CASE REPORT

Successful Pregnancy after Chemotherapy for Ovarian Yolk Sac Tumor

Nessa M[1], Ahmed N[2], Begum F[3], Sarker A[4], Karim F[5], Salehin S[6]

1. Professor and Head of Department, Department of Gynecology, Holy Family Red Crescent Medical College and Hospital, Dhaka
2. Professor, Department of Gynecology, Holy Family Red Crescent Medical College and Hospital, Dhaka
3. Associate Professor, Department of Gynecology, Holy Family Red Crescent Medical College and Hospital, Dhaka
4. Academic Registrar, Department of Gynecology, Holy Family Red Crescent Medical College and Hospital, Dhaka
5. Registrar,Department of Gynecology, Holy Family Red Crescent Medical College and Hospital, Dhaka
6. MBBS Student, Holy Family Red Crescent Medical College and Hospital, Dhaka

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Abstract

Background: Ovarian yolk sac tumors are rare malignant germ cell tumors in young women. Fertility-sparing surgery plus bleomycin, etoposide, and cisplatin chemotherapy improves survival. Documented reports of term pregnancies after treatment are rare. Case Findings: A 29-year-old woman with a history of left ovarian yolk sac tumor underwent laparotomy with bilateral ovarian cystectomy. uterus and fallopian tubes were preserved. Tumor markers included CA 125 110.04 U/mL and total β hCG 84.57 mIU/mL on 4 March 2021, followed by CA 125 38.0 U/mL, β hCG 0.8 mIU/mL, LDH 244 U/L, and AFP 1150 ng/mL on 25 March 2021. Adjuvant BEP chemotherapy was administered as four 3 weekly cycles on 15 April 2021, 8 May 2021, 4 June 2021, and 24 June 2021, with completion of treatment on 1 July 2021. Whole body 18F-FDG PET/CT on 8 August 2021 showed no evidence of recurrence. She conceived in 2022. Antenatal ultrasonography demonstrated a single live intrauterine pregnancy with normal anatomy and Doppler findings. Outcome: At 38 plus weeks on 22 November 2022, she delivered by elective lower segment cesarean section a healthy female neonate weighing 3.2 kg, Apgar scores 8 and 9. Omental biopsy taken at cesarean was negative for metastasis. Conclusion: This case shows successful term pregnancy after fertility-sparing surgery and BEP chemotherapy for ovarian yolk sac tumor, with disease-free surveillance and negative intraoperative biopsy.

Introduction:

Malignant ovarian germ cell tumors (MOGCTs) are rare, accounting for only 2–5% of all ovarian malignancies, and are most commonly diagnosed in adolescents and young women under 30 years of age. Among MOGCTs, yolk sac tumors (YSTs), also referred to as endodermal sinus tumors, comprise approximately 20–25% of cases[1]. The World Health Organization classifies YSTs under non-dysgerminomatous germ cell tumors, reflecting their distinct biological behavior and histopathologic features. YSTs are typically unilateral, rapidly enlarging, and highly malignant. Common presenting symptoms include abdominal pain, palpable mass, or acute abdomen due to torsion[2]. Diagnostic workup relies on markedly elevated serum alpha-fetoprotein (AFP) levels and histologic identification of Schiller–Duval bodies, a hallmark finding.

Advancements in oncologic treatment have markedly improved outcomes for patients with early-stage YSTs. With modern multidisciplinary management, the 5-year survival rate for stage I disease now exceeds 90%[3]. The current standard of care involves fertility-sparing surgery, most commonly unilateral salpingo-oophorectomy or cystectomy, followed by adjuvant chemotherapy with the BEP regimen (bleomycin, etoposide, and cisplatin)[4]. This approach effectively balances oncologic control with reproductive preservation, an important consideration for the predominantly

young patient population affected. Cure is often achieved after the full course of treatment, and recurrence rates following complete response remain below 10%, provided lifelong surveillance is maintained[5]. The introduction of BEP chemotherapy in the 1980s significantly reduced relapse rates and mortality in MOGCTs, transforming a once-lethal disease into one with excellent long-term survival prospects.

Preserving fertility is now a realistic goal in the treatment of early-stage ovarian YSTs. Fertility-sparing surgery has become routine for patients wishing to retain reproductive potential, and emerging evidence supports its safety and efficacy. A large multicenter analysis by Tamauchi et al. involving 105 survivors of MOGCTs found that most women resumed normal menstruation within 6–12 months of completing chemotherapy[6]. Ovarian function recovery after BEP is common, especially when both uterus and contralateral ovary are preserved. These findings are consistent with the systematic review by Morrison and Nasioudis, which documented conception rates between 60% and 80% among women treated conservatively[7]. The majority of pregnancies occurred spontaneously within 1 to 3 years post-treatment. While long-term reproductive follow-up is not always uniformly reported, the available data suggest a robust return of fertility and a reassuring lack of long-term gonadotoxicity in most cases.

Moreover, pregnancies following YST treatment appear to be generally safe. There is no evidence of increased congenital anomalies or adverse obstetric outcomes among offspring conceived after BEP chemotherapy[8]. Several pooled analyses, including the work of Vasta et al., confirm the absence of teratogenic or mutagenic effects attributable to platinum-based chemotherapy administered in early adulthood[4]. Despite these positive outcomes, reports of successful full-term pregnancies following treatment for ovarian YSTs remain relatively infrequent and often appear only within pooled cohort studies or systematic reviews. Case-specific documentation of individual patients achieving pregnancy and live birth after BEP treatment is limited but clinically important. Such reports contribute to the literature by highlighting real-world outcomes and providing reassurance to patients and clinicians considering fertility preservation strategies in the setting of cancer therapy.

Case Presentation:

A 29 year old woman, gravida 2 para 1 with a prior cesarean section, presented in late 2022 at 38 plus weeks of gestation with a history of malignant ovarian tumor treated with surgery and chemotherapy. Her antenatal records documented amenorrhea consistent with a term pregnancy.

Her oncologic history began in March 2021 when she developed acute lower abdominal pain with an adnexal mass. On 3 March 2021, she underwent laparotomy with bilateral ovarian cystectomy. Intraoperatively, the left ovary contained a gangrenous twisted cyst measuring approximately 14 cm, and the right ovary contained a corpus luteal cyst measuring approximately 4 cm. The uterus and both fallopian tubes were preserved. Tumor markers included CA 125 110.04 U/mL and total β hCG 84.57 mIU/mL on 4 March 2021, followed by CA 125 38.0 U/mL, β hCG 0.8 mIU/mL, LDH 244 U/L, and AFP 1150 ng/mL on 25 March 2021. Immunohistochemistry dated 8 April 2021 reported cytokeratin positive and OCT3/4 positive, with CD30, PLAP, p63, and glypican 3 negative, reported as consistent with yolk sac tumor.

She received adjuvant BEP chemotherapy as four 3 weekly cycles on 15 April 2021, 8 May 2021, 4 June 2021, and 24 June 2021, and treatment was completed on 1 July 2021. Whole body 18F-FDG PET/CT on 8 August 2021 showed no local recurrence. Surveillance ultrasonography later in 2021 was reported as routine.

She conceived in 2022, with last menstrual period dated 25 February 2022. Early pregnancy ultrasound on 12 May 2022 showed a single live intrauterine pregnancy at approximately 9 weeks. Ultrasound on 9 June 2022 confirmed a single live intrauterine pregnancy at 14 weeks 4 days, with

no adnexal lesion detected. A detailed anomaly scan with uteroplacental Doppler on 8 August 2022 demonstrated normal fetal anatomy, normal Doppler indices, normal amniotic fluid volume, and a posterior placenta away from the internal os. A third trimester scan on 31 October 2022 estimated gestation at approximately 34 weeks 5 days, with amniotic fluid index around 15 cm and estimated fetal weight approximately 2.4 kg, with no gross congenital abnormality. Third trimester laboratory testing in mid to late October 2022 recorded hemoglobin approximately 9.7 g/dL.

She underwent elective lower segment cesarean section under spinal anesthesia on 22 November 2022 at 9:45 pm. A female neonate weighing 3.2 kg was delivered with Apgar scores of 8 and 9 at one and five minutes respectively, and the liquor was clear. Intraoperative findings included adhesions between bowel and the anterior abdominal wall, hemostasis was secured, and the abdomen was closed in layers. Both ovaries appeared healthy on inspection. An omental biopsy taken during the procedure showed no metastasis on histopathology. Postoperative hemoglobin on 25 November 2022 was 10.6 g/dL.

Overall, this course documents a single successful term pregnancy after fertility sparing surgery and completion of BEP chemotherapy for ovarian yolk sac tumor, with no evidence of recurrence on imaging surveillance and negative omental biopsy at delivery. Maternal recovery was uneventful and neonatal status was satisfactory.

Outcome:

The patient recovered well following cesarean delivery and routine postoperative management. Her immediate postoperative course was stable, with no febrile episodes or wound complications. Postoperative hemoglobin on 25 November 2022 was 10.6 g/dL. The omental biopsy taken during cesarean delivery revealed no malignant cells, supporting the absence of metastatic disease at the time of delivery.

At postpartum review, the surgical incision was well healed, lochia was normal, and there were no clinical features suggestive of infection or thromboembolic events. Intraoperatively, both ovaries appeared macroscopically healthy and no adnexal masses were identified. She was discharged in stable condition with advice for continued gynecologic and oncology follow up, including periodic AFP monitoring and pelvic imaging as per surveillance protocols.

The neonate, a female weighing 3.2 kg, had Apgar scores of 8 and 9 at one and five minutes respectively, and was discharged in good condition with normal neonatal examination findings.At subsequent follow up, there was no reported clinical evidence of recurrence.

Discussion:

Ovarian yolk sac tumors (YSTs) are rare malignant germ cell neoplasms that primarily affect adolescents and women under 30 years of age, accounting for roughly 20–25% of all malignant ovarian germ cell tumors (MOGCTs)1. Despite their aggressive biology, advances in fertility-sparing surgery and combination chemotherapy have significantly improved long-term survival and reproductive outcomes. Reports of term pregnancies after YST treatment remain uncommon, and the current case adds to the limited documentation of successful term pregnancy following chemotherapy and fertility-sparing management[9].

YSTs are typically unilateral, rapidly growing tumors derived from primitive germ cells, often producing high levels of alpha-fetoprotein (AFP), which serves as both a diagnostic and surveillance marker[10]. Immunohistochemistry findings such as cytokeratin and OCT3/4 positivity support the diagnosis, while post-treatment 18F-FDG PET/CT scans help confirm remission[11]. In the present case, the patient's initial presentation with abdominal pain, elevated AFP, and positive immunohistochemistry was consistent with these established diagnostic criteria. Following bilateral ovarian cystectomy with uterine and tubal preservation and adjuvant BEP (bleomycin, etoposide, cisplatin) chemotherapy, remission was

supported by disease-free surveillance imaging and the absence of radiologic evidence of residual disease.

The BEP regimen remains the global standard for MOGCTs, with 5-year survival rates exceeding 90% in stage I disease and recurrence rates below 10% when treatment and surveillance are optimized[4]. Fertility-sparing surgery, coupled with BEP, has proven oncologically safe, as shown in multiple studies confirming excellent long-term survival and preserved reproductive capacity[2,12]. Ovarian function typically resumes within 6–12 months post-chemotherapy, enabling natural conception in up to 80% of survivors[8]. The patient in this report conceived spontaneously within the first year after completion of therapy, aligning with the literature indicating gonadal recovery and sustained remission.

Pregnancy after chemotherapy for MOGCTs is generally uneventful, with no increased incidence of congenital anomalies or adverse obstetric outcomes[5,13]. The mild anemia experienced during the third trimester in this patient reflects a common, nonspecific obstetric finding rather than a hematologic relapse. Importantly, imaging showed no recurrent adnexal mass, and there were no clinical features suggestive of relapse during pregnancy. Cesarean delivery of a healthy neonate without maternal or neonatal complications parallels previously reported outcomes in similar cohorts[14].

While several studies document pregnancies after YST treatment, detailed reporting of term outcomes following chemotherapy remains limited. The 7 months recurrence-free interval before conception and the healthy outcome in this pregnancy underscore the reproductive safety of fertility-sparing management when combined with structured follow-up[15]. This case reinforces current evidence that early diagnosis, standard BEP chemotherapy, and structured follow-up not only provide curative outcomes but also preserve reproductive potential. Continued longitudinal observation remains essential, but this report adds strong clinical reassurance for young cancer survivors seeking fertility preservation without compromising oncologic safety.

Conclusion:

This case demonstrates the potential for complete oncologic remission and preserved fertility in young women treated for ovarian yolk sac tumor with fertility-sparing surgery and adjuvant BEP chemotherapy. The patient had one prior term pregnancy before diagnosis and subsequently achieved a successful term pregnancy after completion of chemotherapy, with favorable maternal and neonatal outcomes and no evidence of recurrence on available surveillance. This underscores that conservative management, when combined with vigilant follow-up and standard adjuvant therapy, can achieve curative results without compromising reproductive potential. Long-term recurrence-free survival and spontaneous conception after such treatment highlight the safety and efficacy of fertility preservation approaches in this rare but clinically significant malignancy. Continued longitudinal follow-up and careful documentation of similar outcomes will help refine guidelines for counseling and management of young women diagnosed with ovarian germ cell tumors.

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