Choroidal melanoma metastasized to the ovary: case report and review of the literature

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Introduction

Melanoma is a malignant neoplasm of neuroectodermal origin characterized by melanin production that usually affects the skin, adrenal glands and ocular choroid. It is characterized by clinical variability and unpredictable biological behavior with long remissions and relapses that develop rapidly. Metastases to the lungs and liver are the most common cause of death.

Malignant melanoma (MM) accounts for only 3% of cancers that affect female patients and results in less than 1% of cancer deaths [1]. However, in recent years its incidence has been increasing. Primary MM of the reproductive tract usually arises from the vulva (3-7% of MM) [2, 3], secondary or primary melanomas of the upper genital tract are very rare [4].

To the best of our knowledge, only seven cases of ovarian metastasis from previous choroidal melanoma have been reported in the literature. Patients affected by CMM ranged in age from 38 to 83 years (median 51.2 years), the time to relapse ranged from 3-25 years (median 51.2 years), the size of the cysts ranged from 4-17 cm (median 9.7 cm) and the survival period ranged from 2-14 months (median 8.1 months).

In this report we present the eighth case of choroidal metastatic melanoma (CMM) of the ovary treated at our department describing the clinical aspects and histopathological features, while discussing the differential diagnosis of MM affecting the ovary.

Case Report

Clinical history

A 57-year-old postmenopausal woman was admitted for hypogastric pain and weight loss (5 kg in 1 month). Her history was characterized by enucleation of the right eye six years before for malignant choroid melanoma. Gynaecological examination revealed enlarged ovaries. Bilateral salpingo-oophorectomy, hysterectomy, and omentectomy were performed. Final pathology diagnosed a choroidal metastatic melanoma (CMM). The patient died seven months later.

Clinical methodology and findings

The resected lesion was fixed in 10% buffered formalin and multiple extensively sampled sections were then routinely embedded in paraffin and stained with hematoxylin and eosin (Figures 1-2). Cytoreduction procedures were total abdominal hysterectomy with bilateral salpingo-oophorectomy and total omentectomy.
Pathological findings

Final pathology diagnosed metastases of CMM in both ovaries and the omentum. Diagnostic esophagogastroscopy and a transabdominal US examination confirmed the metastatic involvement of the stomach and pancreas.

Histological findings

The left ovary, measuring 4 cm, had a smooth surface and showed cystic lesions filled with a clear fluid and showing a smooth surface with dark spots (Figure 3). The right ovary showed small multilocular cystic lesions, 2 mm in diameter, filled with clear fluid and with a smooth internal and external surface. Microscopic examination revealed bilateral serous cystadenofibroma and metastases of CMM.

The omental sample showed an enlargement of 1 cm and two smaller dark blue areas of 0.5 mm; the cut surface revealed a slightly nodulated, black tumor. Microscopic investigation diagnosed metastases of CMM.

Discussion

Involvement of the female genital tract from extragenital cancers is uncommon. The most common extragenital cancers metastasizing to the female genital tract are breast and gastrointestinal carcinomas [12]. Malignant cutaneous melanoma accounts for only 2.5% of cases metastasizing to the female genital tract and the ovaries are most often affected (75-80% of the cases) [13].

The rarest melanoma metastasizing to the ovary is choroid melanoma. To our knowledge only seven cases have been completely described in the literature [5-11] (Table 1).

Ocular melanoma presents an incidence in the general population ranging from 0.5-1 per 100,000 [10, 14, 15], 50% of patients die in 15 years [12, 10], and 20% metases occur within five years [16]. It has a latent progression with metachronous metastasis up to 42 years from the first diagnosis [17].
Although occult metastasis to the ovary from a primary MM has been reported in up to 18% of women in autopsy studies [18], symptomatic MM is very rare.

It is predominantly diagnosed in women in reproductive age (80%) (average age 35 years), usually unilateral and associated with a poor prognosis [19]. Women of reproductive age may be more prone to metastatic ovarian involvement because the higher blood flow to the premenopausal ovary [20]. The recurrences often occur after a long period of remission (10 years after the initial diagnosis), probably because female hormones might influence the natural history of melanoma [18]. Also, clomiphene has been suspected of increasing the risk of ovarian metastatic melanoma but data have not been able to support this hypothesis [21].

Preoperative diagnosis of ovarian MM presents some difficulties, and usually the diagnosis is made retrospectively after laparotomy.

Similarly to ovarian MM, also CMM can present as a solitary ovarian metastasis [8, 9, 22], or as in the present case as widespread disease [5-7, 10, 11].

Most metastatic tumors involve both ovaries, conversely, ovarian metastases from melanoma are mostly unilateral [19]. On the contrary, Thiery et al. [7] reported a CMM involving both ovaries, as in the present case (Table 1).

Our patient showed diffuse intraabdominal metastatic disease six years after the initial surgery of the primary choroid melanoma even though serum levels of tumor markers were within the normal range.

US examination did not discriminate the ovarian mass; in fact in our case, as reported in the literature, ovarian metastases at US examination presented with images similar to those of primary tumors, multilocular masses and without typical findings that can differentiate them [23]. Magnetic resonance imaging could characterize the lesion only in the presence of a conspicuous amount of melanin which causes a peripheral high signal change on T1-weighted images (in contrast to central increases of activity in dermoids and endometriomas), which happens only in one-third of patients [14, 24].

However, when a relapsed melanoma is suspected a positron emission tomography (PET) scan should be performed to detect subclinical metastases and to stage the disease [25].

Melanoma of the ovary represents diagnostic difficulties because the tumors do not have a consistent appearance, and on histology they can be mistaken for germ cell and sex cord stromal tumors [19, 26, 27]. Steroid cell tumors in particular show as abundant eosinophilic cytoplasm as melanomas but they are usually not as mitotically active as melanomas. Although steroid cell tumors may contain lipofuscin pigment, teratomatous elements (primary melanoma), spindle cells and melanin pigment are supportive of melanoma [26]. Moreover immunohistochemistry using melanocytic and sex cord-stromal

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**Table 1. — Characteristics of the patients with ovarian metastasis from previous choroidal melanoma.**

<table>
<thead>
<tr>
<th>Author</th>
<th>Age</th>
<th>Primary Symptoms</th>
<th>Ovarian</th>
<th>Other</th>
<th>Imaging</th>
<th>Tumor</th>
<th>IHC</th>
<th>Treatment</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dawson et al.</td>
<td>38</td>
<td>Right eye</td>
<td>Pelvic mass</td>
<td>Left ovary</td>
<td>Right arm</td>
<td>–</td>
<td>–</td>
<td>BSO</td>
<td>NED (9 mo)</td>
</tr>
<tr>
<td>Ben David et al.</td>
<td>62</td>
<td>Left eye</td>
<td>Vaginal bleeding</td>
<td>Left ovary</td>
<td>Omentum small and large bowel</td>
<td>Semisolid pelvic tumor (USG)</td>
<td>–</td>
<td>TAH+ BSO+</td>
<td>CX</td>
</tr>
<tr>
<td>Thiery et al.</td>
<td>35</td>
<td>Right eye</td>
<td>Vomiting, diarrhea, weight loss, abdominal swelling</td>
<td>Both ovaries</td>
<td>–</td>
<td>–</td>
<td>BSO</td>
<td>CX DOD (8 mo)</td>
<td></td>
</tr>
<tr>
<td>Santesuano et al.</td>
<td>47</td>
<td>Right eye</td>
<td>Pelvic pain</td>
<td>Right ovary</td>
<td>No other site</td>
<td>Right adnexal mass (USG)</td>
<td>NR</td>
<td>S-100 HMB-45 MART1 vimentin Ki 67 (&lt;10%)</td>
<td>TAH+BSO+ appendectomy (14 mo)</td>
</tr>
<tr>
<td>Rey-Caballero et al.</td>
<td>38</td>
<td>Left eye</td>
<td>Hypo gastric pain vaginal spotting</td>
<td>Left ovary</td>
<td>No other site</td>
<td>Round solid mass in Douglas</td>
<td>–</td>
<td>–</td>
<td>Interferon (7 mo) DOD (2 mo)</td>
</tr>
<tr>
<td>Couts et al.</td>
<td>83</td>
<td>Left eye</td>
<td>Vaginal bleeding</td>
<td>Right ovary</td>
<td>Systemic widespread (3 y)</td>
<td>–</td>
<td>–</td>
<td>Palliative care</td>
<td></td>
</tr>
<tr>
<td>Bloch-Marquette et al.</td>
<td>50</td>
<td>Left eye</td>
<td>Abdominal pain</td>
<td>Right ovary</td>
<td>Liver</td>
<td>Heterogeneous Ovarian soft tissue (CT)</td>
<td>Melanin A HMB-45</td>
<td>Laparoscopic ovariectomy CX (2-5 mo)</td>
<td></td>
</tr>
<tr>
<td>Index case</td>
<td>57</td>
<td>Right eye</td>
<td>Hypo gastric pain body weight loss (5 kg in 1 mo)</td>
<td>Both ovaries</td>
<td>Abdominal pelvic (6 y)</td>
<td>–</td>
<td>–</td>
<td>TAH+BSO+ omental sampling</td>
<td></td>
</tr>
</tbody>
</table>

TAH: total abdominal hysterectomy; BSO: bilateral salpingo-oophorectomy; OM: omentectomy; LFN: lymphadenectomy; Y: years; Mo: months. NR: normal range; USG: ultrasonography; CT: computer tomography; NR: normal range; IHC: immunochemistry; CX: chemotherapy; NED: no evidence of disease; DOD: died of disease.
markers, such as inhibin and calretinin [28], is likely to be useful, but ovarian sex cord stromal neoplasms and steroid cell tumors are not uncommonly positive with some melanocytic markers, including S-100 and melan-A [29-30]. MM of the ovary rarely shows positivity for inhibin or calretinin [31]. On the contrary, the most specific melanocytic marker HMB 45 may occasionally be positive in ovarian steroid cell tumors [29]. In our cases the diagnosis was made only after laparotomy because of a typical picture of metastatic melanoma of macroscopic and microscopic findings (Figures 1-3).

The diagnosis of primary ovarian MM requires the absence of a primary extragranarian tumor, the detection of an unilateral ovarian tumor with teratoid elements, historical evidence of melanocyte junctional activity, and a good correlation of patient age and symptoms with the cases reported in the literature [26].

The principal treatment is surgery ranging from an ovarian cystectomy to extensive debulking. Medical therapy consists of chemotherapy and immunotherapy. Cisplatin and dacarbazine are the most effective drugs used in patients with persistent or recurrent disease, whereas alfa-interferon and interleukin-1 are promising in metastatic melanoma [15, 32-34].

Even if surgery and use of cisplatin-based chemotherapy appear to improve the outcome, the total response rates of melanoma to adjuvant chemotherapy remain within range of only 20%, with a complete response rate of less than 10% [35].

Hence, several combined therapeutic strategies are commonly adopted because CMM mimics primary ovarian cancer and leads to unnecessary aggressive cytoreductive surgery (Table 1). Secondary ovarian involvement should be diagnosed preoperatively to avoid over-treatment and to provide adequate palliative therapy.

In conclusion, melanomas of the ovary are very rare and very ominous. It is important for the gynecologist to suspect melanoma of the ovary when a patient with a history of a previous malignant melanoma (cutaneous, mucosal) has symptoms such as bleeding, pain, swelling, and abdominal mass.

Malignant melanoma of the ovary represents several diagnostic problems. It is often misdiagnosed because of non discriminatory symptoms, normal levels of tumor markers, non characteristic imaging findings and the capacity to mimic other tumors. Furthermore, in cases of CMM, because of its latency, the diagnosis of metastasis from a melanoma is difficult because the patient may have been in remission for many years or because the antecedent is unknown. Although the first case of choroidal metastatic melanoma of the ovary was described in 1922 [5], CMM still today represents a challenge for gynecologic oncoplogists.

Acknowledgments

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References

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