Case Report
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대한영상의학회지

Solitary Axillary Lymph Node Metastasis without Breast Involvement from Ovarian Cancer: Case Report and Brief Literature Review[1]

난소암의 유방 전이를 포함하지 않은 단일 액와부 림프절 전이: 증례 보고 및 문헌고찰[1]

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Axillary lymph node metastasis without breast involvement from ovarian cancer is rare. We report a case of a 68-year-old woman proven as ovarian serous papillary carcinoma and metastatic papillary carcinoma of the omentum on surgical diagnostic laparoscopy. In addition, a hypermetabolic lymph node was detected in left axilla and was considered a reactive benign lesion. Mammography and ultrasonography showed no focal lesion in both breasts, but ultrasonography-guided core needle biopsy for the lymph node revealed metastatic serous papillary carcinoma from ovarian origin. Even with a low incidence of axillary lymph node metastasis without breast involvement from ovarian cancer and only marginally elevated standardized uptake value in positron emission tomography, the possibility of metastasis at axillary lymph node in patients with known primary ovarian cancer must be considered.

Index terms
Ovarian Cancer
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Breast

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INTRODUCTION

Ovarian cancer is the fifth most common cause of cancer death in women, usually presenting with metastasis to intraperitoneal organs. Metastases beyond the abdominal cavity at initial presentation are rare, especially in cases involving the breast and/or axillary lymph node. Axillary metastases from ovarian carcinoma are usually present with breast metastasis. However, isolated axillary lymph node metastases without breast involvement have been detected (1).

This report illustrates a rare case of a solitary axillary metastasis from ovarian cancer without breast involvement. We focus on the radiologic features of axillary lymph nodes to help differentiate benign from metastasis and discuss the importance of accurate diagnosis for axillary lesions with underlying ovarian malignancy.

CASE REPORT

A 68-year-old woman presented with a 10-day history of abdominal distension. She was taking medications for hypertension and diabetes mellitus, with no other remarkable past medical history and no significant family history. There was abdominal shifting dullness in physical examination, and ascites was suspected

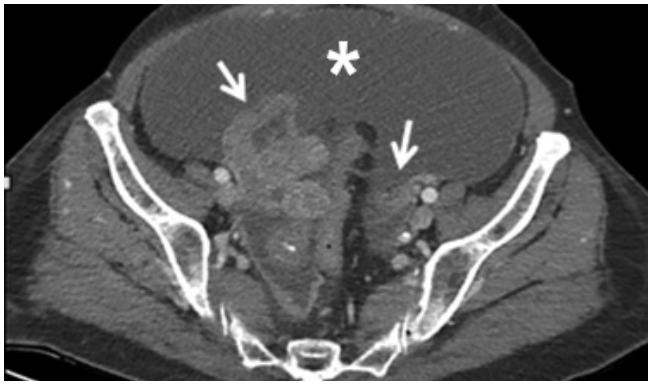
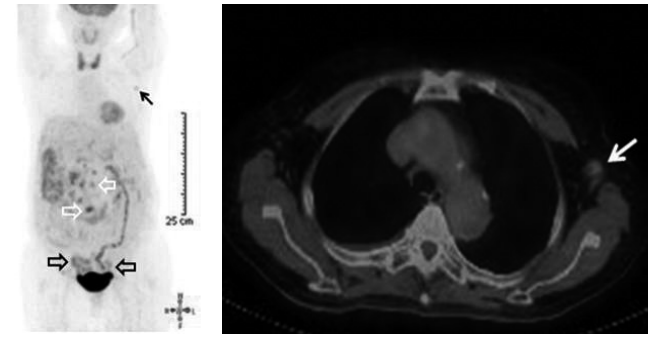


Fig. 1. Venous phase image of abdominopelvic CT shows bilateral solid and cystic masses (arrows) in both ovaries with massive ascites (*). After the diagnostic laparoscopy, biopsy was proven as ovarian serous papillary carcinoma.



A B

Fig. 2. Maximum intensity projection (MIP) image **(A)** of ^{18}F-FDG PET/CT shows hypermetabolic lesions (SUVmax = 4.9 g/mL, black empty arrows) in both ovarian masses consistent with primary malignancy and hypermetabolism (SUVmax = 4.9 g/mL, white empty arrows) in multiple mesenteric nodules which cannot be ruled out peritoneal seeding. Furthermore, MIP image **(A)** and axial CT image **(B)** of ^{18}F-FDG PET/CT show hypermetabolism (SUVmax = 2.1 g/mL) in left axilla (arrows) which might be a reactive benign lymph node.
Note.—SUVmax = maximum standardized uptake value, ^{18}F-FDG PET/CT = ^{18}F-fluorodeoxyglucose positron emission tomographic/computed tomography

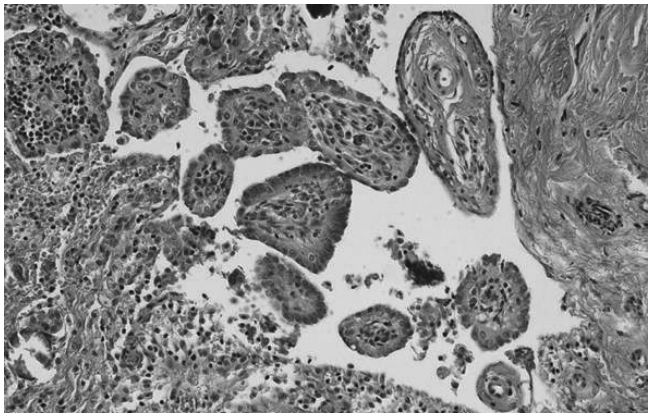


Fig. 3. Photomicrograph of ovary shows papillary structures lining fibrovascular core with psammoma bodies demonstrating serous papillary carcinoma (H&E stain, × 200).

in an abdominal ultrasonography performed at a local hospital.

For the further evaluation, abdominopelvic computed tomography (CT) was done, which detected bilateral ovarian solid and cystic mass lesions, as well as peritoneal carcinomatosis with ascites (Fig. 1). The chest X-ray revealed pleural effusion. Ascites tapping was done, and the cytology revealed metastatic carcinoma. CA-125 level was elevated to 660.9 U/mL and carcinoembryonic antigen level was 0.781 ng/mL.

^{18}F-fluorodeoxyglucose (^{18}F-FDG) positron emission tomography/CT (PET/CT) scan was performed. There were hypermetabolic lesions [maximum standardized uptake value (SUVmax) = 4.9 g/mL] in both ovarian masses consistent with primary malignancy, and hypermetabolic lesions (SUVmax = 4.9 g/mL) in multiple mesenteric nodules with ascites. Peritoneal seeding could not be excluded. Hypermetabolism (SUVmax = 2.1 g/mL) in left axillary lymph node indicated the possibility of a reactive benign lesion (Fig. 2).

Endoscopy and colonoscopy were also performed to rule out ovarian metastasis of gastrointestinal origin. There was no evidence of malignancy.

Surgical diagnostic laparoscopy was performed. Multiple small myomas were evident in the uterus, and both ovaries were papillary shaped with a whitish cancer-like appearance. On biopsy, serous papillary carcinoma of the right ovary and metastatic papillary carcinoma of the omentum were proven (Fig. 3).

After the operation work-up, mammography and breast ultrasonography were performed to evaluate the hypermetabolism of the left axillary lymph node on ^{18}F-FDG PET/CT. Mammography revealed two hyperdense enlarged lymph nodes containing central fatty hilum in the left axilla; the largest was up to 1 cm (Fig. 4). Breast ultrasonography revealed three lymph nodes (largest up to 1.4 cm) with eccentric cortical thickening and preserved fatty hilum in left axilla, which had prominent hilar blood flow on color Doppler scan. They were relatively benign in appearance, but considering clinical information we recommended ultrasonography-guided biopsy as category 4a, suspicious for malignancy (Fig. 5A, B). Otherwise, there were no suspicious malignant focal lesions in both breasts, on mammography, ultrasonography, and in ^{18}F-FDG PET/CT images. Pathologic finding with ultrasonography-guided core needle biopsy for the left axillary lymph node revealed metastatic serous papillary carcinoma of ovarian origin (Fig. 5C).

Finally, the patient was diagnosed with ovarian cancer stage IV. Carboplatin and Paclitaxel chemotheraphy was started. Radical hysterectomy, bilateral salphingo-oophorectomy, and pelvic lymph node dissection were done in a debulking operation after three cycles of neoadjuvant chemotherapy. In follow-up, the CA-125 tumor marker was decreased to 92.25 U/mL.

DISCUSSION

Ovarian cancer is the fifth leading cause of cancer death in women, usually presenting with metastases to other organs at the time of diagnosis. The primary mode of dissemination is intraperitoneal spread, predominantly confined to the intraperitoneal cavity. Metastasis through lymphatic channels to the pelvic and para-aortic lymph nodes has been documented (2). However, axillary lymph node metastasis is quite rare. Metastasis to the breast is found in only 0.07% of ovarian origin cancers (3), and it occurs generally in an advanced stage with a short time interval. Axillary metastases from ovarian carcinoma usually present with breast metastasis. Recine et al. (1) reported 14 cases of ovarian serous carcinoma with metastases to the breast and/or axillary lymph nodes; 6 patients (43%) had simultaneous breast and axillary lymph node involvement and 5 patients (36%) displayed only lymph node metastases. Consequently, among 11 cases of all axillary lymph node invasions, 5 cases (45%) were only axillary lymph node metastasis without breast involvement.

The presence of abnormal axillary lymph nodes with otherwise negative mammographic findings is rare. The incidence of axillary lymphadenopathy alone without additional mammographic abnormalities in screening mammography is reportedly 0.02% (4). Malignant causes of lymph node enlargement with a negative mammogram other than primary breast cancer include metastases from lymphoma, malignant melanoma, or lung, stomach, or ovarian carcinomas. Benign causes include systemic inflammatory processes (sarcoidosis), infectious disease (bacterial lymphadenitis, tuberculosis), and collagen vascular diseases (5).

It is not always possible to differentiate benign lymphadenopathy from metastatic lymphadenopathy using only mammogra-

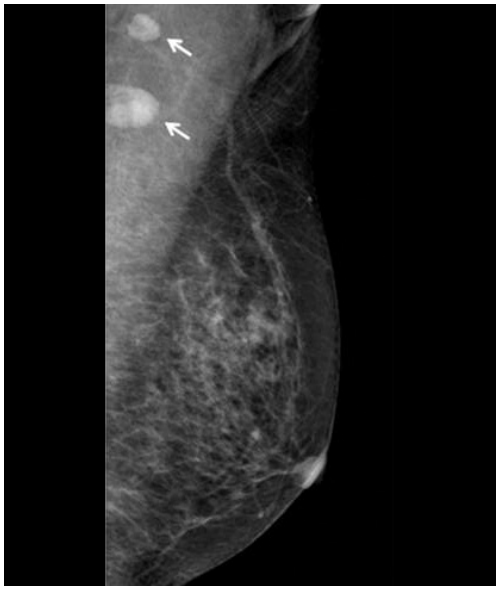
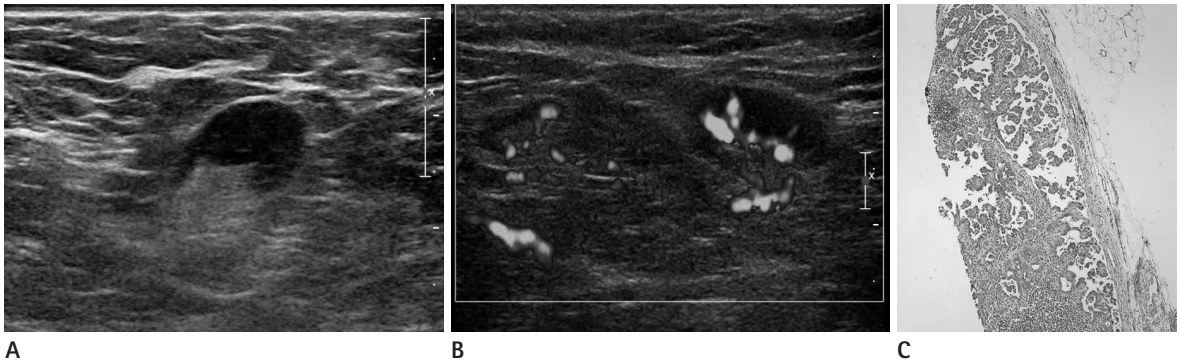


Fig. 4. Left breast MLO view of mammography shows two hyperdense enlarged lymph nodes containing central fatty hilums in left axilla (arrows), the largest one size up to 1 cm.
Note.—MLO view = mediolateral oblique view



A B C

Fig. 5. Ultrasonography and photomicrograph image of the left axillary lymph node.
A. Breast ultrasonography shows the largest one of three lymph nodes sized up to 1.4 cm, with eccentric cortical thickening and preserved fatty hilum in left axilla.
B. Color Doppler ultrasonography shows lymph nodes with prominent hilar blood flow.
C. Photomicrograph of left axillary lymph node shows abnormal papillary structures spreading in subcapsular area, which are similar with ovarian papillary lesion (Fig. 3). Normal lymph node structure is noted in the lower portion (H&E, × 100).

phy, and there are no consistent criteria for malignant lymph node diagnosis. Some of the proposed criteria for malignant lymph nodes have included size greater than 2 cm, round or irregular shape, absence of a fatty hilum, and increased density (6). In our case, the largest node was less than 2 cm, oval shaped rather than round, and with preserved central fatty hilum. These findings were not malignant features, except for hyperdensity. Metastatic axillary lymph nodes from ovarian cancer may present as calcifications on mammography. Singer et al. (7) reported three cases of calcified axillary lymph nodes identified on mammography; all had clinical histories and pathologic findings consistent with metastatic ovarian carcinoma. These calcifications were amorphous and peripherally distributed, which differed from the pleomorphic malignant-appearing calcifications described with axillary metastasis from papillary breast carcinoma. This pattern may be related to the pathologic finding of psammoma body formation (7). In our patient, the microscopic finding of metastatic axillary lymph node showed a low proportion of psammoma bodies, which could correlate with the absence of detection of calcification by mammography and sonography.

Additional ultrasonographic evaluation is helpful for further characterization and to improve the specificity of mammography. Shetty and Carpenter (6) reported a circular shape as the single best predictor of malignant lymph node on ultrasonography. Eccentric enlargement with focal thickening of the cortex and indentation or obliteration of the hilum are highly suggestive of malignant findings (8). In our case, eccentric cortical thickening with increased central blood flow was the only suspicious clue for malignancy, regardless of the features in mammography.

^{18}F-FDG PET/CT is more sensitive than CT in detecting lymph node metastasis, when nodal enlargement exceeds 1 cm. Usually, SUV values of malignant nodes are higher than 2.5, which is comparable with inflammatory nodes. Despite pathologically proven malignancy, an axillary lymph node in the present case showed a SUVmax of 2.1 on ^{18}F-FDG PET/CT. However, small nodes with metastasis, due to partial volume effects, may have a low SUV and low uptake by visual interpretation (9).

The most common tumor causing axillary lymphadenopathy in women is primary breast cancer (10). It is important to rule out primary breast cancer as a cause of axillary lymph node metastasis when accompanied by ovarian cancer, because the treatment and prognosis of breast and ovarian carcinomas are significantly different. Similarity in histologic features of ovarian and breast carcinoma can hinder differential diagnosis. Correlation with cytological findings of primary tumor and clinical history might be helpful in achieving correct diagnosis.

Axillary lymphadenopathy without visible breast cancer tends to underestimate the malignant potential. If a patient has no history of other primary malignancy, ultrasonographic follow-up is acceptable for small and benign appearing nodes, as an alternative to biopsy. However, despite the relatively benign feature of enlarged lymph nodes, careful scrutiny is important given a history of malignancy. The SUV of PET/CT could be helpful, but is not always accurate. If ultrasonography reveals least one feature suspicious for malignant features, fine needle aspiration or core needle biopsy is recommended for definite diagnosis.

In conclusion, despite low incidence of axillary lymph node metastasis without breast involvement from ovarian cancer and not appreciably high SUV in PET, the possibility of metastasis at the axillary lymph node in patients with known primary ovarian cancer must be considered. Also, when a solitary axillary lesion is detected in a patient with ovarian cancer, accurate diagnosis by pathologic confirmation with ultrasonography-guided biopsy is essential, because axillary lymph node metastasis is an important factor for choice of treatment.

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난소암의 유방 전이를 포함하지 않은 단일 액와부 림프절 전이: 증례 보고 및 문헌고찰[1]

최지인[1] · 김수진[1] · 박성희[1] · 김희성[2]

난소암의 유방을 포함하지 않는 액와부 림프절 전이는 흔하지 않은 것으로 알려져 있다. 본 증례의 68세 여성은 진단적 복강경검사에서 난소의 장액성 유두상 종양과 전이성 복막암으로 진단되었다. 추가적으로 좌측 액와부에서 과대사 림프절이 발견되었고 반응성 양성 병변으로 생각되었다. 유방촬영술과 초음파상에서도 유방 내 국소 병변이 보이지 않았으나, 림프절에 대한 초음파 유도하 조직검사상 난소에서 기원한 전이성 장액성 유두상 종양으로 확진되었다. 난소암의 유방을 포함하지 않는 액와부 림프절 전이 빈도가 높지 않고 양전자방출단층촬영에서 반응성 림프절의 표준섭취계수가 그리 높지 않더라도 난소의 원발성 악성 종양을 가진 환자에서는 액와부 림프절의 전이 가능성을 생각해 보아야 하겠다.

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