Ovarian gonodoblastoma with yolk sac tumor in a young 46, XX female: case report

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Summary

Background: Gonodoblastomas with ovarian germ cell tumors (OGCTs) other than dysgerminoma are very unusual. This is the first case report of a pure endodermal sinus tumor of the ovary with gonodoblastoma in a 46 XX, female. *Case:* A 19-year-old female was admitted to our hospital with an abdominal mass and pain. She had elevated levels of CA-125 and AFP. Fertility sparing surgery was undertaken and revealed a Stage IA endodermal sinus tumor and gonodoblastoma in the same ovary. The patient refused chemotherapy and was followed-up for six months without disease. *Conclusion:* Gonodoblastomas may occur in conjunction with OGCTs. Tumor markers and immunohistochemical examination may help in the diagnosis of these OGCTs with gonodoblastoma.

Key words: Gonodoblastoma; Endodermal sinus tumor; Yolk sac tumor; Immunohistochemistry; Tumor markers.

Introduction

Ovarian germ cell tumors (OGCTs) comprise approximately 20-25% of all ovarian neoplasms. Endodermal sinus tumor (EST) compromises approximately 20% of ovarian germ cell tumors [1, 2]. EST derived from the primitive yolk sac is rare and highly malignant tumors occurring primarily in children and young women. AFP levels are often elevated and useful in monitoring response to treatment in EST.

Gonadoblastomas are unusual germ cell sex cord neoplasms generally occurring in dysgenetic streak ovaries. Most neoplasms associated with gonadoblastoma are of germ cell origin, and dysgerminoma is the most common type [2]. However, to date pure EST arising in an ovary with gonodoblastoma has not been reported. The clinicopathologic findings of a case of gonodoblastoma with a pure EST in 46 XX female are described.

Case Report

A 19-year-old unmarried female who presented with an abdominal mass and pain was referred to the Department of Obstetrics and Gynecology, Faculty of Medicine, University of Yüzüncü Yıl. On clinical examination a huge mass extending above the umbilicus was palpable on her abdomen. She had regular menses and her breast development was normal. She did not have any sign of virilization or clitoromegaly. The laboratory tests were normal, except for increased alfa-fetoprotein (> 300 U/ml) and CA-125 levels (95 U/ml). She had mild hydronephrosis on both kidneys and a 25 x 16 x 10 cm semi-solid mass with septations extending from the pelvis to the liver on computed tomography (CT).

Laparotomy with a median incision was carried out. On exploration, a 25 x 22 x 20 cm semi-solid mass with a smooth surface and grayish color was found originating from the left ovary. The right ovary and other genital structures were macroscopically normal. The mass was removed after collecting peritoneal washings. Frozen-section was reported to be malignant and fertility-sparing surgery for ovarian cancer was performed. The postoperative course was uneventful.

Pathological examination

Macroscopically the mass was cystic with a diameter of 23 cm. It contained viscous material and the inner surface was hemorrhagic with solid or papillary areas. Histopathologically, the tumor consisted of two components. Firstly, gonadoblastoma which was composed of cellular nests (germ cells and sex cord derivates) surrounded by connective tissue stroma was noticed. The sex cord derivates formed a coronal pattern along the periphery of the nests and also the surrounding spaces contained hyaline material (Figure 1). Secondly, an EST was seen in solid and papillary areas (Figure 2). The tumor showed areas of epithelial sheets of cells with characteristic abundant clear cytoplasm, PAS-positive, diastase-resistant hyaline globules (Figure 3) and hepatoid differentiation. Immunohistochemical staining for AFP was positive in such sample (Figure 4). Therefore, the case was diagnosed as a mixed germ cell-sex cord stromal tumor (gonadoblastoma and EST), FIGO Stage IA.

Follow-up

Karyotype analysis was done and revealed 46, XX. A chemotherapy regimen of bleomycin, etoposide and cisplatin (BEP) was employed. The patient experienced a serious allergic reaction to the BEP protocol so the vinblastine, adriamycin and cisplatin (VAC) protocol was then proposed. However, she and her family refused further chemotherapy. She was followed-up for six months with normal levels of CA-125 and an AFP level of 14 U/ml.

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Fig. 1

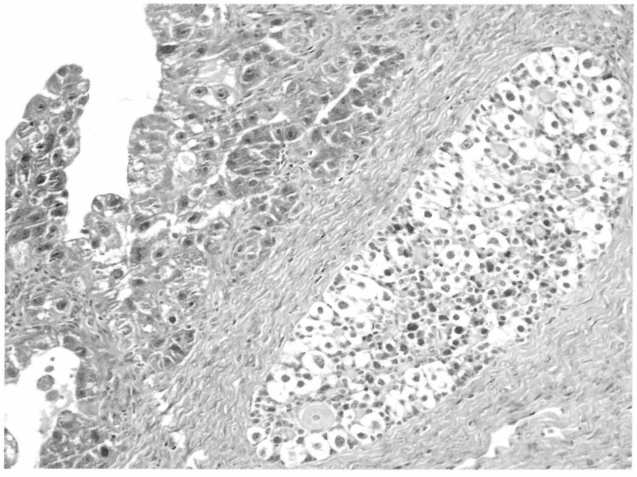

Fig. 2

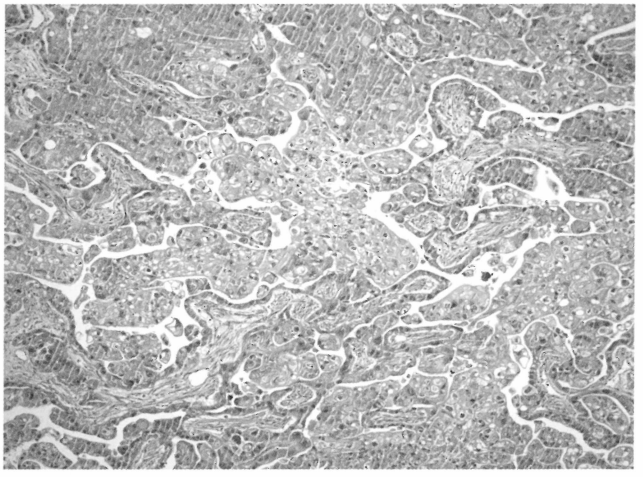

Fig. 3

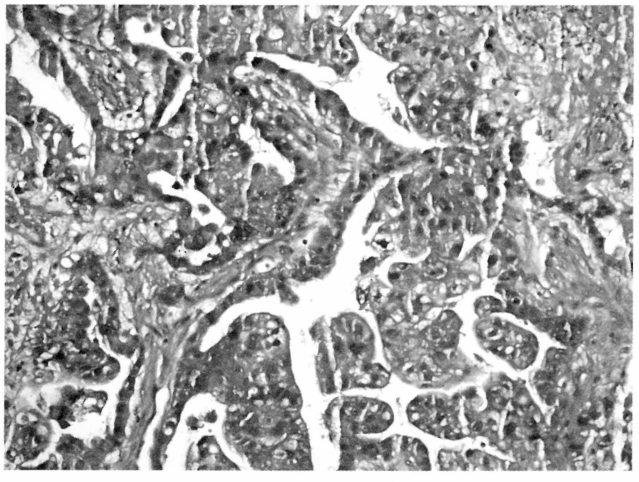

Fig. 4

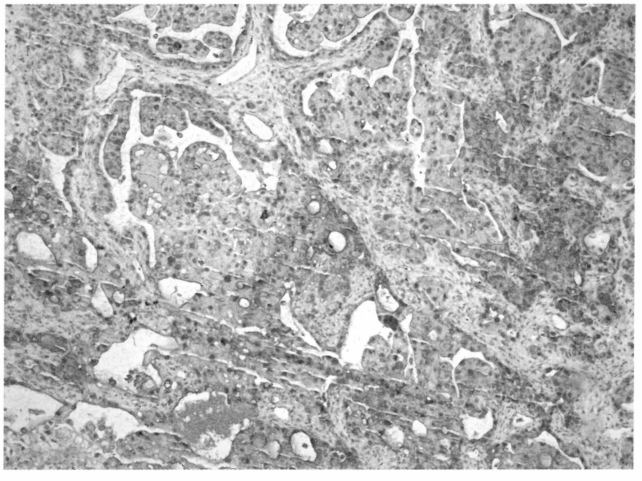

Figure 1. — Gonodoblastoma component of the tumor.
Figure 2. — Endodermal sinus tumor in the same ovary with gonodoblastoma.
Figure 3. — Epithelial sheets of cells showing characteristic abundant clear cytoplasm, PAS-positive, with diastase-resistant hyaline globules.
Figure 4. — Immunohistochemical staining for AFP is positive in the sections.

Discussion

Gonadoblastomas are tumors that are linked to gonadal development, and are reported to contain immature germ and stromal cells. Gonodoblastomas with OGCTs other than dysgerminoma are very unusual. It is reported that the risk of developing germ cell neoplasms in patients with a Y chromosome is higher [3]. Most gonadoblastomas arise in the dysgenetic gonads of XY sex-reversed individuals and are rarely encountered in 46 XX. In 50-60% of cases, gonadoblastomas are associated with OGCTs, mostly presenting as a pure dysgerminoma [4]. The present case study is unique in that it represents EST in an ovary with gonodoblastoma in a 46 XX female. Pauls *et al.* reported that gonodoblastomas are populated by germ cells at a fetal stage of differentiation and also found histological similarities between the microfollicular pattern of gonadoblastoma and the fetal ovarian organization of oocytes in nest-like structures, the so-called oocytic clusters [4]. These findings indicate that every gonadoblastoma should be examined completely and carefully to exclude an invasive OGCT component. The prognosis of patients with gonadoblastoma associated with dysgerminoma is generally very good, however other OGCTs associated with gonodoblastama have a poor prognosis.

Obata *et al.* reported a case of gonadoblastoma with dysgerminoma in the left ovary and gonadoblastoma with dysgerminoma and yolk sac tumor in the right ovary of a 10-year-old 46 XX girl [5]. Zhao *et al.* reported unilateral gonadoblastoma with mixed OGCT (choriocarcinoma, embryonal carcinoma, yolk sac tumor, immature teratoma and dysgerminoma) arising in the ovary of a 27-year-old woman with 46,XX karyotype [6]. The case in this study was pure EST with gonodoblastoma of the ovaries in a 46 XX female. Our case showed hepatic differentiation which is a relatively rare feature of the common yolk sac tumor. Although the prognosis is poor, the patient in this case study was free of disease for six months. In conclu-

sion, gonodoblastomas may occur in conjunction with OGCTs. Tumor markers and immunohistochemical examination may help in the diagnosis of these OGCTs with gonodoblastoma.

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