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Hepatoid Variant of Yolk Sac Tumor of Both Ovaries With Widespread Intra-abdominal and Lung Metastasis: A Case Report

Srilatha Parampalli Srinivas[1*], Archana Shivamurthy[2], Lakshmi Rao[3], Rajeshwari Gurumoorthy Bhat[4]

1. *Dept . of Pathology, Kasturba Medical College, Manipal Academy of Higher Education, Manipal, Karnataka, India*
2. *Dept. of Pathology, Melaka Manipal Medical College , Manipal Academy of Higher Education, Manipal, Karnataka, India*
3. *Dept. of Pathology, Armed Forces Hospital, Muscat, Oman*
4. *Dept. of Obstetrics and Gynaecology, Melaka Manipal Medical College, Manipal Academy of Higher Education, Manipal, Karnataka, India*

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ABSTRACT

Hepatoid variant of yolk sac tumor of ovary is an unusual tumor with an aggressive behavior. It is usually observed in young females, presents with abdominal complaints and is associated with raised α-fetoprotein (AFP) levels. It should be differentiated from other hepatoid tumors involving the ovary. A complete patient evaluation with gross, microscopy, and immunohistochemistry can identify the site of origin to administer appropriate treatment.

The current study reported the case of a 30-year-old married parous female presenting with abdominal distention and pain of two months duration. She had regular menstrual cycles. Based on lab investigations her serum AFP level was markedly raised to 34,244 ng/mL (normal range: 0-9 ng/mL). Computerized tomography (CT) scan showed large lobulated heterogeneous mass in both ovaries and omental, gall bladder, and lung metastasis. A CT guided biopsy of the ovarian mass was done. On histopathology, a differential diagnosis of hepatoid variant of yolk sac tumor, hepatoid carcinoma of ovary and hepatoid tumor arising from gall bladder metastasizing to the ovary were observed. Patient underwent surgery. Per operatively gross ascites with bilateral ovarian mass, extensive omental, pelvic, and gall bladder deposits were observed. Bilateral salpingo-oophorectomy with omental deposit biopsy was conducted. Histopathology along with immunohistochemistry confirmed a diagnosis of hepatoid variant of yolk sac tumor in both ovaries with widespread intra-abdominal metastasis.

Corresponding information: Dr. Srilatha Parampalli Srinivas, MD (Pathology), Associate Professor, Dept . of Pathology, Kasturba Medical College, Manipal Academy of Higher Education, Manipal, Karnataka, India E-mail- drsrilatha2003@hotmail.com

Introduction

Hepatoid variant of yolk sac tumor of ovary is a rare neoplasm of germ cell origin. It is usually observed in young females, presents with abdominal complaints and is associated with raised serum α-fetoprotein (AFP) levels (1). It may be associated with amenorrhea, hirsutism, and virilism (2) or gonadal dysgenesis (2,3). It should be differentiated from primary hepatoid carcinoma of ovary, metastatic deposits of hepatocellular carcinoma, and metastatic deposits of hepatoid carcinoma occurring in other organs such as pancreas, mediastinum, stomach, urinary bladder, lung, and kidney (1,4). The current study reported a case of hepatoid yolk sac tumor of both ovaries with widespread intra-abdominal and lung metastasis in a 30-year-old parous female.

Case Report

A 30-year-old married parous female presented with abdominal distention and pain of two months duration. She had history of early satiety, loss of appetite, and loose stools after food intake. She had regular menstrual cycles. Her abdomen was distended with ascites. The vaginal examination revealed a solid

mass in the posterior fornix. Computerized tomography (CT) scan showed multiple heterogeneously enhancing lesions in the bilateral adnexal regions not observed separately from bilateral ovaries with multiple omental, peritoneal, sub-diaphragmatic, subhepatic, gall bladder, pouch of Douglas, and lung metastasis. No liver mass was noted. A CT guided biopsy of the ovarian mass was done. Based on lab investigations her serum AFP level was 34,244 ng/mL (normal range: 0-9 ng/mL) and CA125 level was 77 ng/mL (normal range: 0-35 ng/mL). In histopathology, a differential diagnosis of hepatoid variant of yolk sac tumor, hepatoid carcinoma of ovary, and hepatoid tumor arising from gall bladder metastasizing to the ovary were observed.

Patient underwent a staging laparotomy. In the operation seven liters of ascitic fluid was drained. Bilateral ovarian mass, extensive omental caking, pelvis, pouch of Douglas, and gall bladder deposits were observed. Bilateral salpingo-oophorectomy with omental deposit biopsy was conducted. Since gall bladder with deposits was friable, it was not touched to avoid injury. Grossly, both ovaries were enlarged with grey white solid, cystic, and hemorrhagic areas (Figure 1).

Histopathology of both ovaries and omental deposit showed sheets of large polygonal cells interspersed by fibrous bands (Figure 2).

Tumor cells had dense eosinophilic to focally vacuolated cytoplasm, vesicular nucleus with prominent nucleoli, and few mitotic figures. Many intra- and extra- cellular hyaline globules, scattered syncytiotrophoblastic giant cells (Figure 3), microcytic spaces, and focal glandular elements (Figure 4) were observed.

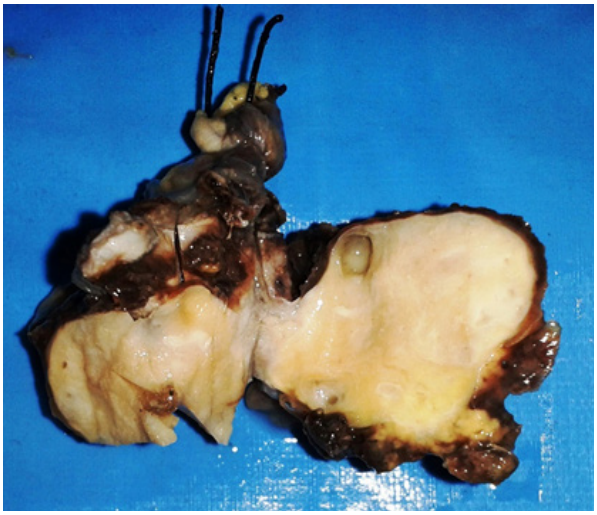

Figure 1. Gross picture of one of the ovaries showing solid and cystic areas

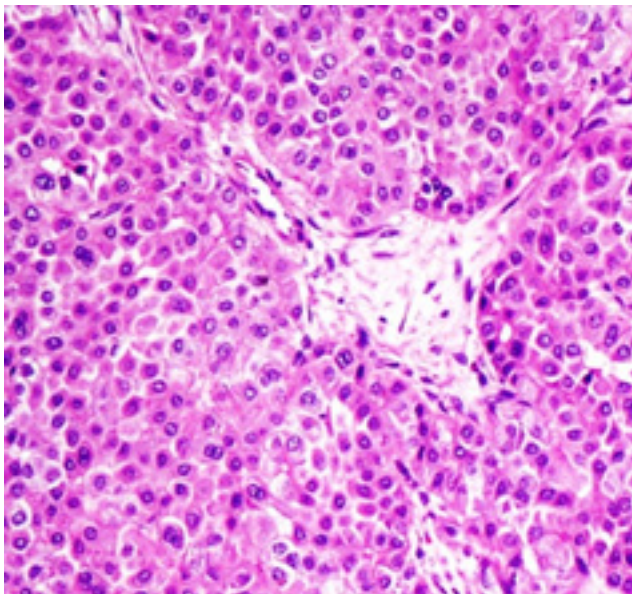

Figure 2. Histological section showing tumor arranged in discrete masses and broad bands of large eosinophilic polygonal cells separated by fibrous stroma (H&E; 200X)

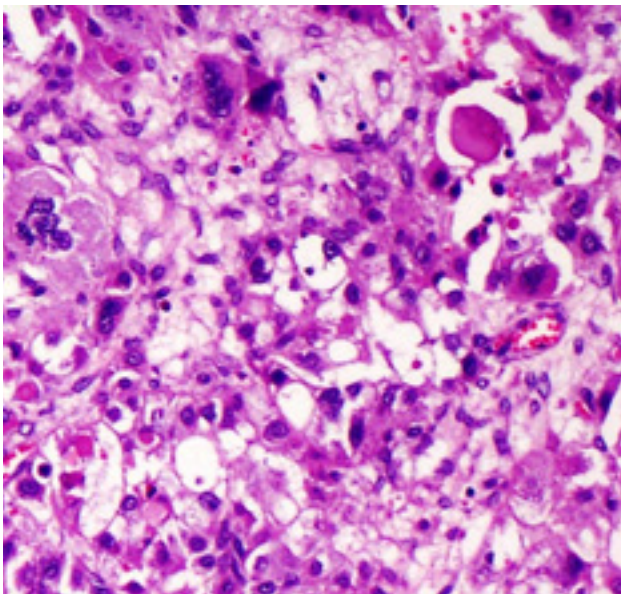

Figure3. Histological section showing tumor with intra- and extra-cellular hyaline globules and scattered syncytiotrophoblastic (H&E; 200X)

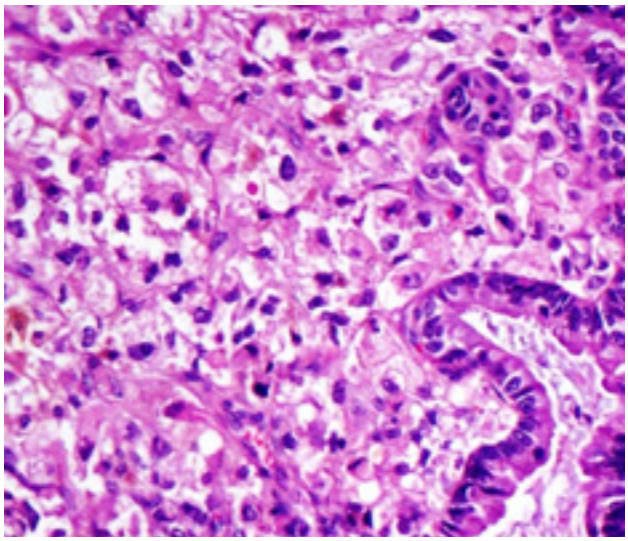

Figure 4. Histological section showing tumor with glandular elements (H&E; 200X)

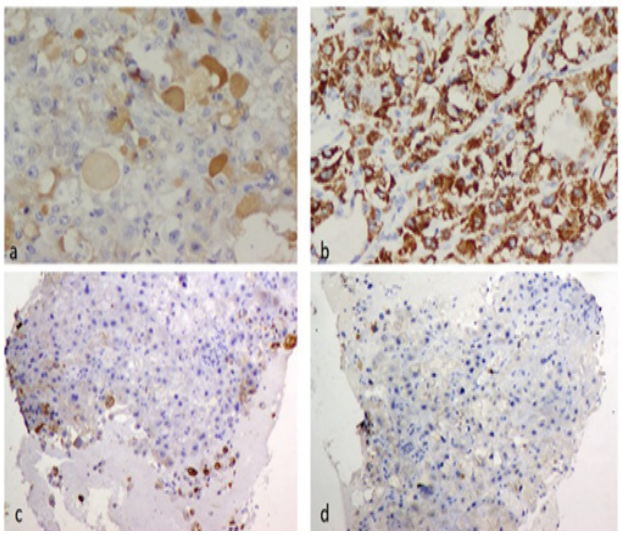

Figure 5. Immunohistochemistry showing intra- and extra- cellular hyaline globules positive for AFP (a), diffuse positivity for Hep Par1 (b), focal positivity for pancytokeratin (c), and focal faint positivity for CK7 (d) (200X)

Based on immunohistochemistry, pancytokeratin (AE1/AE3) was focally positive in the tumor cells. CK7 was focally faintly positive in the tumor cells. AFP was positive in the intra- and extra- cellular hyaline globules. Hep Par1 was diffusely positive in the tumor cells (Figure 5).

A final diagnosis of hepatoid variant of yolk sac tumor of both ovaries with widespread intra- abdominal and lung metastasis was rendered. Since she was in stage IV, palliative cisplatin-based chemotherapy regimen comprising three courses of bleomycin, etoposide and cisplatinum and one course of cisplatinum and etoposide at three-week interval was planned. During the course of chemotherapy, she developed liver metastasis and pleural effusion. After the fourth course of chemotherapy, since the AFP levels did not reach the reference range, she was given three more course of chemotherapy. After the seventh course of chemotherapy, presently her AFP level was 53 ng/mL. She tolerated the courses of chemotherapy well.

Discusstion

In 1982, Prat et al., first described seven cases of unusual types of yolk sac tumors with predominant pattern resembling hepatocellular carcinoma and termed them as hepatoid yolk sac tumor of the ovary (endodermal sinus tumor with hepatoid differentiation). He also proposed the embryologic basis behind this differentiation. In early embryonic life, the yolk sac is in direct continuity with the primitive gut, which is also referred to as secondary yolk sac vesicle. From this vesicle, the hepatobiliary analage originates (5). Histologically, this tumor is characterized by discrete masses, nests and broad bands of large polygonal cells separated by fibrous stroma. The tumor cells have abundant eosinophilic, granular cytoplasm, and central round nuclei with prominent nucleoli. Numerous intra- and extra-cellular periodic acid- Schiff (PAS) positive, diastase resistant hyaline globules are observed. Occasional glandular elements can be observed (2,5).

Hepatoid ovarian yolk sac tumor should be differentiated from primary hepatoid carcinoma of ovary, metastatic deposits of hepatocellular carcinoma to the ovary, and metastatic deposits of hepatoid carcinoma occurring in other organs such as pancreas, mediastinum, stomach, gall bladder, urinary bladder, lung, and kidney to the ovary.

Primary hepatoid carcinoma of ovary has supposedly a surface epithelial origin. It is usually observed in the post-menopausal women aged 42 to 78 years (mean 63), with normal gonadal development, increase in serum AFP levels and CA 125 and presence of intracellular hyaline globules. This tumor is posi-

tive for pancytokeratin, Hep Par1, and diffusely positive for polyclonal CEA, AFP, and CK7.

Hepatoid ovarian yolk sac tumors is a germ cell tumor usually observed in younger population aged 7 to 54 years (mean 22), can be associated with gonadal dysgenesis and virilising symptoms, increase in serum AFP levels and CA125, presence of intra- and extra-cellular hyaline globules, occasional presence of glandular structures, and has an aggressive course. This tumor is positive for pancytokeratin, AFP, focally positive for polyclonal CEA and negative for CK7 (2, 6-8). Some of them can be positive for Hep Par1 (9).

Tumors metastatic to the ovary constitute about 5%-10% of all ovarian tumors (10). Primary hepatocellular carcinoma, and hepatoid carcinomas arising from organs such as pancreas (11), mediastinum, stomach, urinary bladder, gall bladder (12), lung, and kidney (3,6) can rarely metastasis to the ovary.

In the current case, the patient was young and presented with widespread metastasis, very high serum AFP levels, elevated serum CA 125 levels, with presence of both intra- and extra-cellular hyaline globules, focal glandular elements, and few scattered syncytiotrophoblasts. In the current case, the tumor showed focal faint positivity for CK7, focal positivity for pancytokeratin (AE1/AE3), AFP positive hyaline globules, and diffusion positivity for Hep Par 1. Absence of bile in the tumor cells and no liver lesions at the time of diagnosis ruled out metastatic deposits of hepatocellular carcinoma to the ovary.

In patients with advanced disease, such as the current case, a surgical debulking of the tumor followed by palliative cisplatin-based chemotherapy improves the prognosis. The current study patient completed seven courses of cisplatin-based chemotherapy and her serum α-fetoprotein levels gradually reduced.

Conclusion

Hepatoid variant of yolk sac tumor is a rare and aggressive tumor. It should be differentiated from other hepatoid tumors involving the ovary. A complete patient evaluation with radiology, gross, microscopy, and immunohistochemistry can identify the site of origin to administer appropriate treatment.

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Conflict of interest

The authors declared no conflict of interest.

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