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A Rare Case of Fallopian Tube Metastasis Presenting as a Solitary Breast Mass

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Abstract

Metastases to the breast from a nonmammary primary are rare. Primary fallopian tube carcinoma is one of the rarest malignancies of the female genital tract. Therefore, breast metastases from primary fallopian tube carcinoma are considered extremely rare.

In this article, we shared the case of serous carcinoma of fallopian tube with metastasis to an intramammary lymph node, presenting as a solitary breast mass. On initial staging ^{18}F-fluorodeoxyglucose (FDG) positron emission tomography/computed tomography for this patient with serous carcinoma of fallopian tube, a solitary FDG avid breast mass was found, along with FDG avid multistation nodes. The breast mass was evaluated with diagnostic mammogram and ultrasound and eventually biopsy of this mass revealed metastatic lymph node from carcinoma of fallopian tube origin.

Keywords
- breast
- metastases
- fallopian tube
- cancer

Case Presentation

A 64-year-old female presented with 3 months onset of right-sided pelvic pain. Pelvic ultrasound showed a right adnexal mass (►**Fig. 1**), with the right ovary not identified separately. Magnetic resonance imaging of pelvis (►**Figs. 2** and **3**) revealed that the right adnexal mass was external iliac chain nodal mass. Both ovaries were atrophic. CA 125 tumor marker was elevated, measuring 203 units/mL. Right iliac node biopsy demonstrated metastatic poorly differentiated adenocarcinoma of Mullerian primary.

Subsequently, hysterectomy, bilateral salpingo-oophorectomy, and pelvic node dissection was performed, and surgical pathology demonstrated high-grade serous carcinoma in both fallopian tubes and pelvic nodes. The tumor cells were immunoreactive for CK7, PAX8, P53, WT1, and P16 supporting serous carcinoma (►**Fig. 4**). The presence of serous intraepithelial carcinoma and tubal involvement supported fallopian tube origin.

^{18}F-fluorodeoxyglucose (FDG) positron emission tomography/computed tomography (PET/CT) for staging demonstrated FDG avid enlarged right external iliac, and peri-aortic nodes. A 1 cm FDG avid posteromedial left breast mass was also noted (►**Figs. 5** and **6**).

Diagnostic mammogram did not demonstrate the breast mass due to its far posterior location. Targeted breast ultrasound demonstrated a 1.1 cm hypoechoic left breast mass with indistinct margins at 7 o' clock, 5 cm from the nipple (►**Fig. 7**), Breast Imaging Reporting And Data System: 4, suspicious, with recommendation for biopsy. Ultrasound-guided biopsy of the breast mass (►**Figs. 8** and **9**) revealed metastatic poorly differentiated carcinoma of primary Mullerian origin involving a lymph node, with tumor profile

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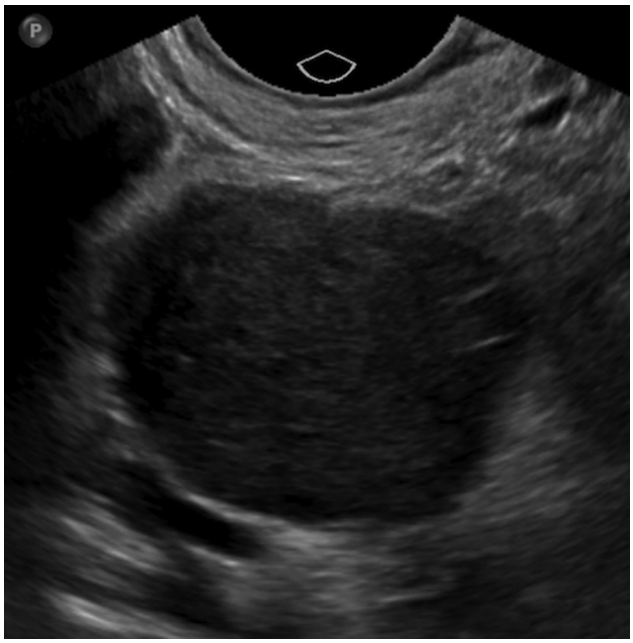


Fig. 1 Transvaginal pelvic ultrasound demonstrated a solid hypoechoic right adnexal mass measuring approximately 2.6 × 3.9 × 3.3 cm. Right ovary was not seen separately from the mass.

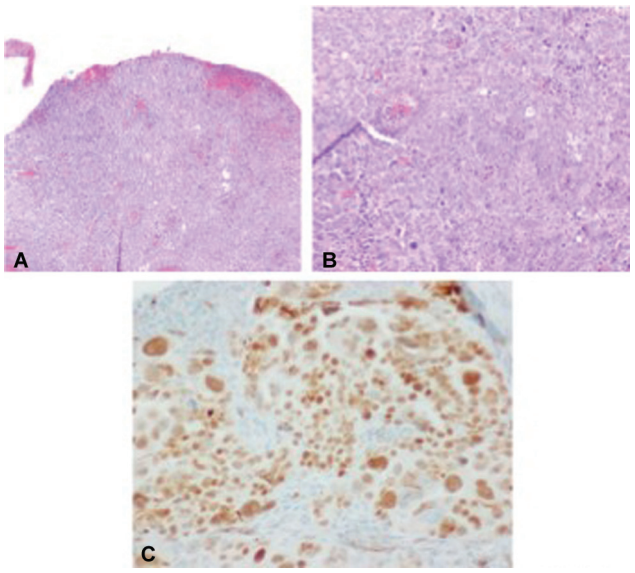


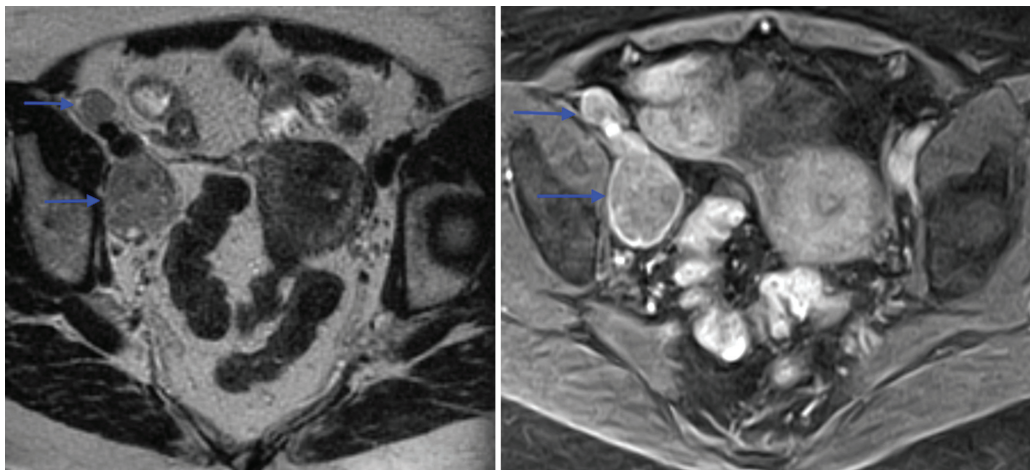
Fig. 4 Medium-power view (**A**) and high-power view (**B**) of serous carcinoma of the fallopian tube. WT1 immunostain demonstrates nuclear immunoreactivity in the tumor cells (**C**).

positive for WT1, and PAX8 (►**Fig. 10**). Since initiating chemotherapy, ^{18}F-FDG PET/CT has shown decrease in size and FDG avidity of all nodes, including resolution of FDG avidity in the breast mass (►**Fig. 11**).

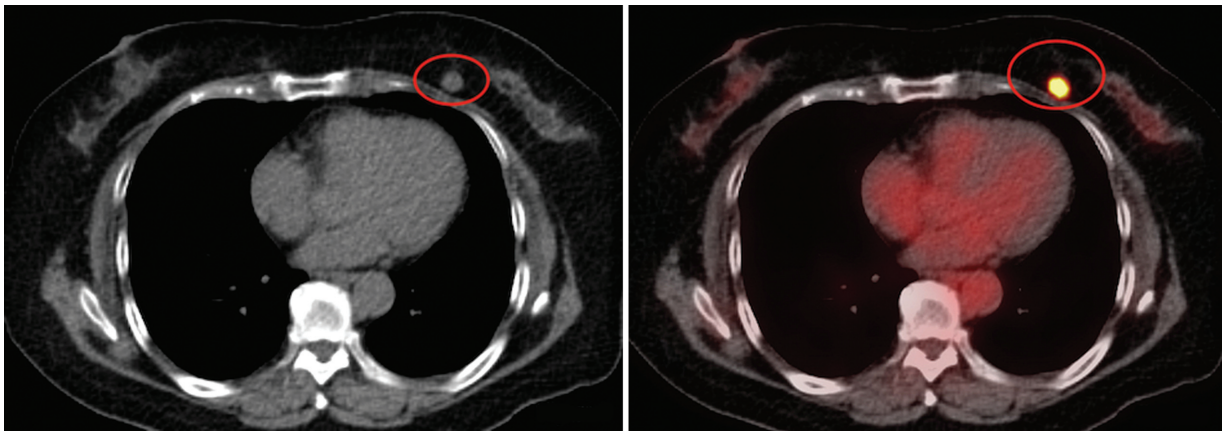
Discussion

Primary fallopian tube carcinoma (PFTC) is rare, representing around 1% of gynecologic malignancies.[1] In 2014, revised International Federation of Gynecology and Obstetrics staging incorporated ovarian, fallopian tube, and peritoneal cancers into a common group, called "Mullerian carcinomas," due to considerable overlap in origin and histology. Metastases of these Mullerian carcinomas commonly go to the peritoneal cavity, inguinal, and para-aortic nodes[2] with breast metastases being extremely rare.[3–5] From review of literature, our case is the fourth documented case of breast metastasis from PFTC, with previous cases reported by Fishman et al in 1994, Papakonstatinou et al in 2009, and Buyukkurt et al also in 2009.[3,6,7] All reported cases of PFTC with breast metastasis vary in their presentation, with the unifying factor being advanced stage at diagnosis.

Nonmammary metastasis to the breast is rare. It is important to differentiate primary breast cancer and breast metastasis presenting as a solitary breast mass, due to significant implications on treatment and prognosis. On imaging, breast metastases present as single or multiple round masses with circumscribed margins.[8] The final diagnosis depends on immunohistochemical results. Mullerian carcinomas are positive for PAX8 and WT1 for both primary tumor and metastasis.[8]



Figs. 2, 3 Magnetic resonance imaging pelvis (►**Fig. 2**—axial T2-weighted image and ►**Fig. 3**—axial post-contrast venous phase image) demonstrated right external iliac chain nodal masses (blue arrow), largest measuring 3.3 × 2.8 × 5.1 cm. Both ovaries were atrophic.



Figs. 5, 6 ^{18}F-fluorodeoxyglucose positron emission tomography-computed tomography study demonstrated fluorodeoxyglucose avid 1 cm posteromedial left breast mass (red circle).

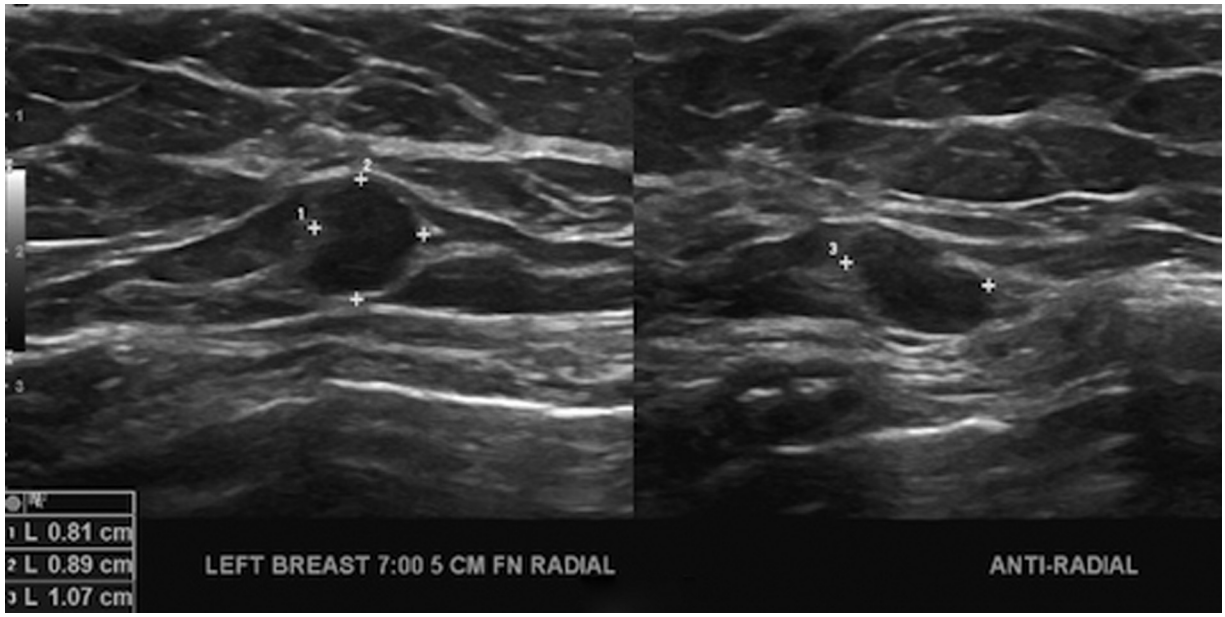
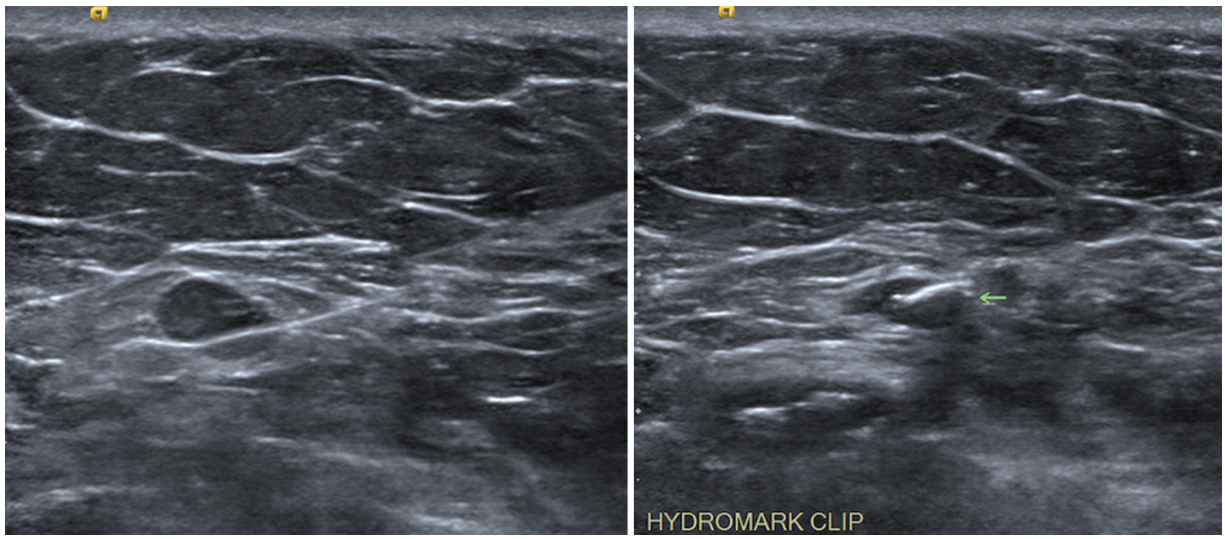


Fig. 7 Targeted left breast ultrasound demonstrated a hypoechoic solid mass with indistinct margins, measuring 0.8 × 0.9 × 1.1 cm, at 7:00, 5 cm from the nipple.



Figs. 8, 9 Ultrasound-guided left breast biopsy of the suspicious mass at 7:00, 5 cm from the nipple performed (►**Fig. 8**) with appropriate placement of HydroMark clip (►**Fig. 9**).

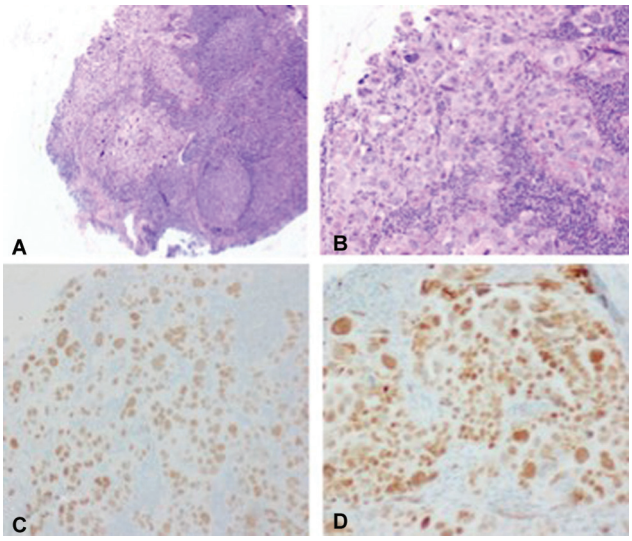


Fig. 10 Low power (**A**) and high power (**B**) views of breast biopsy specimen demonstrate high-grade metastatic serous carcinoma involving lymphoid tissue. PAX8 (**C**) and WT1 (**D**) immunostains demonstrate nuclear immunoreactivity, supporting tubal origin.

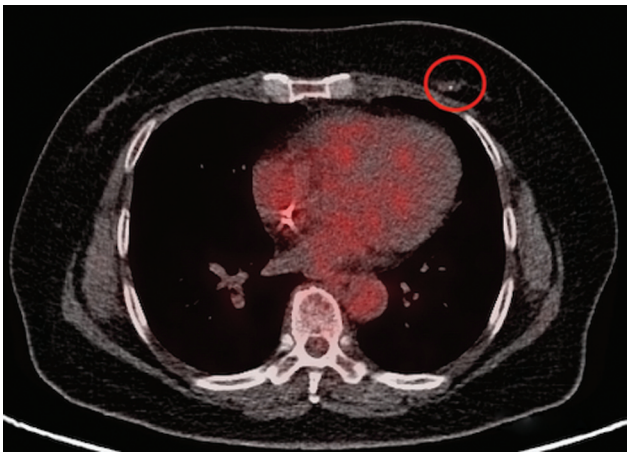


Fig. 11 Post-chemotherapy ^{18}F-fluorodeoxyglucose positron emission tomography-computed tomography study demonstrates the posteromedial left breast mass with a biopsy clip (red circle) and without any fluorodeoxyglucose uptake.

Conclusion

Our case highlights that breast metastasis remains an important differential in a patient with known primary cancer and a breast mass. Atypical cancer metastases, including breast metastasis from Mullerian cancers, may be encountered more frequently, due to prolonged survival and advances in imaging and treatment. It is, therefore, important to document and share unique presentations of these metastatic Mullerian cancers.

Conflict of Interest
None declared.

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