Cerebral Metastases as First Clinical Manifestation of Ovarian/Fallopian Tube Carcinoma

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Received: November 21, 2018; Published: December 03, 2018

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Abstract

Cerebral metastases from ovarian/fallopian tube carcinoma, rare and highly dismal events, develop usually in patients with prolonged survival. There are only several reports on cancers in which brain involvements are present before or at the time of diagnosis of primary ovarian/fallopian tube carcinoma. Therefore we attempted to systemically review available evidence on brain metastasis as a first manifestation of ovarian/fallopian tube carcinomas. Consideration of the brain as a potential site of metastasis even early in the primary lesion may lead us to consider the occult ovarian/fallopian tube carcinoma in females affected by brain involvements.

Keywords: Ovarian Carcinoma; Fallopian Tube Carcinoma; Brain Metastasis; First Clinical Manifestation; Occult Primary Tumor

Introduction

Recent knowledge on histopathology and genetics have induced a paradigm shift that peritoneal, ovarian and fallopian tube carcinomas are considered as a spectrum of disease originating from the Müllerian duct remnant [1,2]. Intraperitoneal dissemination is the most commonly encountered pattern and initial distant metastasis beyond the liver or lung, including brain, is very rare [3]. Central nervous system involvement occurs as a late manifestation of the disease developing after the initial diagnosis of primary tumor; less than 5% are of the carcinoma [4-6]. The multimodal treatment with a combination of surgery, chemotherapy and radiotherapy may improve survival but also increase the incidence of brain metastases [4-6]. Diagnosis of brain metastases which precede the diagnosis of ovarian/fallopian tube origin rarely occurs. In such cases, the carcinoma may be remarkable for the small size of the occult primary tumor and the early metastatic spread to the brain, which is ultimately responsible for the patient’s presenting symptoms. Considering the brain as a potential site of metastasis even early in the primary lesion may give a new insight to identify the factors, both host and tumor based, that could make the brain prone to metastasis so early in the disease process.

Literature Review

In a literature review we found 5 single case reports in which brain metastases were present on initial presentation of ovarian/fallopian tube carcinomas before or at the time of diagnosis of primary ovarian/fallopian tube carcinomas (Table 1). The poorly differentiated adenocarcinoma accounts for 40%, and the characterized as endometrioid adenocarcinoma, clear cell carcinoma and serous adenocarcinoma only 1 one case. Metastases prefer the parenchyma rather than the leptomeninges in all cases as previously reported [7,8], usually as a single lesion [9-11], but also multiple in 2 cases [7,12].

Table 1: Brain metastases as first clinical manifestation of fallopian and ovarian carcinoma.

<table>
<thead>
<tr>
<th>Authors, Year</th>
<th>Age (Years)</th>
<th>Histology</th>
<th>Local Findings in Primary Site</th>
<th>Single or Multiple Lesion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matsunami et al [10]</td>
<td>36</td>
<td>Endometrioid Adenocarcinoma, Ovary</td>
<td>Corresponding to stage IA</td>
<td>Single</td>
</tr>
<tr>
<td>Raff et al. [11]</td>
<td>63</td>
<td>Poorly Differentiated Adenocarcinoma, Fallopian Tube</td>
<td>Corresponding to stage IC, (positive pelvic washing cytologic examination)</td>
<td>Single</td>
</tr>
<tr>
<td>Al Barbarawi et al. [12]</td>
<td>41</td>
<td>Clear Cell Carcinoma, Ovary</td>
<td>Corresponding to stage IA</td>
<td>Multiple</td>
</tr>
</tbody>
</table>
Comments

Upon analyzing 12 previous articles on the clinical course of brain involvement in patients without a known primary tumor [13-24], 60-70% of total patients eventually had a primary cancer identified. The most commonly identified source was lung cancer. Other frequently discovered primary tumors include gastrointestinal tumors and melanoma, in approximately 10 to 15% of cases. Primary origin cancers remained unidentified in approximately 30% of all cases; ovarian/fallopian tube carcinoma was not mentioned in these articles. Brain metastasis may occur via the unique cerebrosplinal venous system named as Batson's plexus. This system consists of veins, sinuses and venous plexuses [25], communicating with the veins around the spinal column, the segmental veins of thoracoabdominal wall, the plexuses and the azygous system of veins of pelvic organ. The main characteristics of the Batson plexus is lack of venous valves. This lack of valves causes bidirectional blood flow, and it may play as a route for rostral metastatic spread of tumor, infection or emboli from pelvic organs [26,27].

The lack of spread into the pelvic, infraabdominal or thoracic organs except for local lymph node metastasis suggests that the brain metastases probably occurred by tumor cell dissemination hematogenous through the Batson plexus. Ovarian/fallopian tube carcinoma is common but metastasizes rarely to the brain. The brain involvement is traditionally considered as a late manifestation of the diseases and generally occur in patients with prolonged survival. The metastatic brain involvement of brain as early presentation of ovarian/fallopian tube carcinoma is extremely unusual, but we suggest the importance of considering the brain as a potential site of metastasis, even early in the disease course of ovarian/fallopian tube carcinoma. There is some evidence that patients with only solitary brain metastases may have an improved prognosis. The possibility of the occult ovarian/fallopian tube carcinoma should be always considered in females with brain involvements.

References

