International Journal of Medical & Clinical Imaging
IJMCI, 4(2): 69-72
www.scitcentral.com
ISSN: 2573-1084
Case Report: Open Access

Malignant Ovarian Germ Cell Tumor - A Rare Combination of Yolk Sac Tumor and Immature Teratoma

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Received September 09, 2019; Accepted October 12, 2019; Published October 27, 2019

ABSTRACT

Malignant mixed germ cell tumor is a type of tumor that consists of two or more germ cell tumor components. Most common combination reported is dysgerminoma and Endodermal sinus tumor. These tumors can occur in women at any age, but peak incidence is seen during the early 20's. This is a case report of an 18 year old girl with a 5 kg intra-abdominal left ovarian tumor. These tumors show elevated levels of either alpha fetoprotein or beta hcg or both. These tumors are chemosensitive and hence should be given chemotherapy following surgery.

Keywords: Yolk sac tumor, Immature teratoma, Mixed germ cell tumor

INTRODUCTION

Malignant mixed germ cell tumor has two or more germ cell tumor components. Ovarian germ cell tumor occurs most commonly in first two decades of life and accounts for about 15 to 20% of all ovarian neoplasms. Ovarian Malignant germ cell tumor contributes to less than 5% which include dysgerminoma, immature teratoma, yolk sac tumor, mixed germ cell tumor [1]. Malignant Mixed germ cell tumor represents only less than 1% of all ovarian germ cell tumors. Most common combination reported is dysgerminoma and Endodermal sinus tumor [2].

CASE REPORT

A 18 year old girl presented to surgical outpatient department with the chief complaints of abdominal distention and pain for four months duration. She complained of loss of weight and loss of appetite. Her menstrual history revealed that she attained menarche at the age of 12 with irregular cycles and oligomenorrhea. There was no history of malignancies in the family.

Examination of the abdomen revealed a 30 × 40 cm mobile mass, that didn't move with respiration, arising from the pelvis. The mass occupied all quadrants of the abdomen and had variable consistency. Ultrasonogram of the abdomen revealed a huge abdomino-pelvic mass with solid and cystic components with non visualised left ovary and normal looking right ovary. There was no evidence of free fluid in the abdomen. The contrast enhanced CT **(Figure 1)** showed heterogeneously enhancing multiloculated solid-cystic mass lesion in the left adnexa (13.7 × 20.9 × 23.5 cm). The cystic area was multiloculated with enhancing thin septations with multiple central and eccentric calcification and peripheral enhancing thin margins. Tumor markers levels were elevated (CA-125 – 265 U/ml (N<35 U/ml), alphafetoprotein (AFP) – 520 ng/ml (N<7.51 g/ml), human chorionic gonadotropin (hcG) 2.39 ml IU/ml (Pregancy positive>25 ml U/ml)).

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Citation: Zareena S, Bharat N, Kumar ACS, Vardhini RH & Rekha A. (2019) Malignant Ovarian Germ Cell Tumor - A Rare Combination of Yolk Sac Tumor and Immature Teratoma. Int J Med Clin Imaging, 4(2): 69-72.

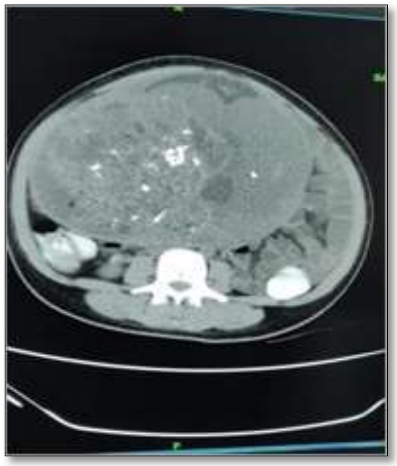

Figure 1. CT showing pelvic mass.

A final diagnosis of a malignant ovarian mass was made based on clinical examination, imaging studies and tumor markers. Patient underwent fertility sparing staging laparotomy, where 5 kg ovarian tumor was removed including left Fallopian tube **(Figure 2)**. Surgery included unilateral oopherectomy, peritoneal washing, omental biopsy and selective removal of enlarged lymph nodes. There was no free fluid in the abdominal cavity and peritoneal washing were taken and was sent fluid analysis which revealed presence of malignant cells. Abdominal cavity was explored and there was no evidence of malignant disease elsewhere. Right ovary and uterus was normal looking. Tumor was removed, infracolic omentectomy, pelvic and para-aortic lymphadenectomy was done for staging of the tumor. Frozen section was sent which showed malignant germ cell with yolk sac tumor and teratoma with presence of stromal necrosis.

Figure 2. Gross tumor.

Histopathology showed germ cell origin of ovarian tumor. The predominant component was yolk sac tumor **(Figure 3)** showing microcystic areas with Schiller Duvall bodies and the presence of neuroectodermal cells suggestive of immature teratoma **(Figure 4)**. Two out of the twelve para-aortic lymph node were involved. Final histopathological diagnosis was malignant mixed germ cell tumor of ovary- Yolk sac tumor (60%) and immature teratoma- Grade 2 (40%) with FIGO stage III A1 (II).

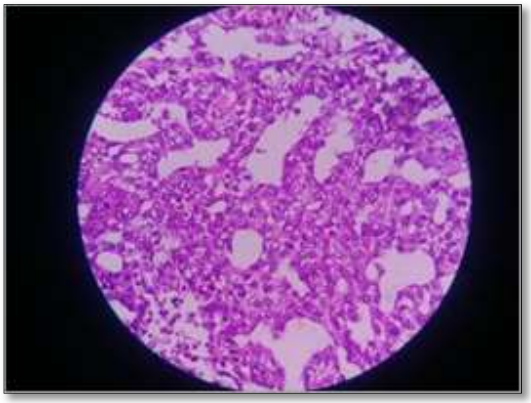

Figure 3. Yolk sac tumor.

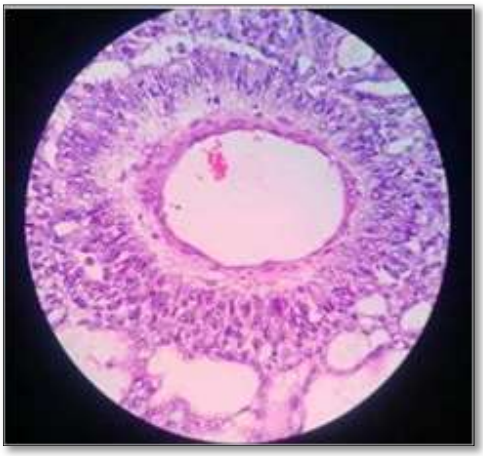

Figure 4. Immature teratoma (grade 2).

Patient received four cycles of bleomycin, etoposide and cisplatin combination chemotherapy. Patient is doing well at 6 months follow up.

DISCUSSION

Ovarian tumors can occur in women at any age, but peak incidence is seen during the early 20's. In children and adolescents, more than 60% of ovarian neoplasms are of germ cell origin, of which approximately 1/3 are malignant [3]. Dysgerminoma is the most common germ cell tumor, accounting for 50% of all germ cell tumor cases [3]. The yolk sac tumor (also known as endodermal sinus tumor) is the second most common germ cell tumor and is common in girls with an average of 19 years [3]. Less common tumors are embryonal carcinoma, immature

teratoma, choriocarcinoma, polyembryomoas and mixed germ cell tumors.

These tumors are usually unilateral; however 10-15% pure dysgerminomas are bilateral [3]. In our case, the combination was yolk sac tumor and immature teratoma. A large number of malignant elements, such as yolk sac tumor and high grade immature teratoma are often associated with more aggressive behavior [4]. The definition of large ovarian mass varies from those measuring more than 10 cm in diameter in preoperative scans to those reaching above umbilicus [5]. Immature teratoma are typically (14-25 cm) larger than mature cystic teratoma.

Clinically, most patients present with abdominal distension and pelvic pain. About 10% of patient presents with acute abdominal pain due to rupture, hemorrhage or torsion of the ovarian mass [3]. Definite diagnosis of the tumor can only be made by histopathology. Ultrasonography or CT is done to delineate the size and to determine the complexity of tumors [1]. Mixed lesions may secrete either hcG, alpha fetoprotein or both or neither of these markers, depending on the components. The Current Royal College of Obstetricians and Gynecologist Green-top Guideline for ovarian masses recommends determination of serum Lactate Dehydrogenase (LDH), alpha fetoprotein and hcG in all women aged under 40 years [6]. These tumors require urgent evaluation and treatment as the disease progress rapidly with short tumor doubling time and spread to the peritoneum, lungs, liver and brain. Metastatic disease has a higher probability of drug resistance and life threatening complications including intratumoral hemorrhage. Immunohistochemistry help in the diagnosis and development of new management modalities [7,8].

The prognosis of germ cell tumor and sex cord ovarian tumor is much better than epithelial ovarian cancer. Large tumor size, unfavorable histological type and advanced stage at presentation are the poor prognostic factors. These tumors has good prognosis because of higher number of diagnosis at early stages and due to high chemosensitivity [9]. Mahdi et al. [10] showed that presence of lymph node metastasis had no adverse effect on long term outcome.

The standard treatment regimen for MOGCT with fertility desiring is Fertility sparing surgery [11]. That is preservation of uterus and contralateral ovary with staging procedure. Comprehensive staging can be omitted for young patients with early stage of the disease. Zanetta et al. [12] revealed that it is possible to restore normal gonadal function and fertility after conservative surgery [12].

All patients except those with FIGO stage 1a require combination therapy. Usually combination chemotherapy contains bleomycin, etoposide and cisplatin (BEP) or vincristine, dactinomycin and cylophosphamide (VAC), wherein three cycles for completely resected disease and four cycle for macroscopic residual disease. Cisplatin is replaced by carboplatin in women with renal function abnormalities. Excellent therapy has been reported with reported with adjuvant BEP therapy. Second look surgery or removal of lesion is indicated in case of recurrence of tumor. A study conducted by Ertas et al. [13] showed that fertility rates were higher for those who received adjuvant chemotherapy after fertility sparing surgery. The POMB/ACE regimen (cisplatin, vincristine, methotrexate and bleomycin (POMB) alternating with actinomycin D, cyclophosphamide and etoposide (ACE) was designed to reduce risk of drug resistance [14]. About 75% of MOGCT recurrences occur within first year, so follow up every 4-8 weeks [15]. Follow up should include tumor markers, chest X-ray and CT imaging after 3 months of therapy.

CONCLUSION

Malignant mixed germ tumor of ovary with components of yolk sac tumor and high grade immature teratoma are extremely rare and highly aggressive. Fertility sparing surgery with adjuvant chemotherapy is treatment of choice for adolescent girls presenting with ovarian mass.

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