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Case report

Management of a rapidly enlarging new adnexal mass: a rare case of desmoplastic small round cell tumor of the ovary arising in pregnancy

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ABSTRACT

Background: Desmoplastic small round cell tumor (DSRCT) is an extremely rare sarcomatous tumor, which is most commonly seen in men. Clinicians managing a patient with a rapidly enlarging mass in pregnancy should be aware of the risk for malignancy.
Case: A 31-year-old woman was found to have a newly enlarged ovarian mass in the second trimester. She subsequently underwent a laparotomy for removal, with chemotherapy for presumed poorly differentiated ovarian malignancy. Ultimately she was diagnosed with a desmoplastic small round cell tumor of the ovary and had progression at time of delivery. Following cesarean delivery, she had a tumor reductive surgery. She has completed 12 cycles of intensive chemotherapy and is alive with disease at 14 months.
Conclusion: Care should be taken not to delay evaluation of a rapidly enlarging mass in pregnancy. While this tumor type is extremely rare, a malignancy in pregnancy must be ruled out in this clinical scenario.

Adnexal mass in pregnancy is an uncommon, but not rare occurrence with approximately 1 in 600 pregnancies being affected. Rapidly enlarging masses, a mass > 8 cm in size, and those with complex features warrant surgical intervention in pregnancy. This is not only to rule out malignancy, but also to avoid acute complications like ovarian torsion (Horowitz, 2011). Most often these newly diagnosed adnexal masses are benign (Smith et al., 2001).

In contrary, newly diagnosed ovarian malignancy in pregnancy is exceedingly rare, with estimated rate of 1 in 10,000 pregnancies (Leiserowitz et al., 2006). Tumors arising in the ovary during pregnancy are most often early-stage germ cell, sex-cord stromal, or borderline tumors. Rarely will an advanced epithelial lesion be encountered, and this is related to age of onset (Leiserowitz et al., 2006). With the relative rarity of this event, a high index of suspicion is warranted in pelvic masses that display aggressive features.

We present a case of a newly diagnosed rare sarcoma arising from the ovary that was successfully removed antepartum, and with a short interval recurrence prior to delivery.

Case: A 31-year-old woman, gravida 2 para 1, presented to her OB office for routine first prenatal visit at 7 weeks gestational age. A pelvic exam was completed without any adnexal pathology and she underwent a dating trans-vaginal ultrasound which showed a 7-week fetal pole with cardiac activity; as well as normal adnexa with the right ovary measuring 2.8 cm × 2.5 cm and the left ovary measuring 3.16 cm × 2.95 cm.

Her obstetric history consisted of one prior cesarean delivery at 37 weeks due to mild pre-eclampsia. She reported no history of abnormal Pap smear or sexually transmitted infection. She did have a past history of oral contraceptive pill use. She denied any family history of breast, ovarian, cervical, uterine, or colorectal cancer.

On routine anatomy ultrasound at 19 weeks she was noted to have a large 10.8 × 11.6 × 10.5 cm lobular, heterogeneous mass in the right adnexa. Repeat ultrasound at 23w0d showed marked enlargement of the mass now to at least 17 × 18 × 10.7 cm. Maternal fetal medicine consultation recommended an abdominal/pelvic MRI to better characterize the mass. In addition, she was initiated on labetalol due to continued elevations in her blood pressure. The pregnancy was also complicated with type A2 gestational diabetes mellitus.

A non-contrast MRI of the abdomen and pelvis revealed a 20.5 × 12 × 16.3 cm mass in the right adnexa, abutting the uterus, and not separate from the ovary (Fig. 1). The left ovary appeared anatomically normal. There was also lymphadenopathy adjacent to the IVC and aorta measuring 2.6 × 1.9 cm.

Following the MRI, the patient completed a consultation with gynecologic oncology. Tumor markers drawn showed a CA-125 was 89 U/mL, AFP was 137 ng/mL, and Inhibin A/B were within normal levels.

The patient underwent exploratory laparotomy at 27w2d gestation. Continuous fetal monitoring was completed during this procedure with

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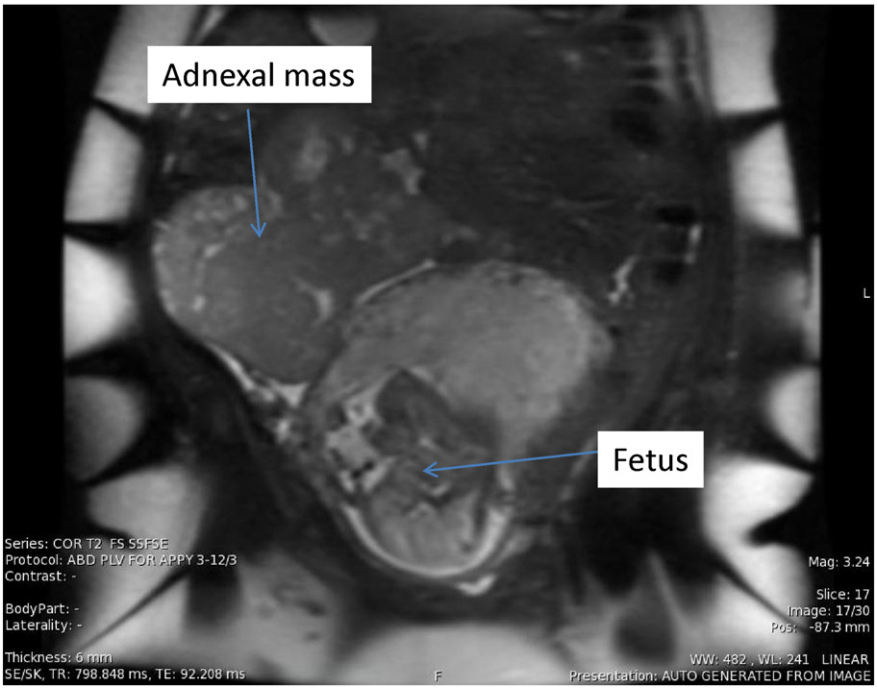

Fig. 1. Non-contrast coronal T2 image showing the large heterogeneous mass abutting the uterus with the fetal head in view (arrows).

sterile covering for fetal Doppler. The procedure entailed removal of the right ovary and tube, which was described as a 20 cm right adnexal mass that entirely replaced the ovary (Fig. 2). Frozen section of the tumor was reported as a granulosa cell tumor. A modified staging procedure then took place to include a partial omentectomy, as well as debulking a large isolated 5 × 3 cm pre-caval lymph node. Fetal well-being was reassuring throughout the procedure. There was no evidence of disease elsewhere on peritoneal surfaces, uterine body, or left ovary.

Her post-operative course was complicated by a post-operative ileus which required NG tube management for resolution. She also developed leukopenia during her hospitalization, which was thought to be secondary to medication effect, possibly from an Indocin course she was given for tocolysis following the procedure. Her leukopenia recovered prior to discharge. She was also anemic following surgery and was transfused two units of packed red blood cells prior to discharge. She was discharged home on post-operative day 6 in stable condition.

The initial pathology report of the tumor yielded a diagnosis of poorly differentiated carcinoma of unknown primary. The tumor described histologically is as follows: right ovary is replaced by a poorly-differentiated malignant neoplasm, characterized by sheets, nests and cords of pleomorphic cells within a fibrous stromal background (Fig. 3). The tumor immunohistochemistry was inconclusive. Tumor tissue was sent for review by an expert pathologist. While further staining did not yield a definitive diagnosis, the expert pathologist recommended the tumor be sent for FISH analysis.

Completion of metastatic work up included a CT of her chest and a breast mammogram. The chest CT was negative for metastasis and a mass noted on mammogram was negative on biopsy. At 30w3d decision was made to initiate chemotherapy for presumed stage III poorly differentiated ovarian carcinoma or tumor of unknown primary with paclitaxel and carboplatin. Following her second cycle of carboplatin/

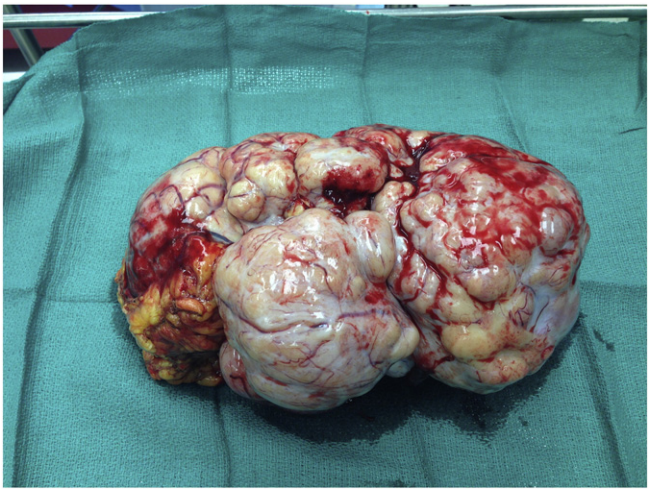

Fig. 2. Gross image of tumor obliterating normal ovary removed at 27 weeks gestation.

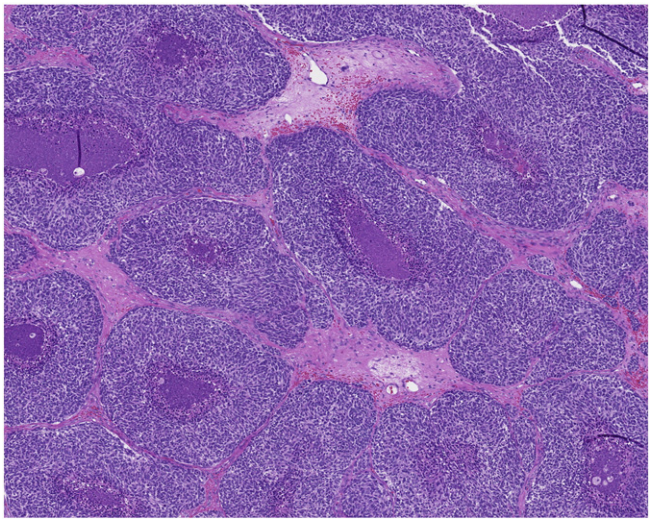

Fig. 3. Microscopic view of desmoplastic small round cell tumor on 20× brightfield with H&E stain.

paclitaxel the pathology was finalized as DSRCT after FISH analysis revealed EWSR1-WT1 fusion t(11;22)(p13;q12) gene mutation.

At 35w0d gestation, she went for initial consultation with medical oncology for determination of treatment plan following her pregnancy. MFM specialists, medical and gynecologic oncology, and her primary obstetrician made a delivery plan for repeat cesarean delivery at 38 weeks (approximately 3 weeks after cycle 2) with planned completion hysterectomy, left salpingo-oophorectomy.

The patient underwent a repeat cesarean section. Infant delivered had APGARs of 9 and 9. She then underwent a total hysterectomy, left salpingo-oophorectomy, and tumor debulking. Intraoperative findings included large tumor plaques on the uterus, small implants on the left ovary, small peritoneal adhesive disease, as well as large retrocaval nodal tumor extending superiorly beyond the renal vasculature resulting in a suboptimal debulking.

Her oncologic care was transitioned to the sarcoma medical oncology team. She was initiated on a complex inpatient regimen of vincristine, doxorubicin, cyclophosphamide, with ifosfamide and etoposide. She remained on this for 12 cycles. Recently her scans showed stable retroperitoneal nodular disease, and she halted the current chemotherapy regimen. Further surgical management of residual disease has been considered along with radiation, and she is currently being maintained on pazopanib. She is alive with disease 14 months from initial diagnosis.

Comment: This case highlights a rare sarcomatous tumor arising from the ovary in a pregnant female. Approximately 850 DSRCT have been reported in the literature (Mora et al., 2015). It was first described as a separate clinical entity in 1989 by case report by Gerald and Rosai, and confirmed in a case series in 1991 (Gerald et al., 1991). These tumors are similar to other small cell sarcomas including Wilms Tumor and Ewing sarcoma. However, definitive diagnosis for this tumor can be confirmed by florescence in-situ hybridization (FISH) as DSRCT is characterized by a unique genetic mutation: EWSR1-WT1 fusion t(11;22)(p13;q12) (Mora et al., 2015). The tumor is most often found in the pediatric population, with a male predominance, and patients are often diagnosed at an advanced stage with extensive peritoneal metastases. Ovarian involvement has been described in the literature (Nakayama et al., 2013).

One prior case report was found describing DSRCT in pregnancy (Church et al., 2006). This case was found incidentally at time of cesarean delivery due to arrest of labor. In the presented case, we describe full antepartum management of this rare tumor. DSRCT exhibit aggressive behavior as evidenced in this case by rapid peritoneal spread and new development of retrocaval adenopathy in the 10 weeks between primary resection and the time of delivery and secondary surgery despite chemotherapy. Treatment often consists of multi-modal therapy with surgery and chemotherapy. VAC/IE is a common first line regimen, with a high initial response rate (Kushner et al. 1996). Patients who undergo a complete surgical debulking with chemotherapy have a 3-year survival of 58% (Lal et al., 2005). Unfortunately, patients who have persistent disease following initial surgery do much worse, with no survivors at 3 years in the same study.

Our report highlights three key points to consider. First, the optimal timing for surgical intervention during pregnancy is during the (early) second trimester remote from fetal viability. Timely management of a rapidly enlarging ovarian mass is essential to improving the chance for an early stage diagnosis of any new ovarian malignancy and improves the chance of complete resection. Accounting for the extreme rarity of the tumor presented in our case, we must remember that other types of primary ovarian neoplasms are not as rare, and patients can benefit greatly from early surgical care. Second, chemotherapy in pregnancy can be considered and risks should always be weighed against benefits of early treatment. Certain platinum based regimens, such as carboplatin and paclitaxel, are considered safe during the second and early third trimester (Cardonick and Iacobucci, 2004). Care must be taken to avoid chemotherapy nadirs (neutropenia, thrombocytopenia) in the mother and the fetus close to delivery, with the last cycle typically given no later than 35 weeks if a term delivery is anticipated. Finally, advanced imaging in pregnancy is an option when concern for an adnexal mass increases. If ultrasound imaging reveals new complexity or considerable growth, MRI is recommended as a safe alternative to CT and should be promptly acquired.

Conflict of interest statement

The authors of this manuscript report no conflict of interest with regard to the subject matter at hand.

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