



Pleural metastasis from ovarian papillary serous carcinoma form Coral Reef like formation- A unique presentation

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Abstract

Papillary serous tumor of the ovary spreads locally to the pelvis and abdomen or through lymphatics. Hematological metastasis is rare and this is the route through which it spreads to thorax. However papillary serous tumor involving the lungs and pleura without involving the abdominal cavity is rare. Here we present a case of papillary serous carcinoma of ovary presenting as pleural metastasis without involving any abdominal organs. More over the thoracoscopic findings of this pleural lesion is unique in its appearance and has not been reported in literature previously.

Keywords: Coral reef, Sea anemone, papillary serous tumor, metastasis.

Introduction

The pleural cavity is the most frequent extra-abdominal site of metastasis for ovarian tumors. In patients with ovarian cancer and pleural effusions, a positive fluid cytology is required for a stage IV diagnosis. Among the ovarian tumors superficial serous papillary tumors are unique in its superficial surface involvement with multiple papillary projection and without any deeper involvement of the ovary. Laparoscopic appearance is comparable to sea anemone formation¹. Here we present similar presentation on the pleural surface due to metastasis from papillary serous tumor of the ovary.

Case report

A 68-year-old female presented with fever, cough and dyspnea of 45 days duration. She was admitted initially in a local hospital and treated with antibiotics. But her symptoms worsened and chest x-ray (Figure-1A) and high-resolution computed tomography (HRCT) thorax (Figure-1B) showed pneumonia right lower lobe (RLL) with moderate pleural effusion. She also mentioned about significant loss of appetite and loss of weight. She was not having any significant co morbidities except hypertension. Investigations revealed anemia and lymphocytic, low adenosine deaminase (ADA) pleural effusion.

Medical thoracoscopy was done which showed hemorrhagic pleural effusion with crowded metastatic deposit over the entire pleural surface.

The metastatic nodules were soft finger like projections resembling coral reef (Figure 2 A, B, C). Pleural fluid cytology was negative for malignant cell. MTB-PCR done with pleural fluid also was negative.

Histopathology report revealed papillary projections and pleomorphic cells with

hyperchromatic nuclei. Immunohistochemical staining with CK7, WT-1, PAX -8, P16 showed strong positivity suggesting pleural metastasis from papillary serous carcinoma, consistent with ovarian primary (Figure-3 A, B). Cancer Antigen 125 (CA-125) value was 69 U/ml (Normal range: 0-35 U/ml).

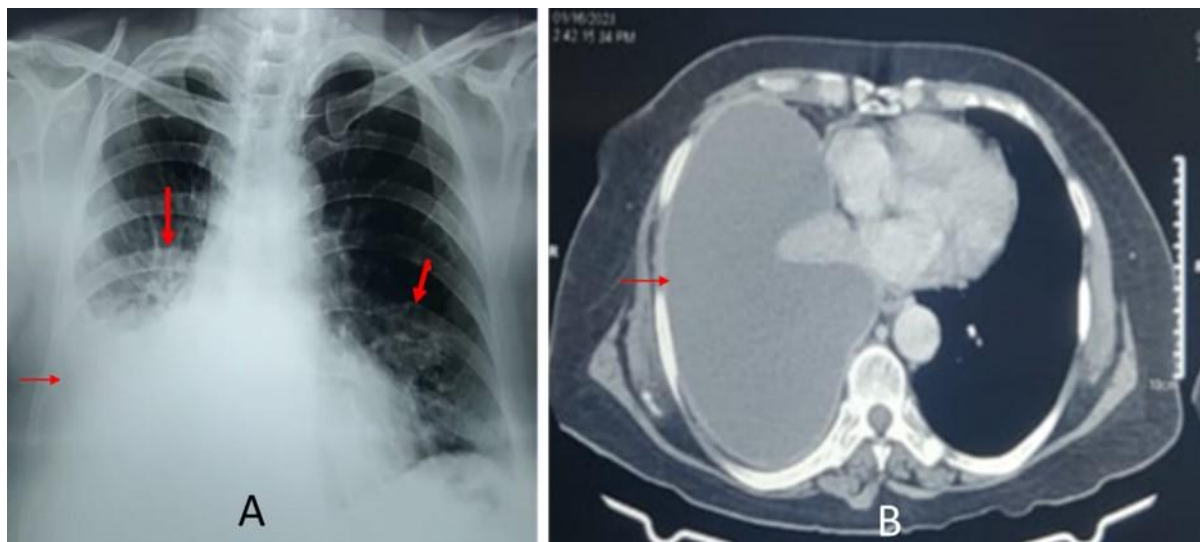


Figure-1A: X-Ray Chest PA view showing right moderate pleural effusion (Thin arrow) and non-homogenous infiltrates in the right and left lower zones (Thick arrow). 1B: CT Thorax axial cut showing moderate pleural effusion on the right side (Thin arrow).

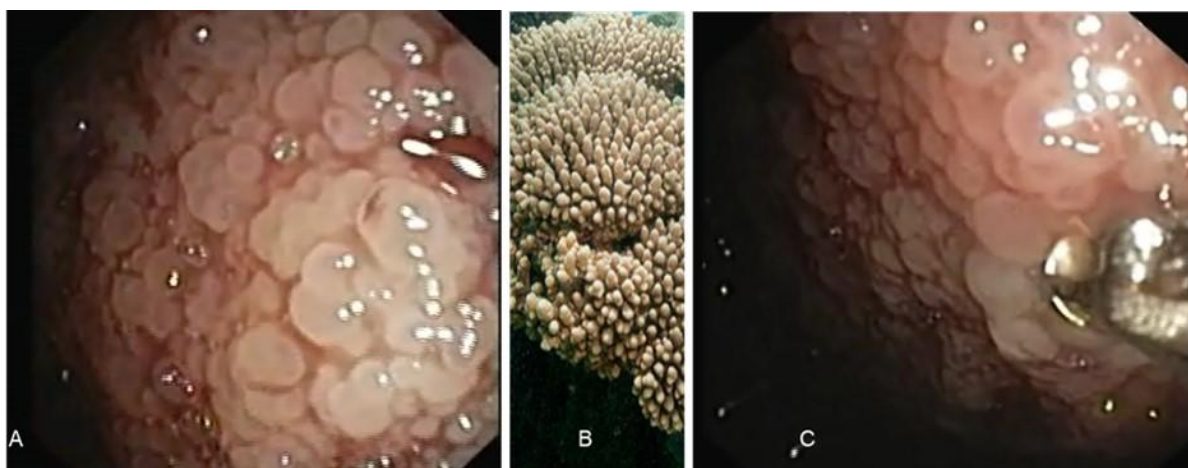


Figure-2A: Soft nodular projections covering the pleural surface. These projections resemble soft coral reef. 2B: Photo of coral reef shown for comparison. 2C: Biopsy done from the nodular formation.

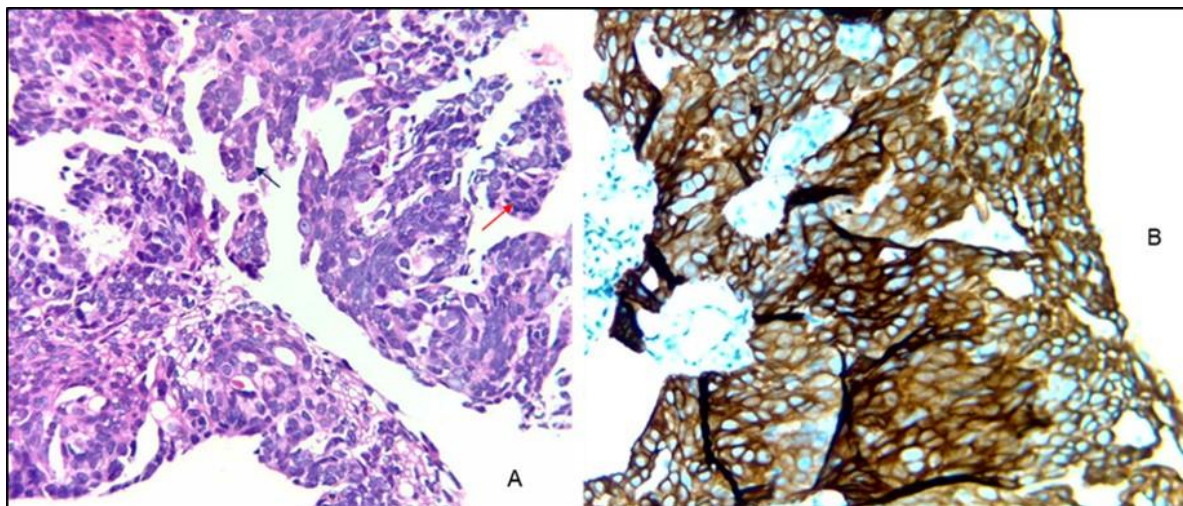


Figure-3A: Histopathology smear showing papillary projection (Black arrow) and pleomorphic cells with hyperchromatic nuclei (Red arrow). 3B: Immunohistochemical staining with CK7 showing positivity.

PET CT Scan showed Non FDG avid right pleural effusion. FDG avid diffuse pleural thickening (SUV max 5.3) in right lung suggestive of metastatic disease (Figure-4A)). FDG avid predominantly solid large round lesion (SUV max 13.7; -3.6 x 4.3 cm) in the right adnexa of uterus -suspicious for primary malignancy of ovarian origin (Figure-4B). Low grade FDG avid mediastinal and bilateral supraclavicular lymph nodes were seen, likely to be metastatic disease.

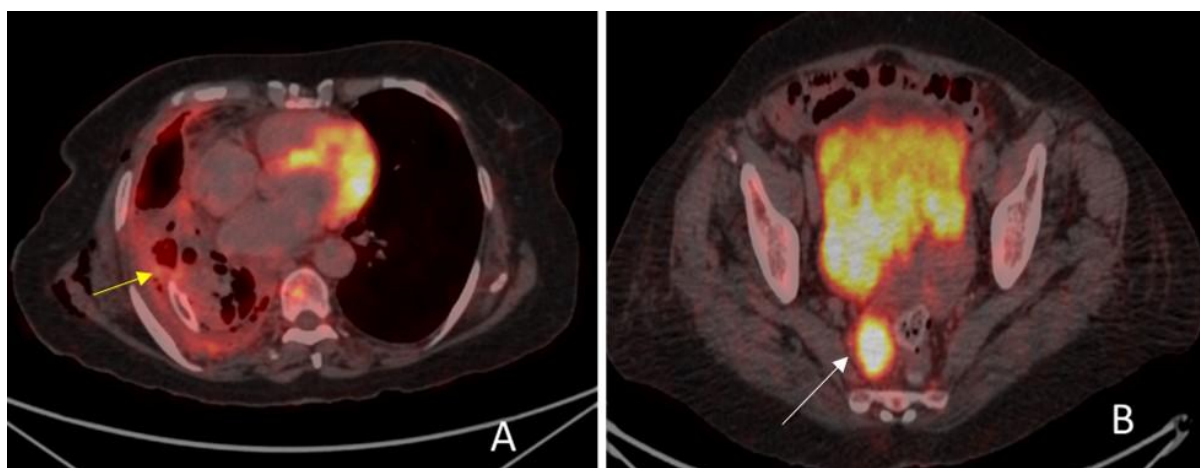


Figure-4A: PET CT Scan showed Non FDG avid right pleural effusion. FDG avid diffuse pleural thickening (SUV max 5.3) in right lung suggestive of metastatic disease (Yellow arrow). 4B: FDG avid predominantly solid large round lesion (SUV max 13.7; -3.6 x 4.3 cm) in the right adnexa of uterus - suspicious for primary malignancy of ovarian origin (White arrow). Low grade FDG avid mediastinal and bilateral supraclavicular lymph nodes present, likely to be metastatic disease.

Discussion

The pleural cavity constitutes the most frequent extra-abdominal metastatic site for ovarian carcinoma. In patients with ovarian cancer and pleural effusions, a positive fluid cytology is required for a stage IV diagnosis. Unfortunately, about 30% of malignant pleural effusions exhibit false-negative cytological pleural fluid results.

However medical thoracoscopy is the most preferred investigation in undiagnosed pleural effusions. This will enable visualization of the entire pleura for any deposits and biopsy from the most representative site. Medical thoracoscopy and biopsy increases the yield in primary or metastatic pleural diseases by 90-100%².

Authors report a unique and rare appearance of a metastatic ovarian cancer which resembles coral reef. This type of appearance is not reported earlier in literature. The appearance is not surprising as it is reported that serous papillary tumors of the ovary resembles sea anemone. They display a surface proliferative pattern and papillary excrescences on their surface¹. Gross findings, obtained through laparoscopy showed exophytic proliferation from the surface of the

ovary. Papillary projections are best identified on T2 weighted images. They appear as intermediate-to high-signal structures with low-signal internal branching^{1, 3-6}. Tanaka et al¹ described it as a sea anemone (Figure-5A, B) and confirmed it as a hallmark of serous surface papillary borderline tumor (SSPBT). SSPBT of the ovary is a highly malignant tumor because it forms entirely solid masses.

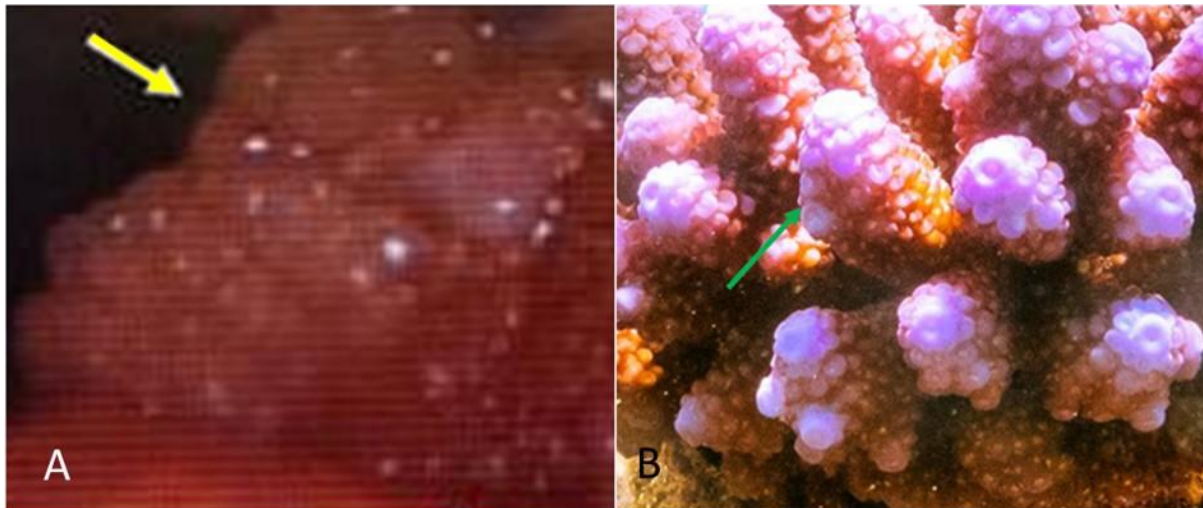


Figure-5A: Laparoscopic view of papillary serous tumor of ovary. Multiple nodular projections over the surface were seen (Yellow arrow). 5B: Photograph of sea anemone to draw comparison to papillary serous tumor (Green arrow). (Image Courtesy Tanaka YO et al)

Serous papillary carcinoma of the ovary is a highly metastatic cancer and more than 70% of ovarian cancer patients are diagnosed with metastasis⁷. Ovarian cancer has a unique pattern of metastasis where the hematogenous spread is less common. Ovarian cancer predominantly metastasizes within the peritoneal cavity and through the pelvic lymph nodes^{8,9}. However, recent evidence suggests the possibility of hematogenous metastasis of ovarian cancer¹⁰. Ovarian cancer cells mainly metastasize within the peritoneal cavity or pleural cavity, which involves exfoliation from the primary tumor. A key step for successful metastasis is their attachment and productive interactions with the mesothelial cells covering the metastatic organs leading to metastatic tumors. This pattern of metastatic growth over the peritoneal or pleural surface, look

like sheets of nodules and soft polypoid projections. This appearance resembles coral reef seen on coastal belt.

The final histopathological findings were numerous micro-papillae lined by one or two layers of cuboidal cells with hyperchromatic nuclei, suggesting a diagnosis of serous surface papillary tumor. The presence of abundant papillary projections is associated with serous borderline tumors⁶. They were histopathologically correlated with epithelial multilayering, forming papillae with a thick fibrous stalk^{11,12}.

Conclusion

The growth pattern of superficial serous tumor of ovary is referred to the sea anemone-like pattern which is a diagnostic hallmark. When these tumor

metastases to the mesenchymal surface of peritoneum or pleura it appears as sheets of polypoidal projections and when crowded on the surface it resembles coral reef seen on the coastal belt. Here we would like to conclude that coral reef metastasis is a diagnostic sign for pleural or peritoneal metastasis from superficial serous borderline papillary tumor or serous papillary carcinoma of ovary.

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