Pure yolk sac tumor of ovary in an adult: a rare occurrence

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Summary

Background: Malignant ovarian germ cell tumors are relatively rare, making up less than 2-3 % of all ovarian malignancies. However, although they represent only a small fraction, they frequently affect young women of reproductive age. Malignant germ cell tumors are subdivided into dysgerminoma and non-dysgerminomatous tumors. The most common types of non-dysgerminomatous tumors are yolk sac tumors (YSTs). Case Report: The authors present a case report of a 32-year-old woman with a history of gradual abdominal distention and an increased serum level of alpha-fetoprotein (AFP). She was diagnosed with a pure YST after removing her left ovary. Then, she was subsequently treated with adjuvant chemotherapy by four cycles of bleomycin, etoposide, and cisplatin after fertility-sparing surgery. Conclusion: This case report shows that older patients could have this tumor with no associated tumor.

Key words: Yolk sac tumor; Endodermal sinus tumor; Ovarian cancer.

Introduction

Yolk sac tumors (YSTs) of the ovary, also known as endodermal sinus tumors, are the second most common malignant ovarian germ cell tumors (MOGCTs), after dysgerminomas for about 20 % [1]. It is representing about 1% of all ovarian malignancies [2]. In USA, the age-adjusted incidence rate per 100,000 women is 0.048 [1]. YSTs are highly malignant tumors and occur primarily in children and young adults. Median age of diagnosis varies from 19 to 22 years, in contrast to perimenopausal or post-menopausal age associated with ovarian epithelial cancer [3]. The authors present a case report of a 32-year-old woman diagnosed with YST end of July 2017, nine months after giving birth. The patient was operated and subsequently treated with adjuvant chemotherapy with four cycles of bleomycin, etoposide, and cisplatin (BEP).

Case Report

A 32-year-old woman presented with a history of gradual abdominal distention that had started few weeks before. She gave birth full term pregnancy in September 2016. She had no medical history except for a laparoscopy for a left ovarian hemorrhagic cyst during the first trimester of the pregnancy.

The patient was in a good general condition (BMI = 23.5 Kg/m²) and there was a family history of breast carcinoma in her mother, grandmother, and maternal aunt. On July 20th, 2017, the clinical examination detected a mass ascending of four centimeters above the umbilicus. The gynecological examination found no anomaly of the cervix. The uterus was mobile. However, the lesion was posterior and not mobilizable, including the rectal examination. There was no invasion of the rectum. Serum level of alpha-fetoprotein (AFP) was raised to 47,505 ng/ml on July 25th, 2017. These results were followed by a thoraco-abdomino-pelvic CT scan and MRI. They revealed a large heterogeneous pelvic mass (146×110×102 mm) with septations pushing the neighboring organs and no sign of infiltration. Moreover, mild ascites suggested peritoneal carcinosis, without signs of hepatic and pulmonary metastasis (Figures 1 to 3).

Exploratory laparotomy on July 26th, 2017 revealed mild ascites and a mass depending on the left ovary with the Douglas adhering to it. There were no peritoneal lesions. The right ovary, fallopian tube, and uterus were normal. The patient underwent surgical removal of the left ovary and partial removal of the Douglas. The cytology examination of peritoneal washing was malignancy negative. The ovarian stroma was remodeled by a proliferation of cells arranged in a reticular architecture, and the presence of cells around cavities. The cells form clusters were sometimes centered by vessels. The immunohistochemical study showed that the neoplastic cells marked the AFP and the cytokeratin AE1/AE3. Some cells marked the PLAPs. They were negative for CD30, calretinin, alpha inhibin and beta-hCG (Figures 4 to 7). All of these elements revealed an YST with no other associated tumor. After the surgical tumor removal, the patient had a transvaginal oocyte retrieval to preserve fertility on September 11th, 2017. She underwent four cycles of adjuvant chemotherapy with BEP between September and December 2017 because AFP did not standardize after surgery (216 ng/mL). AFP was standardized after the second cycle on October 30th, 2017. On March 26th, 2018, AFP was normal (1.1 ng/mL) and a thoraco-abdomino-pelvic CT did not find recurrence.

Discussion

Ovarian germ cell tumors (OGCTs) constitute 15% to 20% of all the ovarian tumors [4]. They originate from the primitive germ cell and gradually differentiate to mimic tis-
sues of either the embryonic origin like ectoderm, endoderm and mesoderm or the extraembryonic tissues like the yolk sac and trophoblast. OGCTs are subdivided into germinomatous and non-germinomatous tumors [2, 5]. The specific type of tumor depends on the degree of differentiation. A germinoma would develop if there is no differentiation, whereas embryonal carcinoma would develop with differentiation and with extraembryonic differentiation, a yolk sac tumour or a choriocarcinoma [3]. MOGCTs are rare, accounting for approximately 2-3% of all the ovarian malignancies [6]. YSTs, though rare, 1% of all ovarian malignancies [2] are the second commonest histopathological subtype of MOGCTs after dysgerminoma and account for about 20% [1]. Yolk sac tumor is usually seen in children and young adults [4, 7].

Clinical symptoms include an enlarging pelvic mass which extends to the abdomen which is associated with pain, and abdominal distension [2]. Fever, dyspnea, increased body weight, and vaginal bleeding may occasionally be observed. Sometimes, patients have no symptoms and are diagnosed incidentally. Ascites, or peritonitis secondary to torsion, infection, or rupture of the ovarian tumor, are other possible clinical features [2, 4-6]. The duration of the symptoms range from two days to six months, with a
median duration of four weeks [4]. The tumor is almost always unilateral and the median diameter is around 17 cm [5]. Often there is rapid growth with extensive intra-abdominal spread leading to poor prognosis [5].

High values of AFP orientate strongly to diagnosis of YST. Furthermore it is a sensible marker for tumor’s evolution. Indeed a rapid decrease of AFP levels in the serum after surgery is a sign of absence of residual tumor. The efficiency of chemotherapy is also related with AFP normalization [2, 5, 8-10].

In 2014, the largest cohort of radiological studies of ovarian YSTs found that YSTs are often seen large, well-circumscribed, solid-cystic masses with intratumoral hemorrhage, marked heterogeneous enhancement, and enlarged intratumoral vessels on CT images [11]. However, pre-operative diagnosis is difficult, as yolk sac tumors do not have a specific radiological image.

The malignant evolution of YST consists in locoregional extension involving uterus, pelvic peritoneum, rectum, and bladder. Other authors described the involvement of the omentum, abdominal peritoneum, and serosal surfaces of bowel in 30% of the cases. In advanced stages, retroperitoneal lymph nodes and liver parenchyma are also involved [2].

The diagnosis is histopathological. Histologically the malignant tissue could have Schiller-Duval bodies, which are present in approximately 50% of these tumors, and if they are found, it is pathognomonic. It consists of a central vessel surrounded by tumor cells with a reticular pattern.

Ovarian YSTs are rare malignant ovarian tumors that occur in young age. Because of that, the treatment strategy should ideally be directed to long-term survival and fertility preservation. The standard management of malignant ovarian germ cell tumors is complete surgical excision followed by adjuvant chemotherapy [2, 5]. Fertility-sparing surgery is often possible, as the tumors are unilateral [5]. Thus, even in patients with bulky metastases, a normal appearing uterus and contralateral ovary can be safely preserved allowing for future fertility [12]. However, it is recommended that patients with bulky disease in the abdomen, pelvis, and retroperitoneum should be surgically cytoreduced to optimal residual disease if possible [12].

The BEP chemotherapeutic regimen has proved to be efficient in treating MOGCTs since its introduction in the 1980s [12]. The use of BEP in combination with fertility preservative surgical techniques has dramatically improved survival combining with fertility preservation in women diagnosed with YST [13]. Four cycles of BEP are recommended. Thus cycles of chemotherapy should be administer while monitoring the rate of serum AFP decline [2].

Toxicities such as hair loss, fatigue, nausea, and myelosuppression have been reported with BEP regimen [12]. Cisplatin is known to be associated with nerve damage manifesting as peripheral neuropathy or hearing loss [12]. A potentially fatal side effect of this regimen is bleomycin.
It induced pulmonary fibrosis, making it mandatory for patients to have pulmonary function testing before treatment to document baseline function and allow for surveillance of function during therapy [12]. In addition to that, we have to pay attention for secondary malignancy related to etoposide in the form of acute myelogenous leukemia, related to cumulative dose effect [12]. Yet, these toxicities are relatively uncommon when they occur due to the short duration of treatment, which is only four cycles [12]. Though there is a risk of infertility following chemotherapy, even if the majority of patients maintain their ovarian function and fertility [5]. Factors related to good prognosis are no ascites at presentation, Stage I disease, less than 42 days to AFP normalization, fertility-sparing surgery, and a serum AFP half-life less than ten days [5]. Progressive or recurrent ovarian tumor after treatment with BEP chemotherapy has been reported to be associated with a poor prognosis [5].

An analysis of the National Cancer Data Base was published in 2017 about management and prognosis of ovarian YSTs. They found that five-year overall survival (OS) for Stage I, II, III, and IV disease were 94.8%, 97.1%, 70.9%, and 51.6%, respectively. Statistical significant better five-year OS was observed for adolescents (94.4%) and young adults (89.3%) compared to older premenopausal (67.6%) and post-menopausal women (30.6%), respectively. Moreover, omentectomy, hysterectomy, and lymph node sampling/dissection (LND) were not associated with better OS. Women who received adjuvant chemotherapy had superior OS compared to those who did not. Early disease stage, younger age, and receipt of adjuvant chemotherapy, but not LND were independently associated with better mortality [14].

As regards the follow-up of chemotherapy, the determination of initially elevated markers (AFP) should be repeated before each cycle of therapy, soon after the end of the treatment, every three months the first two years, then every six months from the third to the fifth year, and once a year after the end of chemotherapy [2, 6, 13]. An annual clinical examination and a pelvic ultrasound is necessary in the case of conservative treatment, to screen for a contralateral recurrence [15].

Conclusion

YSTs of the ovary are rare, highly malignant tumors, and occur primarily in children and young adults. This case report showed that older patient could have this tumor with no associated tumor. Histological study showed typical pattern with Schiller-Duval bodies marked by the AFP in the immunohistochemical study. Surgical removal of this tumor was made, followed by four cycles of adjuvant chemotherapy.

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References


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