*Received: November 25, 2023*
*Accepted: December 5, 2023*

*Acad Med J 2023;3(3):108-115*
UDC: 618.11-013.1-006.6:618.3
DOI: https://www.doi.org/10.53582/AMJ2333108p
*Case report*

# OVARIAN DYSGERMINOMA IN PREGNANCY

**Petrova Deva[1,2], Kubelka Sabit Katerina[1,2], Trajkova Kornelija[1,2], Jashar Dzengis[1,2]**

[1]Faculty of Medical Sciences, Goce Delcev University, Stip, Republic of North Macedonia
[2]Clinical Hospital Acibadem Sistina, Skopje, Republic of North Macedonia

## Abstract

Dysgerminoma is a very rare germ cell tumor of the ovary. It constitutes about 1% of all germ cell malignancies and accounts for 1-5% of all ovarian malignancies in the first two decades of life. Approximately 80% of cases are reported in patients younger than 30 years of age (mean age: 21 years), whereas 75% of women with dysgerminomas present with stage I of the disease. Ovarian tumors generally remain asymptomatic, until they are discovered due to their large size or related complications.

Dysgerminomas can occur in pregnant women. The most commonly used diagnostic methods for ovarian tumors in pregnancy are ultrasound and magnetic resonance, not using radiation for ensuring safety of the fetus. Several factors have influence on treatment decisions such as: gestational week of the pregnancy, patient's expectations, stage of the disease, influence of the diagnostic methods for assessing the stage of the disease on the fetus, as well as the reproductive history of the patient. In stage I of the disease, fertility sparing surgery with unilateral salpingo-oophorectomy can be performed if the patient wants to preserve fertility. No chemotherapy is required for stage I tumors, unless recurrence occurs (9.2% cases).

We present a case of dysgerminoma in a pregnant patient, treated with unilateral salpingo-oophorectomy. After two years of follow-up, the patient remained free of disease.

***Keywords:*** ovarian dysgerminoma, pregnancy, conservative surgery

## Introduction

The occurrence of an adnexal mass during pregnancy is a rare complication. However, with the use of frequent ultrasound examinations, the diagnosis of an adnexal mass or cyst during pregnancy has become easier and more frequent. Most of these masses are benign, and only 1-6% have been reported as malignant tumors[1].

Evaluation of an adnexal mass and the differential diagnosis of a possible adnexal malignant tumor can be managed with ultrasound examination, abdominal MRI and specific serum tumor markers. Gynecologist's experience in ultrasound examination of ovarian tumors is of great importance in the distinction between benign and malignant ovarian tumors, especially during pregnancy. The most common benign ovarian masses in pregnancy are functional cysts. These

cysts are hormonally influenced and have distinctive ultrasound morphology, consisting of thin wall without disturbance of the ovarian overall architecture and lack of vascularization[2].

**Case report**

A 25-year-old patient was admitted to our hospital for routine gynecologic examination for pregnancy control. The ultrasound examination showed a large lobulated tumor mass behind the uterus and a viable fetus without visible anomalies in the 17th week of gestation.

The analysis of tumor markers in the serum showed increased levels of tumor markers Ca 125 (84.1 U/mL) and alpha-fetoprotein (26.6 ng/mL). Therefore, magnetic resonance imaging (MRI) of the pelvis was suggested.

The MRI finding confirmed the presence of a solid bilobated tumor mass located behind the uterus above the urinary bladder and in front of the rectum, more to the right side of the body. The bilobated tumor mass had cranio-caudal diameter of 100x93 mm, and 94x85 mm in antero-posterior diameter (Figure 1).

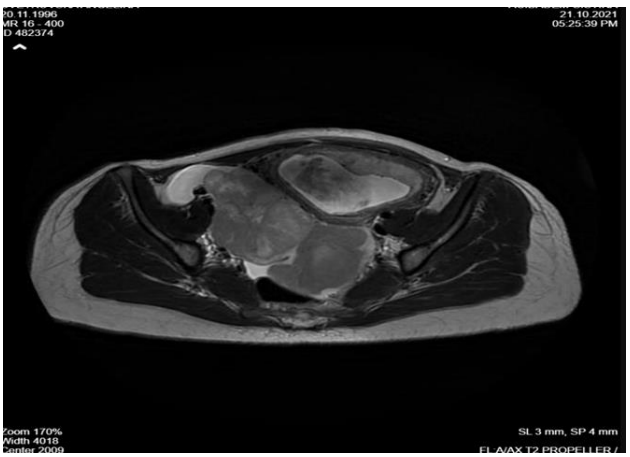

**Fig. 1a.** Non-enhanced MRI of pelvis sagittal view showing tumor mass behind the uterus

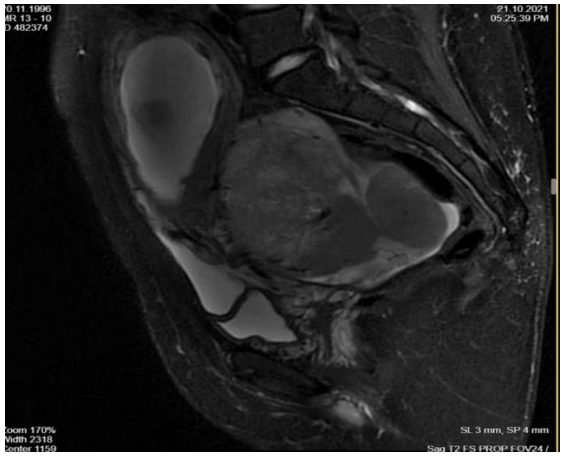

**Fig. 1b.** Non-enhanced MRI of pelvis transversal view showing tumor mass behind and right from the uterus

According to the radiologist's description, the tumor originated from the right ovary, and was clearly demarcated from the urinary bladder and the rectum. Parts of the tumor were necrotic, and according to the MRI characteristics, dysgerminoma was one of the favored differential diagnoses.

One week after the completion of the clinical investigations, the surgeon obtained patient's consent for conservative surgical treatment. At 17 weeks of pregnancy, suprapubic laparotomy was done with right-sided adnexectomy and partial omentectomy. The postoperative follow-up of the patient and the fetus were uneventful.

The postoperative histopathological finding showed an ovarian tumor measuring 170 mm with residual ovarian tissue measuring 40 mm. Tumor surface was smooth, grey-white with visible iatrogenic tumor rupture. The cut surface was homogenous grey-white in color, with alternating soft and more compact tumor areas, containing foci of hemorrhage and necrosis. Upon microscopy, sheets, nests and trabeculae of monotonous tumor cells were separated by thin fibrous septae containing lymphocytes. Tumor cells were polygonal, with well-defined cell borders, abundant clear or eosinophilic cytoplasm, and one central nucleus with one or two prominent nucleoli. Mitoses were common (Figure 2). The immunohistochemical analysis showed that the tumor cells were positive for PLAP (Figure 3a), KIT (CD117) (Figure 3b), and D2-40 (podoplanin) (Figure 3c). Tumor cells were negative for cytokeratin 7, LCA, EMA, CD30, AFP, HCG, Inhibin, SOX10, WT1 and Vimentin. The histopathological and immunohistochemical results were consistent with the pure dysgerminoma.

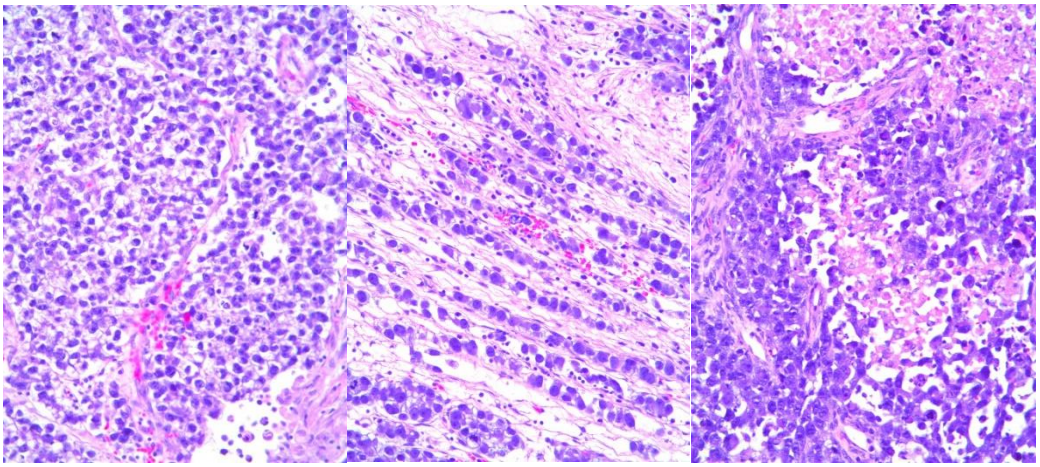

**Fig. 2a-c.** Microscopic appearance of dysgerminoma (hematoxylin and eosin, x200)

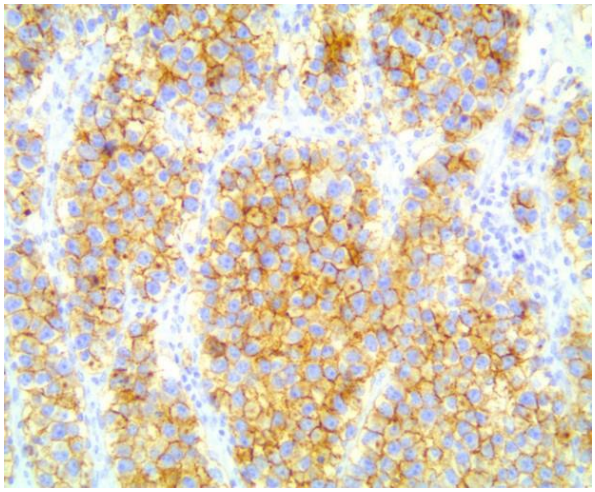

**Fig. 3a.** Tumor cell positive for PLAP (x200)

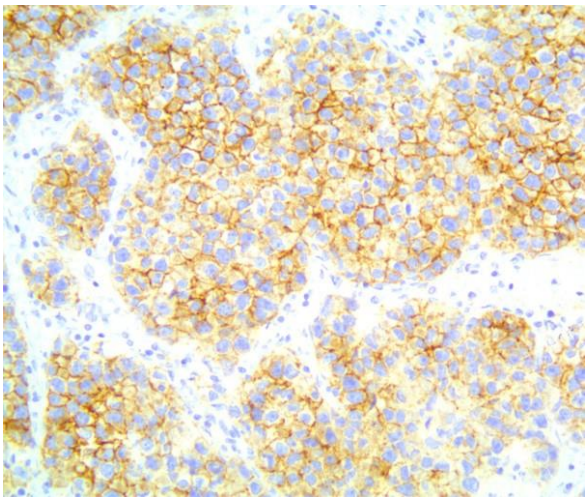

**Fig. 3b.** Tumor cell positive for CD117 (x200)

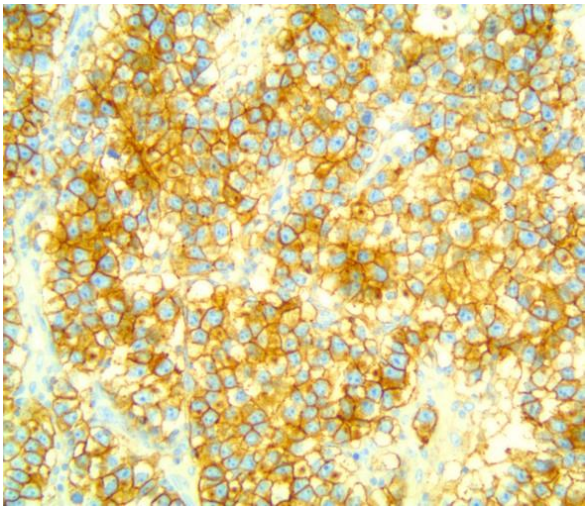

**Fig. 3c.** Tumor cell positive for Podoplanin (x200)

The patient was closely monitored until the end of her pregnancy. The delivery was performed by Caesarean section and a healthy newborn was delivered.

In the course of Cesarean section, biopsy of the left ovary was also performed and the anatomical milieu of the right adnexa was inspected.

The postoperative histopathological examination of the left ovarian biopsy did not show any abnormalities, apart from normal partial decidualization of the fat tissue of the omentum.

One month after delivery, a control MRI of the abdomen and pelvis was done, as well as analysis of serum tumor markers. All findings were within normal limits.

After 2 years of follow-up, the patient is free of disease.

**Discussion**

Dysgerminoma is a rare germ cell tumor of the ovary, constituting about 1% of all germ cell malignancies and 1-5% of all ovarian malignancies in the first two decades of life[3]. Approximately 80% of cases are reported in less than 30 years of age (mean: 21 years), consistent with our case. Our case was diagnosed in stage I, such as 75% of women with dysgerminomas who present with stage I of the disease[4-5].

Pure dysgerminoma is a tumor that is composed of germ cells, or so-called gonocytes and is hormonally inactive, but may sometimes contain embryonic elements that are hormone productive. Dysgerminomas arise from cells dating back to the undifferentiated phase of gonadal development, therefore its counterpart, histologically a very similar tumor called seminoma, also occurs in the testis. Most of dysgerminomas are unilateral (15% of dysgerminomas are bilateral), solid and nodular. They usually have smooth gray, pink, or tan cut surface. Hemorrhage and necrosis can occur, but they are less common than in other malignant ovarian tumors. Microscopically, dysgerminomas show proliferation of epithelioid cells arranged in sheets, nests, or small clusters separated by thin, fibrous septae that contain a sprinkling of lymphocytes. The large, uniform cells have clear or lightly staining cytoplasm and centrally located nuclei[4].

Ovarian tumors generally remain asymptomatic, until they are discovered due to their large size or related complications. The most commonly used diagnostic methods in pregnancy are ultrasound and magnetic resonance, not using radiation for ensuring safety of the fetus.

On ultrasonographic examination, dysgerminomas show well-defined borders, smooth lobulated contours and lobules with heterogeneous echogenicity. At Doppler ultrasonography, they are richly vascularized at power and color[6]. In our case, ultrasound results showed unclear tumor boundaries and presence of lobules with heterogeneous echogenicity. These findings suggested possible malignancy of the ovarian tumor mass.

On non-enhanced magnetic resonance imaging (MRI), the most characteristic appearance of dysgerminoma is a solid mass divided into lobules by fibrovascular septa, and this appearance was also present in our case. In T2-weighted images, the signal intensity was isointense or slightly hyperintense. In T1-weighted images, the signal intensity of the ovarian mass was lower than that of muscles, as expected for dysgerminoma[7].

Dysgerminomas may be asymptomatic or can present with abdominal pain or distension, acute abdomen, or vaginal bleeding[8].

Elevated levels of serum lactate dehydrogenase (LDH) have been noted in patients with dysgerminoma. However, the results of tumor markers during pregnancy should be taken with caution considering the physiological changes that exist during pregnancy.

Pregnancy associated with ovarian malignancy presents multiple challenges. The management of dysgerminoma in pregnancy is complicated, as there are 3 separate but interactive parts, i.e., mother, fetus and malignancy, which must be managed simultaneously.

If a dysgerminoma occurs in pregnancy, it can lead to maternal-fetal compromise, due to an increased risk of tumor torsion, incarceration or rupture and hemorrhage during the pregnancy or vaginal delivery[9]. In our case, the tumor was asymptomatic, without any maternal-fetal problems.

Of course, in making treatment decision, several factors have influence, such as the gestational week of pregnancy, patient's expectations, stage of the disease, the influence of the diagnostic methods for assessing the stage of the disease on the fetus, as well as the reproductive history of the patient.

Several authors have stated that once the existence of ovarian malignancy is suspected, immediate laparotomy is indicated regardless of the stage of the gestation[10]. However some authors support a more conservative approach in younger pregnant patients, especially if the ovarian lesion is intact or is of the mucinous type[11].

There are still unresolved issues concerning a conservative management of ovarian masses before and after termination of the pregnancy for early-stage ovarian malignancy with concurrent pregnancy. In stage IA-C, conservative or fertility sparing surgery can be done if a patient desires future pregnancies. This will ordinarily include staging laparotomy with unilateral salpingo-oophorectomy. No chemotherapy is required for stage I tumors unless there is recurrence of the disease, which occurs in 9.2% of the cases. Five-year survival rate for stage IA dysgerminomas is over 95%[12]. In our case, despite the fact that the size of the tumor was 170 mm, in accordance with these data, as well as the desire of the patient, a decision was made towards fertility sparing surgery. It was successfully performed without affecting the fetus and without complications for the mother.

One series found a 10-year survival rate of 88.6% following conservative surgery of patients with dysgerminoma confined to the ovary; smaller than 10 cm in size; with an intact, smooth capsule unattached to other organs; and without ascites[13].

Bilateral salpingo-oophorectomy and hysterectomy are recommended for stage II and III of the disease. However, fertility sparing surgery can be done even in bilateral dysgerminomas if a patient desires future pregnancies as no difference in outcome between fertility sparing and non-conservative surgery has been found. Recommended treatment options for stage II, III and IV of the disease are complete tumor resection followed by 4 cycles of Bleomycin, Etoposide, and platinum chemotherapy. Patients with bulky residual disease require additional cycles[13,14].

In the study by Zaghloul *et al*., in a series of 22 patients with different stages of ovarian dysgerminomas, 76% five-year survival was confirmed independent of the stage, which is in favor of a good prognosis of ovarian dysgerminomas. These data should be taken into account when making treatment decisions, especially in such a sensitive group of patients as those having dysgerminomas during pregnancy[15].

**Conclusion**

Whenever there is a tumor mass in the ovarian lodge during pregnancy, a differential diagnosis of dysgerminoma should be considered. The long-term outcome of patients with ovarian dysgerminoma during pregnancy is excellent. A good reproductive function and high survival rates can be achieved in patients treated with conservative surgery and without chemotherapy in stage I dysgerminomas.

*Conflict of interest statement*. None declared.

**References:**


1. Smith HO, Berwick M, Verschraegen CF, Wiggins C, Lansing L, Muller CY, Qualls CR. Incidence and survival rates for female malignant germ cell tumors. *Obstet Gynecol*. 2006 May;107(5):1075-85. doi: 10.1097/01.AOG.0000216004.22588.ce. PMID: 16648414.
2. Anwar S, Rehan B, Hameed G. MRI for the diagnosis of ultrasonographically indeterminate pelvic masses. *J Pak Med Assoc*. 2014;64(2):171–4.
3. Quirk JT, Natarajan N. Ovarian cancer incidence in the United States, 1992–1999. *Gynecol Oncol*. 2005;97(2):519–23
4. Gupta M, Saini V. Germ cell tumors and their association with pregnancy. In: Ahmed RG, editor. Germ Cell. IntechOpen; 2017.
5. Sas I, Serban D, Tomescu L, Nicolae N. Ovarian dysgerminoma in pregnancy: A case report. *Medicine* 2021; 100: e25364
6. Shaaban AM, Rezvani M, Elsayes KM, Baskin H Jr, Mourad A, Foster BR, Jarboe EA, Menias CO. Ovarian malignant germ cell tumors: Cellular classification and clinical and imaging features. *Radiographics*. 2014;34(3):777-801.
7. Kitajima K, Hayashi M, Kuwata Y. MRI appearances of ovarian dysgerminoma. *Eur J Radiol Extra* 2007;61:23–5.
8. Jain M, Budhwani C, Jain AK, Hazari RA. Pregnancy with ovarian dysgerminoma: an unusual diagnosis. *J Dent Med Sci* 2013;11:53–7.
9. Chen Y, Luo Y, Han C, Tian W, Yang W, Wang Y, Xue F. Ovarian dysgerminoma in pregnancy: A case report and literature review. *Cancer Biol Ther* 2018; 19: 649–658.
10. Matsuyama T, Tsukamoto N, Matsukuma K, Kamura T, Kaku T, Saito T. Malignant ovarian tumors associated with pregnancy: report of six cases. *Int J Gynaecol Obstet* 1989. Jan;28(1):61-66 10.1016/0020-7292(89)90545-6
11. Karlen JR, Akbari A, Cook WA. Dysgerminoma associated with pregnancy. *Obstet Gynecol* 1979;53:330–5.
12. Thomas GM, Dembo AJ, Hacker NF, DePetrillo AD. Current therapy for dysgerminoma of the ovary. *Obstet Gynecol* 1987:70 (2): 268-75.
13. AL Husaini H, Soudy H, El Din Darwish A, Ahmed M, Eltigani A, AL Mubarak M. et al. Pure dysgerminoma of the ovary: a single institutional experience of 65 patients. *Med Oncol* 2012.

14. Benedet JL, Bender H, Jones H 3rd, Ngan HY, Pecorelli S. FIGO staging classifications and clinical practice guidelines in the management of gynecologic cancers. FIGO Committee on Gynecologic Oncology. *Int J Gynaecol Obstet* 2000;70:209–62. .
15. Zaghloul MS, Khattab TY. Dysgerminoma of the ovary: good prognosis even in advanced stages. *Int J Radiat Oncol Biol Phys*. 1992;24(1):161-5. doi: 10.1016/0360-3016(92)91036-m. PMID: 1512152.