Clinical Note

Ruptured ovarian granulosa cell tumor as a cause of hemoperitoneum

Berna Dilbaz, MD, *Burak Karadag,* MD,
Deniz Hizli, MD, *Serdar Dilbaz,* MD.

Ovarian granulosa cell tumors (GCT) are rare neoplasms that arise from the sex cord stromal cells of the ovary and represent 2% to 5% of all ovarian cancers.[1] The tumors most commonly affect adults, but 5% present in prepuberty.[1] Peak incidence of GCT is in the age group of 50-55 years.[1] Granulosa cell tumors are hormonally active tumors and the main symptoms are a result of hyperestrogenism. In the reproductive age group, patients may have menstrual irregularities such as menorrhagia, intermenstrual bleeding, or amenorrhea, and in postmenopausal women, abnormal uterine bleeding may be the presenting symptom.[1] However, acute pelvic pain caused by tumor rupture and hemoperitoneum may be rarely the first sign of disease. We present a rare cause of acute abdomen syndrome due to ruptured ovarian GCT in a premenopausal woman.

A 45-year-old multiparous premenopausal patient was admitted to our emergency service with acute pelvic pain. Vital signs were stable except for tachycardia. Abdominal tenderness and left adnexal mass was detected by pelvic examination. The patient complained of menometrorrhagia for 3 months and all laboratory tests including complete blood count, ß-human chronic gonadotropin, and infection markers were within normal limits. A solid mass (82x67 mm) in the left ovary with 73x22 mm free intra-abdominal liquid was determined during the transvaginal ultrasonographic examination (**Figure 1**). Doppler measurement of the mass was resistance index (RI): 0.57 and pulsatility index (PI): 0.86 (**Figure 2**). Hemoglobin level showed a decreasing pattern, and acute abdomen symptoms developed during the follow-up period. Therefore, laparoscopic surgery was performed. At surgery, ruptured left ovarian mass, and intra-abdominal 1000 cc of fresh and old blood clots were detected. Laparoscopic left salpingo-oophorectomy was performed. Frozen section examination was reported as GCT. Therefore, the operation was extended to the right salpingooferectomy, total abdominal hysterectomy, bilateral pelvic, and para-aortic lymphadenectomy. Final pathologic examination was reported as "stage IC granulosa cell tumor." The patient received platinum-based adjuvant chemotherapy, postoperatively.

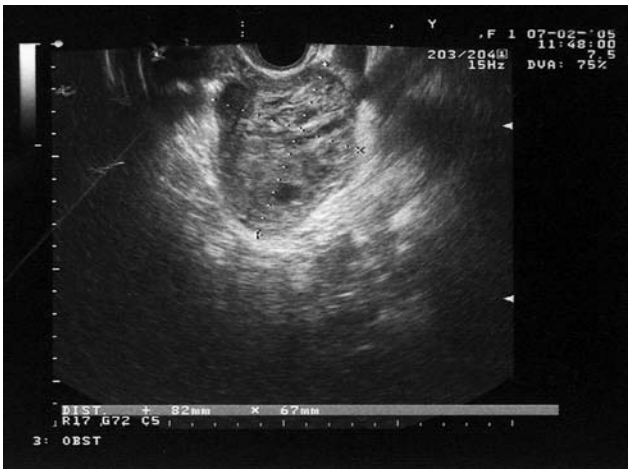

Figure 1 - A solid mass (82x67 mm) in the left ovary with 73x22 mm free intra-abdominal liquid was determined during the transvaginal ultrasonographic examination.

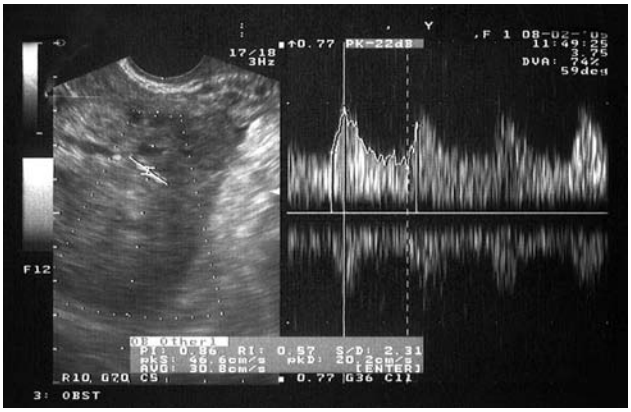

Figure 2 - Doppler measurement of the mass was RI: 0.57 and PI: 0.86

Granulosa cell tumors are rare and reported incidents of 0.58-1.6/100.000 women a year.[2] These tumors secrete estradiol, and this is responsible for the clinical signs like menorrhagia, intermenstrual bleeding or amenorrhea.[3] Approximately 25-50% of GTCs are associated with endometrial hyperplasia whereas 5-13% are associated with an endometrial cancer.[1] Endometrial cancer related to GTCs is usually well differentiated, at early stage and with good prognosis.

Granulosa cell tumors are staged surgically according to the International Federation of Gynecology and Obstetrics ovarian cancer staging system. Assessment of stage is the most important factor in determining prognosis and to guide postoperative treatment recommendations. Total abdominal hysterectomy with bilateral salpingo-oophorectomy and lymphadenectomy is recommended for women who are done with

childbearing. For women with stage I disease who wish to preserve fertility, a unilateral salpingo-oophorectomy, and uterine preservation with other procedures for complete surgical staging are appropriate.[4] Patients with stage I disease have an excellent prognosis and very often do not require further adjuvant treatment. However, survival outcomes are less favorable for women with higher stage disease and for those with stage I disease who have a tumor rupture.[5] Usually, postoperative chemotherapy is suggested in patients who are >40 years at diagnosis, have large tumor size, or have ruptured tumor because of the high risk of disease progression.[5] In our case, the woman was at 45 years old, did not request to preserve her fertility and has a ruptured tumor at initial diagnosis. Therefore, total abdominal hysterectomy with bilateral salpingo-oophorectomy and lymphadenectomy followed by adjuvant chemotherapy seemed to be the most appropriate treatment regimen for this patient. Granulosa cell tumors may rarely present with hemoperitoneum. To the best of our knowledge, our case is the sixth case of GCT presenting with hemoperitoneum in the English literature.

Granulosa cell tumors should be considered in the differential diagnosis of hemoperitoneum, especially in patients with menstrual irregularity and adnexal mass. We emphasize once more that; frozen section examination should be performed in all patients who undergo surgery for adnexal masses except emergency conditions.

Our case sheds light on the characteristic of GCT which represents that GCT may be prone to rupture and cause hemoperitoneum. However, further prospective large studies are needed to determine the exact incidence of hemoperitoneum and its impact on survival in patients with GCT.

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From the Department of Obstetrics & Gynecology (Dilbaz B, Dilbaz S), Etlik Zubeyde Hanim Women's Health Teaching and Research Hospital, Ministry of Health (Karadag), Erbaa State Hospital, Erbaa, Tokat, and the Department of Obstetrics & Gynecology (Hizhi), Fatih University, Faculty of Medicine, Ankara, Turkey. Address correspondence and reprints request to: Dr. Burak Karadag, Ministry of Health, Erbaa State Hospital, TR-60500, Erbaa, Tokat, Turkey. Tel. +90 (505) 5863856. Fax. +90 (312) 3462388. E-mail: drburakkaradag@gmail.com

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