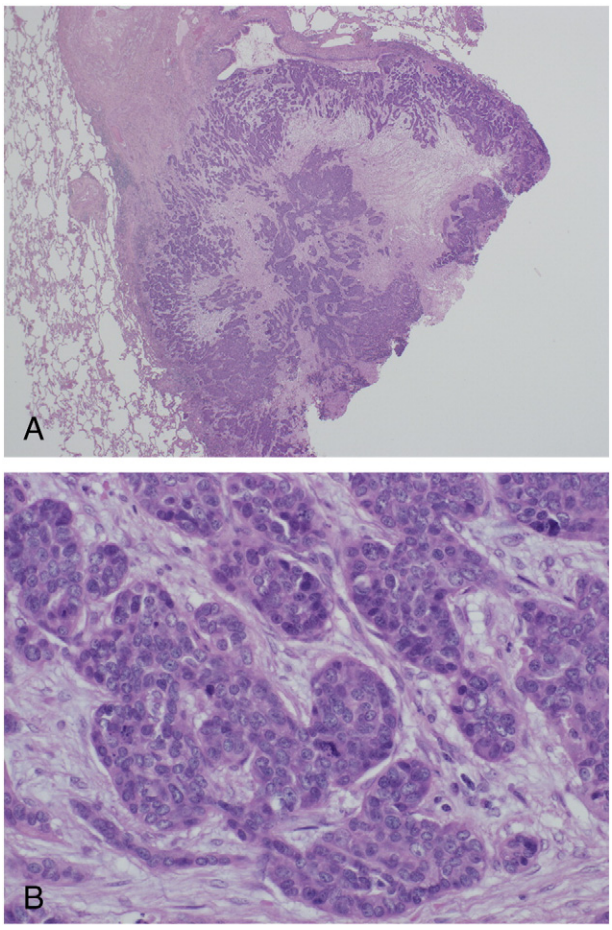


**Fig. 1** The lung tumor specimen shows tumor cells arranged in clusters and trabeculae, as well as fibrosis (A). The tumor cell nuclei were moderately pleomorphic (B).

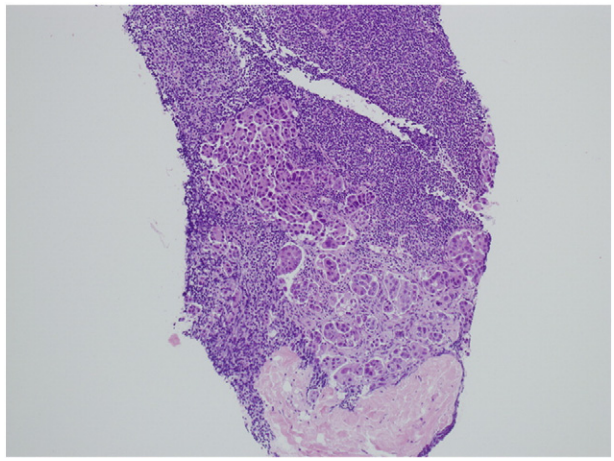

**Fig. 2** The left axillary lymph node has features characteristic of invasive micropapillary carcinoma.