Case Report
Middle East Journal of Cancer; October 2021; 12(4): 597-601

Management of Ovarian Yolk Sac Tumor in Pregnancy in a Limited Resource Setting: Case Report

Tofan Widya Utami, PhD, Herdhana Suwartono, MD, Erda Ayu Umami, MD, Anggara Mahardika, MD, Raymond Surya♦, MD, Laila Nurana, PhD

Obstetrics and Gynecology Department Faculty of Medicine, Universitas Indonesia, Dr. Cipto Mangunkusumo Hospital, Jakarta, Indonesia

Please cite this article as: Utami TW, Suwartono H, Umami EA, Mahardika A, Surya R, Nurana L. Management of ovarian yolk sac tumor in pregnancy in a limited resource setting: Case report. Middle East J Cancer. 2021;12(4):597-601. doi: 10.304 76/mejc.2021.84039. 1195.

Abstract

Ovarian yolk sac tumor in pregnancy is a very rare case (<5%). The management could be very challenging since studies regarding the disease are very limited. This case report is written in order to report a rare case of yolk sac tumor in pregnancy and its management.

A 29-year-old woman with a 16 weeks gestational age (WGA) in her first pregnancy presented in the emergency room with severe lower abdominal pain. Next, she underwent exploratory laparotomy, and a biopsy was performed, which indicated an ovarian yolk sac tumor. The patient was then given neoadjuvant chemotherapy with carboplatin and paclitaxel. The pregnancy resulted in an intrauterine growth restriction (IUGR) baby, delivered on 33 WGA. The baby was delivered through C-section and the mother continued to undergo optimally debulked laparotomy, total hysterectomy, bilateral salphingo-oophorectomy, omentectomy, and rectosigmoid tumor resection.

In dealing with a rare case with limited resources, tailor-made management is required. The most ideal treatment may not be performed, but the clinician should be more adaptive for the patient to have a better outcome.

Keywords: Ovarian yolk sac tumor, Neoadjuvant chemotherapy, Intrauterine growth restriction

♦**Corresponding Author:**
Raymond Surya, MD
Obstetrics and Gynecology Department, Faculty of Medicine, Universitas Indonesia, Dr. Cipto Mangunkusumo Hospital, Jakarta, Indnesia
Email: raymond_s130291@yahoo.co.id

Introduction

Malignant germ cell tumors (GCTs) comprise 5% of all ovarian cancers and 80% of the preadolescent malignant ovarian tumors.[1] Ovarian yolk sac tumor, as one of the germ cell tumor subgroups, is rare with a prevalence of less than 5% of all ovarian neoplasms.[2] Its appearance in pregnancy is even more infrequent since the malignancy rate of adnexal masses in pregnancy is 1%- 6%.[3-5] Delayed diagnosis must be avoided and the case is to be managed depending on the stage of the disease as well as resource availability, as will be reported in this case report.

Received: October 28, 2019; Accepted: April 21, 2021

Case Presentation

A 29-year-old woman on her first pregnancy presented to the emergency room at a regional public hospital with severe abdominal pain a day prior to admission on the 16th week of gestational age (WGA). The pain was not suppressed through positional changes. There was no fever, nausea, or vomiting. Micturition and defecation were normal. The patient and her family did not have any history of malignancy. Through physical examination, tenderness was found on the lower left abdomen. However, there was no sign of appendicitis. Hence, abdominopelvic ultrasonography was carried out; it showed biometry in accordance to a 16-17 WGA, but both ovaria were difficult to assess. An emergency laparotomy was performed and gravid uterus was found with a ruptured cyst originating from enlarged left ovary. Moreover, a biopsy was taken from the ruptured tissue. Due to massive bleeding, an abdominal packing was performed. The packing was removed two days after and the pathology results revealed a yolk sac tumor. Three weeks after surgery, once the patient was stabilized, she was sent to our center, the national referral hospital.

At our outpatient clinic, the patient came as an underweight pregnant woman (body mass index 16kg/m^2) on her 19 WGA, singleton, live fetus, with unresolved abdominal pain. Upon ultrasonogram examination, an inhomogeneous solid mass was found on the left adnexa with a size of 93×41×71 mm (Figure 1), and the right ovary was found normal. The patient's LDH and AFP levels were 545 U/L and 17.626 ng/mL, respectively. At this point, our management was to give chemotherapy to the patient.

The first-line regiment for yolk sac tumor chemotherapy is bleomycin/etoposide/cisplatin (BEP regiment); unfortunately, we were unable to provide the treatment due to the patient's financial problem as she was not covered by the national insurance. Thus, we had to treat the patient with the second-line regiment: carboplatin and paclitaxel for three cycles. The first cycle was given on the patient's 20 WGA. After the second cycle (on her 23 WGA), AFP level was reduced to 6.681 ng/mL, and after the third cycle (on her 26 WGA), AFP level was 1.984 ng/mL.

On the 29th WGA, we found the fetal weight was on the 10th percentile with no sign of placental-fetus hypoperfusion. The patient was treated with high-calorie intake, high protein diet, and close monitoring for laboratory examination. On the 33rd WGA, the fetal weight was on the 25th percentile (estimated fetal weight (EFW) of 1900 gram) with no placental-fetus hypoperfusion. On the 35th WGA, the fetal weight did not increase

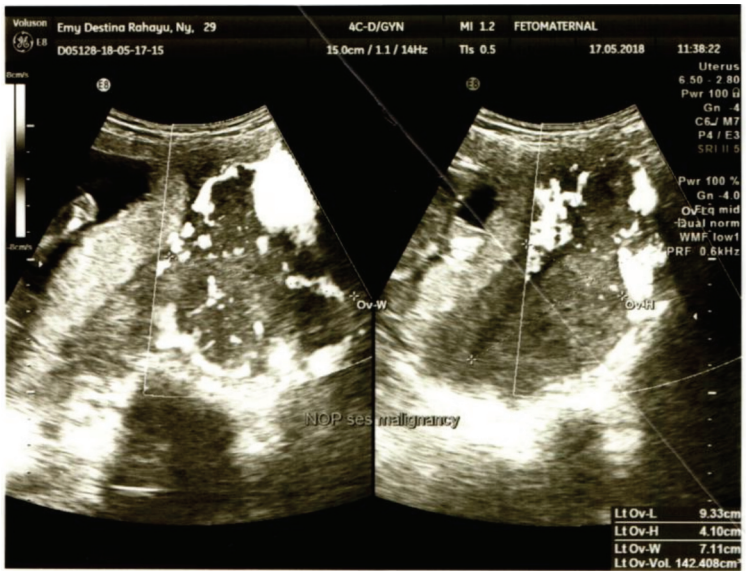

Figure 1. This figure shows the ultrasound examination in the 19th gestational week which showed a homogenous solid mass in the left adnexa measuring 93×41×71 mm.

(EFW of 1900 gram), and the fetus was diagnosed with IUGR. Lung maturation protocol and nutritional support were directly administered to the mother; two days later, the baby was delivered through C-section followed by optimally debulked laparotomy, total hysterectomy, bilateral salphingo-oophorectomy, omentectomy, and rectosigmoid tumor resection. A 1.750gram baby boy was born with a body length of 45cm, Apgar score of 8/9, and Ballard score 36 weeks.

During surgery, we found a cystic mass with a size of 80×50×50 mm^3 on the posterior of the uterus originating from the left ovary. There were multiple tumor implants on rectosigmoid with a smallest and largest diameter of 10mm and 30mm, respectively. Through further exploration, we found a tumor implanted on the omentum with 30 mm in diameter. No mass was found on the liver, spleen, and appendix (Figure 2).

Discussion

In a population-based study of 4.846.505 obstetrical patients from 1991 to 1999, 9.375 pregnant women (0.2%) were diagnosed with ovarian mass associated with pregnancy. 87 patients with ovarian cancers (0.93% found to be adnexal mass) were identified in the California Cancer Registry database, and 39% of those were diagnosed with germ cell tumors.[6] The growth of the mass was usually asymptomatic and coincidentally found through ultrasonography screening on the first trimester or through an enlarged abdomen complaint. The chronic symptoms or sudden onset might be present as the pain is caused by rupture, infection, torsion, venous congestion, or hemorrhage of the cyst.[3] Apart from the risk of malignancy, masses growing on the second trimester are at risk of torsion (6%-20%), labor obstruction, or abnormal fetal positioning.

In our case, the tumor ruptured initially in the district hospital, resulting in acute abdomen. A similar rupture of ovarian yolk sac tumor was reported to be associated with blunt trauma.[7] Another publication reported a ruptured ovarian endodermal sinus tumor during pregnancy and the management was dependent on the case.[8]

The combination of five-day BEP regiments is the standard chemotherapy for non-epithelial ovarian cancer [III, A].[9] The BEP was reported to increase the five-year survival rate for over 80%.[10] The other alternative for GCTs is carboplatin/paclitaxel adjuvant chemotherapy regimens for six cycles [III, B].[9] In our case, the chemotherapy was given prior to the optimally debulked surgery for three cycles as neoadjuvant chemotherapy (NACT). A significantly better progression-free survival was reported for advanced-stage ovarian yolk sac tumor size >20 cm patients with NACT compared with those undergoing primary debulking surgery; residual disease >2 cm was the independent risk factor of

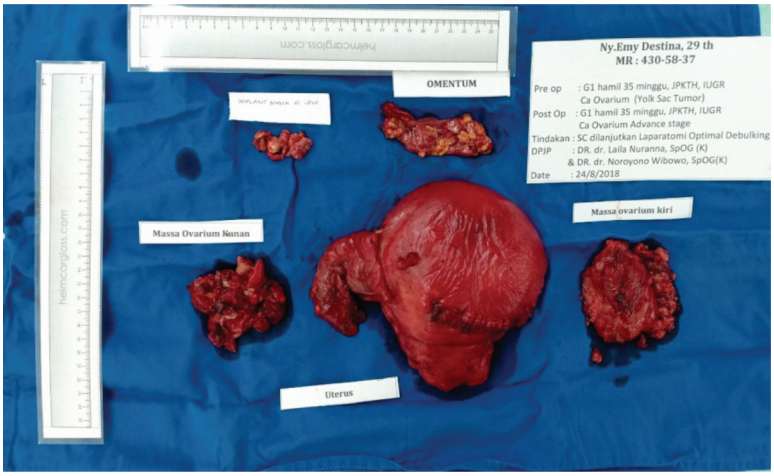

Figure 2. Specimen after laparotomy and optimal debulking surgery which included uterus, bilateral salphingoovarii, omentum, and the tumor implanted on rectosigmoid.

relapse.[11]

Teratogenic effects of both paclitaxel and carboplatin chemotherapy have been reported in several publications.[12-14] However, based on one report, these agents could be given after the period of organogenesis. The mother had evidence of persistent disease at delivery but limited to the remaining ovary.[15] As in our case, three cycles of NACT were given after 20 WGA and the complication was IUGR. We considered the condition to happen due to multifactorial aspects, including the nutritional condition of the mother, chronic illness, and side-effects of chemotherapy.

Fertility-sparing surgery should also be considered in advanced stages GCTs as curability rates remain high [IV, B]. The aim of surgery is to remove as many gross tumors as possible.[9] However, this condition can only happen if there is no delay in chemotherapy after surgery because this tumor is highly chemosensitive but grows rapidly and, possibly, repeatedly. In our case, we decided to perform optimally debulked surgery to hinder the chemotherapy delay since the patient was in advanced stage condition. It is undeniable that in such a limited-resource system, access to ideal treatment may be inadequate.[16] Furthermore, it might be difficult for the patient to reach a tertiary hospital due to transportation barriers and financial problems. This may result in ignorance and a lack of compliance on the patient's part. It is mandatory for the clinician to make a wise judgment based on available resource for a better patient outcome.

Acknowledgement

We would like to acknowledge all staff members of the Obstetrics and Gynecology Department Faculty of Medicine, Universitas Indonesia, and Dr. Cipto Mangunkusumo Hospital, who contributed to this manuscript.

Informed Consent

The patient was informed and she agreed that her case be published for academic purposes.

Conflicts of Interest

None declared.

References

1. Gatta G, van der Zwan JM, Casali PG, Siesling S, Dei Tos AP, Kunkler I, et al. Rare cancers are not so rare: the rare cancer burden in Europe. *Eur J Cancer.* 2011;47(17):2493-511. doi: 10.1016/j.ejca.2011.08.008.
2. Shaaban AM, Rezvani M, Elsayes KM, Baskin H Jr, Mourad A, Foster BR, et al. Ovarian malignant germ cell tumors: cellular classification and clinical and imaging features. *Radiographics.* 2014;34(3):777-801. doi: 10.1148/rg.343130067.
3. Hoover K, Jenkins TR. Evaluation and management of adnexal mass in pregnancy. *Am J Obstet Gynecol.* 2011;205(2):97-102. doi: 10.1016/j.ajog.2011.01.050.
4. Leiserowitz GS. Managing ovarian masses during pregnancy. *Obstet Gynecol Surv*. 2006;61(7):463-70. doi: 10.1097/01.ogx.0000224614.51356.b7.
5. Telischak NA, Yeh BM, Joe BN, Westphalen AC, Poder L, Coakley FV. MRI of adnexal masses in pregnancy. *AJR Am J Roentgenol.* 2008;191(2):364-70. doi: 10.2214/AJR.07.3509.
6. Bereck JS, Hacker NF. Bereck and Hacker's gynecologic oncology. 5th ed (e-book). Philadelphia, USA: Lippincott Williams and Wilkins; 2010.
7. Chen CF, Wong WY, Chuang CH, Yeh YS, Tsai KB, Wang JY. Ruptured ovarian yolk sac tumor combined with hemoperitoneum in a young girl with abdominal blunt injury. *Genom Med, Biomarkers, and Health Sci.* 2012;4:76-8. doi:10.1016/j.*gmbhs*.2012.04.011.
8. Benjapibal M, Chaopotong P, Leelaphatanadit C, Jaishuen A. Ruptured ovarian endodermal sinus tumor diagnosed during pregnancy: case report and review of the literature. *J Obstet Gynaecol Res.* 2010;36(5): 1137-41. doi: 10.1111/j.1447-0756.2010. 01254.x.
9. Ray-Coquard I, Morice P, Lorusso D, Prat J, Oaknin A, Pautier P, et al. Non-epithelial ovarian cancer: ESMO Clinical Practice Guidelines. *Ann Oncol.* 2018; 29(Supp 4): iv1-18. doi: 10.1093/annonc/mdy001.
10. Rai C, Gaikwad HS, Gupta R. Rare incidence of yolk sac tumor in pregnancy posing management challenge: a case report. *Int J Reprod Contracept Obstet Gynecol.* 2017;5(8):3. doi: 10.18203/2320-1770.ijrcog20162681.
11. Lu Y, Yang J, Cao D, Huang H, Wu M, You Y, et al. Role of neoadjuvant chemotherapy in the management of advanced ovarian yolk sac tumor. *Gynecol Oncol.* 2014;134(1):78-83. doi: 10.1016/j.ygyno.2014.02.029.
12. Kai S, Kohmura H, Hiraiwa E, Koizumi S, Ishikawa K, Kawano S, et al. Reproductive and developmental toxicity studies of paclitaxel. (I)--Intravenous administration to rats prior to and in the early stages of pregnancy. *J Toxicol Sci.* 1994;19 Suppl 1:57-67. doi: 10.2131/jts.19.supplementi_57.
13. Kai S, Kohmura H, Ishikawa K, Makihara Y, Ohta S,

Kawano S, et al. Teratogenic effects of carboplatin, an oncostatic drug, administered during the early organogenetic period in rats. *J Toxicol Sci.* 1989;14(2):115-30. doi:10.2131/jts.14.115.

14. Shamkhani H, Anderson LM, Henderson CE, Moskal TJ, Runowicz CD, Dove LF, et al. DNA adducts in human and patas monkey maternal and fetal tissues induced by platinum drug chemotherapy. *Reprod Toxicol.* 1994;8(3):207-16. doi: 10.1016/0890-6238(94)90004-3.
15. Mendez LE, Mueller A, Salom E, Gonzalez-Quintero VH. Paclitaxel and carboplatin chemotherapy administered during pregnancy for advanced epithelial ovarian cancer. *Obstet Gynecol.* 2003;102(5 Pt 2):1200-2.
16. Barrett DH, Ortmann LH, Dawson A, Saenz C, Feisa A, Bolan G. Public health ethics: Cases spanning the globe. In: Selgelid MJ, editor.Switzerland: Springer; 2016.