CASE REPORT

Metastatic Adenocarcinoma in the Ovaries from a Rare Primary

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Introduction

The ovaries are common sites for metastatic tumors, which account for approximately 10–30 % of all malignant ovarian tumors [1]. Most of the metastatic tumors arise from the primary in the gastrointestinal tract, breasts, and gynecologic organs [1, 2]. Of the reported series of ovarian metastasis, 60 % are diagnosed at autopsy and 63.3 % at prophylactic oophorectomies as in cases of breast carcinoma. Infrequently, they do present as ovarian masses synchronous with the primary tumor. It is important to recognize metastatic ovarian tumors as the staging, treatment modalities and prognostic implications are different from the primary tumors.

Case Report

A 38-year-old woman presented with a history of abdominal pain and abdominal distension of 3 days duration. On examination, she had a palpable, hard right supraclavicular lymph node. Per abdominal examination revealed a large, tender, firm abdominal mass arising from the pelvis and reaching up to the umbilicus, which was confirmed on ultrasound. The chest X-ray showed a right hilar mass. An abdomino-pelvic CT scan showed a large, heterogeneous lesion in the pelvic region with a suspicion of origin from the ovaries and a focal lesion in the left lobe of the liver. A bone scan also revealed multiple bone lesions. A bronchoscopy showed irregular unhealthy mucosa and a growth in the right lower bronchus; however, a biopsy that was attempted did not yield diagnostic material. No lesions were noted on endoscopic examination of the gastrointestinal tract. The CA-125 and carcinoembryonic antigen (CEA) levels were elevated.

The fine needle aspiration cytology of the right supraclavicular lymph node showed features of a metastatic adenocarcinoma. The patient underwent a total abdominal hysterectomy with bilateral salphingo-oophorectomy and omentectomy.

Per-operative examination showed enlarged, irregular ovaries replaced by a tumor with adhesions to the mesentery, peritoneal surface of the urinary bladder and pelvis. The under surface of the diaphragm and peritoneum were free. A lesion was noted on the anterior aspect of the left

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Fig. 1 Metastatic adenocarcinoma in the ovary: ovarian stroma with an infiltrating adenocarcinoma (a; original magnification, $\times 100$, H&E), glandular features of the tumor (b; original magnification, $\times 400$, H&E), strong cytoplasmic staining of CK7 and inset showing

negative staining with CK20 (c; original magnification, $\times 40$ & $\times 100$, respectively), and strong nuclear staining of TTF1 in the neoplastic cells (D; original magnification, $\times 200$)

lobe of the liver. Minimal free fluid was noted in the peritoneal cavity.

On gross examination, the right and left ovary measured 17 and 4.5 cms, respectively, in the greatest dimension with partly solid and partly cystic cut surface along with mucinous areas. Histopathological examination of both the ovaries showed a moderately differentiated adenocarcinoma with mucinous component (Fig. 1a, b).

In view of the clinical features and bilateral ovarian involvement, a metastatic tumor was considered and immunohistochemical examination was done to differentiate from a primary ovarian tumor. The immunohistochemical markers included CK7, CK20, and TTF-1. The neoplastic cells showed a cytoplasmic positivity for CK7 and a negative staining with CK20 (Fig. 1c) and nuclear positivity for Thyroid Transcription Factor1 (TTF-1) (Fig. 1d). The co-expression of CK7 and TTF1 is strongly suggestive of a primary lung carcinoma metastasizing to the ovaries.

Discussion

Ovarian metastasis from non-genital tract tumors is a common finding. The Krukenberg tumor from gastric

carcinomas and other sites is a classic example [1]. Ovarian metastasis of primary lung tumors is fairly uncommon, accounting for 2–5 % of cases in a large autopsy series. These present in the setting of a previously diagnosed pulmonary malignancy with a time interval of up to 2 years [3]. Occasionally, the metastatic tumor presents synchronously or before the diagnosis of the primary tumor as seen in our case. Though the bilateral ovarian involvement with irregular external surface of the ovaries suggests a metastatic tumor, a microscopy of mucinous adenocarcinoma causes a diagnostic dilemma of primary versus metastatic tumor with significant therapeutic and prognostic implications. In such situations, immunohistochemistry (IHC) plays an important role in determining the histogenesis. The presence of hilar growth in the bronchus with multiple bony lesions and liver metastasis radiologically and no peritoneal disease at surgery supported a diagnosis of metastasis. Further, the IHC profile of CK7 and TTF-1, a marker with high specificity and sensitivity for lung adenocarcinoma, clinched the diagnosis of metastatic lung adenocarcinoma to the ovaries. A monoclonal antibody to thyroid transcription factor 1 (TTF-1), which is a protein mediating thyroid-specific transcription of thyroglobin, is expressed in bronchioloalveolar epithelia along with thyroid and

diencephalon. The sensitivity and specificity of TTF-1 for lung adenocarcinoma have been demonstrated as 76 and 100 %, respectively.

Therefore, awareness of the frequency of ovarian metastasis, a detailed clinical history, a thorough clinical and operative search, a careful evaluation at histopathology, and judicious use of IHC will aid in arriving at the right diagnosis and avoid adverse consequences for the patient.

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