

# Spontaneous Pregnancy After Fertility-Sparing Surgery and Adjuvant Chemotherapy for Advanced Pure Dysgerminoma: A Case Report

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## 1 Introduction

Malignant ovarian germ cell tumor (MOGCT), a rare form of ovarian malignancy, predominantly affects adolescents and young women of reproductive age [1, 2]. This group of ovarian cancers includes various subtypes, including dysgerminoma, yolk sac tumors, embryonal carcinoma, non-gestational choriocarcinoma, mixed germ cell tumors, and immature teratomas, each with distinct characteristics [3-5]. Dysgerminoma, akin to male seminoma, represents the most prevalent histological variant and immature teratoma and is associated with relatively high bilaterality rates [4, 6, 7].

Platinum-based chemotherapy regimens have proven effective in extending survival and preserving fertility [1, 8]. Given the chemosensitivity of these tumor cells, fertility-sparing surgery (FSS) has become a preferred treatment approach, particularly in patients desiring to preserve their reproductive capability. FSS, which involves complete staging and the preservation of at least the uterine corpus and a portion of one ovary, has emerged as the primary treatment modality in patients with early-stage MOGCT [8-10]. However, a couple of studies in which the potential risks of FSS use have been extensively discussed have stated that FSS use can be justifiable in advanced-stage MOGCT patients [10, 11].

Menstrual and reproductive outcomes in patients who survived MOGCT are reportedly similar to those of age-matched healthy women [1, 12]. Ovarian function is typically restored following three or four cycles of platinum-based therapy [12]. However, fertility rates vary significantly, including among patients with advanced MOGCT [2, 8, 11].

In this context, in this case study, an advanced MOGCT patient who underwent complete staging and was treated with FSS coupled with adjuvant cisplatin-based chemotherapy and still achieved spontaneous pregnancy is presented.

## 2 Case Presentation

A 23-year-old woman presented with a 6-month history of abdominal distention and a progressive increasing palpable mass in the lower abdominal quadrants. At the time of admission, the size of the mass was equivalent to the swelling in a six-month-pregnant woman. Her personal and familial medical history was unremarkable.

Her physical examination revealed a firm, smooth, and painless palpable mass in the right lower quadrant. Ultrasonography revealed a solid right adnexal mass with a diameter of 20 cm, accompanied by mild hydronephrosis on the right side. The left ovary and uterus appeared normal.

Subsequent computed tomography revealed a pelvic mass with a diameter of 22 cm, characterized by an indistinct border between the uterus and pelvic sidewalls. There was also evidence of right ureteral dis-

placement (Figure 1a and 1b). Laboratory tests measuring alpha-fetoprotein, carcinoembryonic antigen, and cancer antigen 125 (CA125) levels did not reveal any abnormal results.

Following the diagnosis of a right ovarian mass, the patient underwent surgical exploration via laparotomy. Consequently, a 22 cm right ovarian mass with external projections, moderate ascites, and peritoneal implants were observed intraoperatively (Figure 2a and 2b). The remainder of the abdominal cavity appeared normal, and ascitic fluid was sampled for cytological examination. Intraoperative cytological frozen analysis of the tumor revealed malignant cells of the germinal nature. Right salpingo-oophorectomy was performed for mass excision, and a biopsy was taken from the left ovary, which appeared more prominent than average. Excision of all tumoral implants, pelvic and paraaortic lymph node dissection, and omentectomy were also carried out. No intraoperative frozen section examination was performed. The patient received a total of 11 units of transfused erythrocytes, eight intraoperatively and three postoperatively, with no postoperative complications. She was discharged on the fifth day after the surgery.

The final histopathological examination revealed a pure dysgerminoma with multiple lymph node involvement and omental and peritoneal metastases. Accordingly, she was diagnosed with FIGO (International Federation of Obstetrics and Gynecology) 3AMOGCT, indicating that the cancer has spread to the serosa of the uterus and/or the tissue of the fallopian tubes and ovaries but not to other parts of the body. Subsequently, the patient was administered BEP (bleomycin, etoposide, and cisplatin) chemotherapy. She provided a complete clinical and radiological response after four cycles of BEP. She was followed up semi-annually during the first year and then annually for the next five years with no signs of recurrence.

The initial examinations, including hysterosalpingography, which were performed due to the patient's desire to have children, indicated the normal functioning of the left salpinx. She had regular menstrual cycles occurring every 30 days and lasting 4–5 days. Nevertheless, she underwent in-vitro fertilization since she could not get pregnant. The first attempt yielded only one mature oocyte with no fertilization. The second attempt yielded two oocytes, one successfully frozen at the blastocyst stage. However, before carrying out the transfer procedure, spontaneous pregnancy occurred. The patient experienced an uneventful pregnancy and gave birth to a healthy baby girl, during which ligation of the left uterine artery was performed to manage postpartum uterine atony.

### 3 Discussion

The favorable fertility outcome in the case presented herein indicates that FSS with adjuvant BEP chemotherapy may be a reliable treatment alternative in patients with advanced dysgerminoma who desire to preserve their fertility. However, large-scale studies are needed to validate the safety and feasibility of using this approach in advanced-stage patients.

Post-treatment pregnancy rates in patients who survived MOGCT are influenced by a range of sociodemographic and clinical factors, including age and desire for future motherhood [4]. Solheim *et al.* [1] reported an encouraging 87.2% post-treatment pregnancy rate in patients who survived MOGCT attempting to get pregnant. Similarly, Chu *et al.* [2] reported that 85.4% of the MOGCT patients with planned pregnancies had successful delivery. Tamauchi *et al.* [13] reported that 40.0% of the 105 MOGCT patients who underwent FSS became pregnant after surgery, and 38.1% had successfully given birth, accounting for 95.2% of the patients who desired to become pregnant. On the other hand, there are also studies that reported relatively lower pregnancy and childbirth rates in this patient group [4, 14, 15].

The discrepancies between reported pregnancy rates in this patient population may be due to the fact that all patients were taken into account in some studies, and only patients with pregnancy plans were taken into account when calculating the pregnancy rate in others. The lack of fertility evaluation in all patients included in the studies and the differences in follow-up periods and evaluated number of pregnancies may also have contributed to the discrepancies between reported pregnancy rates in this patient population [12]. In sum, independent risk factors predicting pregnancy outcomes remain controversial due to inconsistencies between relevant studies available in the literature. Large-scale studies are needed to identify the independent risk factors that can predict pregnancy outcomes.

The number of cisplatin-based chemotherapy cycles and cumulative doses of chemotherapeutics reportedly impact reproductive and sexual functions [1, 16]. Several studies found a correlation between having three or fewer cisplatin-based chemotherapy cycles and higher fertility rates [1, 4]. In contrast, our patient achieved spontaneous pregnancy despite undergoing four cycles of chemotherapy. Similarly, Ghalleb *et al.* [11] reported three full-term natural pregnancies following FSS and six cycles of chemotherapy in MOGCT patients featuring a seminomatous component with an advanced-stage yolk sac tumor.

FSS has been asserted as the primary treatment modality in patients with early-stage (FIGO stages I and II) MOGCT [4, 8, 13, 15, 17]. However, considering that most cases included in these studies were at an early stage, it can be argued that they could not accurately represent real-world data. Husainiet *et al.* [14] reported 32% as the pregnancy rate in patients with pure dysgerminoma, 33.8% of whom had FIGO stage III disease, indicating 87.5% of the patients who have been trying to get pregnant became pregnant. A study conducted in Iran [12] reported the delivery rate as 73% in 26 patients who have been trying to become pregnant, approximately half of whom had FIGO stage III disease. The fact that our patient with FIGO stage III disease also gave a successful delivery supports the idea that many advanced-stage MOGCT patients can achieve pregnancy after being treated with FSS coupled with adjuvant chemotherapy.

#### 4 Conclusion

In the literature, FSS has been asserted as the primary treatment modality in patients with early-stage MOGCT. In addition, age, desire to conceive, number of chemotherapy cycles, and cumulative doses of chemotherapeutics have been reported as major factors affecting pregnancy rates in patients who survive MOGCT. However, this case study demonstrated the potential for successful fertility preservation and pregnancy in an advanced-stage MOGCT patient with pure dysgerminoma treated with FSS and adjuvant chemotherapy, indicating the potentially favorable outcomes of personalized treatment strategies in patients with advanced-stage MOGCT.

In the literature, age, desire to conceive, number of chemotherapy cycles, and cumulative doses of chemotherapeutics have been reported as major factors affecting pregnancy rates in patients who survive MOGCT. Nevertheless, large-scale studies are needed to verify the safety and feasibility of personalized treatment approaches in this patient population.

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**Ethics Statement:** Informed consent was signed by the patient, and all identifiable data has been anonymized wherever possible in compliance with the Helsinki Declaration and local clinical research regulations (American Hospital Kosovo, Protocol # 416, Sept 2 2022)

**Consent Statement:** Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy

**Conflict of Interest:** The authors declare that they have no conflicts of interest.

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