Pregnancy Complicated by Ovarian Cysts

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ABSTRACT

The incidence of adnexal masses during pregnancy varies between 0.2% and 2%, with the majority of these tumors being benign and a 1% to 6% chance of malignancy. Due to widespread use of ultrasound during the first trimester, it is quite common to detect incidental ovarian cysts. Once a tumor is identified, the primary goal is to determine whether it is benign or malignant. The ultrasound feature helps to determine that with a minimal help with the tumor markers, as it is altered due to pregnancy. Then, the next step is to decide if surgical intervention is necessary. If surgery is required, it is important to determine the safest time to perform it and whether to opt for laparotomy or laparoscopy. We present two case reports of pregnancies with ovarian cysts, both diagnosed incidentally, with the timing of the operation chosen based on the cyst type, size, symptoms, and gestational age.

KEY WORDS

Gravidity, Mucinous cystadenoma, Ovarian cyst, Pregnancy maintenance

INTRODUCTION

Routine ultrasound scans in modern antenatal care are very effective at detecting ovarian cysts that might otherwise go unnoticed. The occurrence of adnexal masses during pregnancy ranges from 0.2% to 2%, with most of these tumors being benign and a 1 to 6 % chance of malignancy.[1,2] Management primarily depends on factors such as the tumor's size, type, and origin, gestational age, presenting symptoms, and the overall medical condition of these pregnant women. Here are two case reports on pregnancy with ovarian cysts managed according to their type, size, symptoms and gestational age.

CASE REPORT

Case I

Huge Ovarian Cyst Managed Surgically in second trimester

A 22-year-old primigravida presented to the antenatal clinic of Dhulikhel Hospital at 6 weeks' gestation, spontaneously conceived, for her first antenatal checkup. She complained of mild nausea but no vomiting. On examination, she had a mass bulging from the pelvic cavity, which was about 18 weeks in size. Transabdominal ultrasonography revealed a single intrauterine viable fetus, which was six weeks of gestation, along with a large left ovarian cyst of size 15.7 X 9.2 cm with low echogenicity, which was suggestive of cystadenoma and no abdominal ascites. Tumor markers were sent, which were CA125: 143.2 U/mL, CEA: 1.79 ng/mL, CA 19.9: < 2 U/mL, and LDH: 392 U/L.

She was counseled regarding the cyst and was planned for cystectomy at her second trimester or at any period of time if there were any signs of torsion or rupture. She was planned for exploratory laparotomy at 18 weeks gestation. Throughout this time her antenatal period was uneventful. However, the mass was palpable till her epigastric region. The ultrasound showed an increased size of 18.8 X 14 X 12 cm, a cystic lesion with a few smaller lobulated cystic structures separated by thin internal septation without internal vascularity, and a few low echoes within the cystic lesion (Fig. 1).
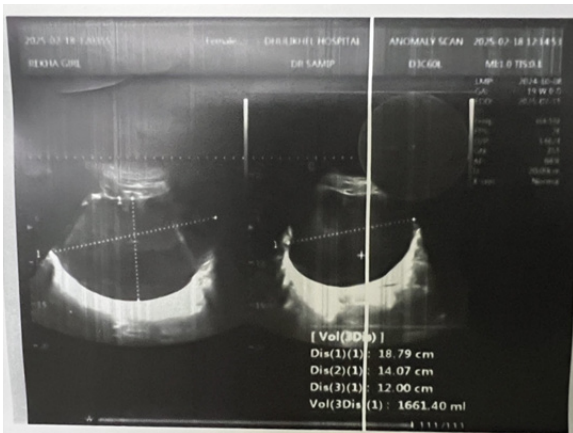
Figure 1. A ultrasound report of the cyst done two days prior to operation

An exploratory laparotomy was performed at 18 weeks and two days. Under general anesthesia, a midline incision was made. There was a large multiloculate ovarian cyst twisted once in its pedicle seen from the right ovary with a normally appearing contralateral ovary (Fig. 2). There was no ascites; her omentum and upper abdomen looked grossly normal. Ovarian cystectomy with conservation and reconstruction of the right ovary was done. The size of the cyst after draining almost one liter of cystic fluid measured 22 X 16 cm (Fig. 3). The fluid content was brownish in color. The patient tolerated surgery well, and postoperative recovery was unremarkable. Fetal viability was documented. Prophylactic tocolytic was given. The patient was discharged home on the fourth postoperative day.

Figure 2. Right ovarian cyst after draining almost one liter of brown colored fluid content, twisted once in its pedicle
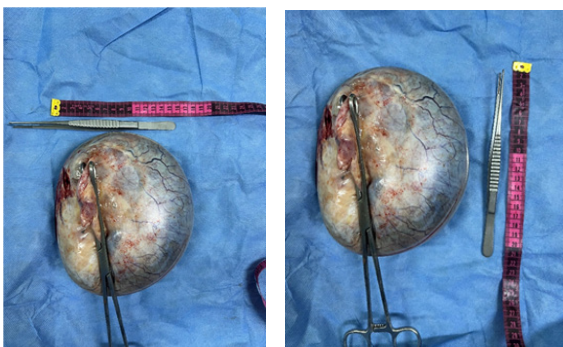

Figure 3. The ovarian cyst measured are one liter of fluid being drained

According to pathology report, cut sections showed: cyst wall lined by mucin-secreting columnar epithelium with a focal area showing nuclear elongation and stratification. Underlying fibro-collagenous stroma shows numerous glands lined by columnar epithelium with apical mucin and luminal eosinophilic secretion, mild chronic inflammatory cell infiltrates, congested blood vessels, and areas of hemorrhage. The adjoining area shows normal ovarian parenchyma. There is no evidence of atypia. Diagnosed as mucinous cystadenoma.

Case II

Small cyst managed surgically during time of cesarean section

A 32-year-old woman (G3P1L1A1) at 8 weeks gestation came for a routine antenatal checkup following a missed period with a positive urine pregnancy test. She had no complaints. A transvaginal ultrasound confirmed the pregnancy and revealed a 5 X 5 cm anechoic cystic lesion in her right ovary. Tumor markers were within normal limits. A follow-up ultrasound at 12 weeks showed the cyst remained the same size. The patient was counseled about the cyst and informed about the signs of torsion or rupture. Since the size was small, we opted for conservative management.

She underwent an elective repeat cesarean section along with right ovarian cystectomy. It was 5 X 5 cm unilocular, with no torsion. Normal-looking fallopian tubes and contralateral normal ovary. No ascites.

According to pathology report, cut sections showed: cyst wall lined by columnar epithelium. Fibro-collagenous stroma shows mild chronic inflammatory cell infiltrates and numerous blood vessels. There is no evidence of atypia. Diagnosed as serous cystadenoma.

DISCUSSION

The most common ovarian masses during pregnancy are functional cysts, such as corpus luteum of pregnancy and follicular cysts. Other types include dermoid cysts, serous cystadenomas, mucinous cystadenomas, endometriomas, and paraovarian cysts. Among those requiring surgical management or removal during cesarean delivery are dermoid cysts (32%), being most common, followed by serous and mucinous cystadenomas (19%), endometriomas (15%), functional cysts (12%), paraovarian or paratubal cysts (6%), and malignancies (2%).[3]

Large ovarian masses present as a pressure or chronic and acute abdominal pain due to torsion, rupture, or hemorrhage. Pain is the most common symptom among those who are symptomatic.[4] Most ovarian masses in pregnant women are asymptomatic and are discovered incidentally during routine obstetric ultrasounds, as seen in both of our patients.

Initial evaluation should include a thorough history and physical examination, which encompasses bimanual and rectovaginal evaluations, followed by an ultrasound. Ultrasound is highly accurate, cost-effective, readily accessible, and safe for use during pregnancy. The ultrasonographic features of adnexal masses in pregnant women are similar to those seen outside of pregnancy.[5]

International Ovarian Tumor Analysis (IOTA) Simple Rules Risk Assessment can be used to define malignant and benign ultrasound features of ovarian mass (Table 1). If one or more M features are present in the absence of B feature, the mass is classified as malignant. If one or more B features are present in the absence of M feature, the mass is classified as benign. If both M and B features are present, or if no B or M features are present, the result is inconclusive, and a second stage test is recommended.

Table 1. International Ovarian Tumor Analysis simple rule risk assessment.

Ultrasound feature	
For predicting a benign tumor (B feature)	
B1	Unilocular
B2	Presence of solid components, of which largest solid component has largest diameter < 7 mm
B3	Presence of acoustic shadows
B4	Smooth multilocular tumor with largest diameter <100mm
B5	No blood flow (color score 4)
For predicting a malignant t tumor (M feature)	
M1	Irregular solid tumor
M2	Presence of ascites
M3	At least four papillary structures
M4	Irregular multilocular solid tumor with largest diameter > 100 mm
M5	very strong blood flow (color score 4)

While ultrasound typically provides adequate information, MRI can serve as a valuable secondary imaging method. MRI is recommended when ultrasound results are inconclusive, when masses are too large to be fully assessed by ultrasound, or when there is a high likelihood of malignancy to evaluate potential extra-ovarian spread.[1] Gadolinium-based contrast material should be avoided due to the lack of demonstrated fetal safety.

Tumor markers are less reliable in pregnant patients compared to non-pregnant patients, with normal ranges often showing varying and sometimes contradictory results.[6] However, if there is a strong suspicion or identification of malignancy, tumor markers can still provide valuable information.

Cancer antigen 125 (Ca 125) is a tumor marker that is elevated in ovarian malignancies. However, during pregnancy, Ca 125 levels peak in the first trimester (ranging from 7 to 251 U/mL) and then consistently decrease throughout the pregnancy. Elevated Ca 125 levels between 15 weeks' gestation and delivery (1000 to 10,000 U/mL) should raise concerns for a potential tumor, as they cannot be attributed to pregnancy.[7] Other tumor markers affected by pregnancy include hCG, alpha-fetoprotein, and inhibin A.

Serum tumor markers that remain unaffected by pregnancy include inhibin B, lactate dehydrogenase, human epididymis protein 4, cancer antigen 19-9, carcinoembryonic antigen, and anti-Müllerian hormone.[6,8] However, pregnancy-associated conditions can cause alterations in lactate dehydrogenase levels, which may be elevated in cases of preeclampsia.[6,9] Additionally, alpha-fetoprotein levels are often elevated in pregnancies complicated by neural tube defects. The timing of surgery should be carefully decided as both early and late interventions can result in adverse maternal and fetal outcomes. Early interventions may increase the risk of miscarriage and loss of luteal function, while late interventions can lead to complications such as torsion, rupture, bleeding, malignancy progression, or premature labor.[10] Acute abdomen with symptoms suggestive of torsion, rupture, or malignancy requires immediate surgical intervention, regardless of gestation period.[10,11] For cysts larger than 10 cm, even if asymptomatic, surgical removal is advisable due to the significant risk of torsion and labor obstruction.[12,13]

Elective operation is ideally performed in the second trimester. Functional cysts typically resolve by itself by the 14th to 16th week of gestation. The risk of pregnancy loss is lower when surgery is performed in the second trimester compared to the first trimester. Non-obstetric surgical interventions during the first trimester have been reported to result in miscarriage in approximately 10.5% of patients.[14] By this time, fetal organogenesis is also complete, reducing the risk of medication-induced teratogenesis. Additionally, pregnancy losses due to fetal abnormalities are more likely to have occurred already, preventing them from being mistakenly attributed to surgical intervention. Furthermore, adnexal resection in the second trimester does not impact progesterone levels, as the placenta has taken over the hormonal functions of the corpus luteum. The smaller size of the early second-trimester uterus ensures it does not obstruct the abdominal operative field, and the risk of preterm labor is lower when surgery is performed in the second trimester compared to the third trimester.[15]

Traditionally, laparotomy has been the preferred approach for treating ovarian tumors. However, there is growing interest in laparoscopic treatment, especially in the 1st and 2nd trimesters, resulting in more reports of favorable outcomes. A meta-analysis comparing laparoscopy and laparotomy for adnexal masses in pregnancy showed low-grade evidence that laparoscopic surgery is a feasible option. The laparoscopy group experienced reduced operative blood loss and shorter hospital stays.[16] Laparotomy is preferred when anatomical features, such as the size of the

uterus and mass, make laparoscopy challenging, or when there is a lack of expertise in laparoscopic surgery.[17]

Managing an ovarian cyst during pregnancy, which is asymptomatic, necessitates expert clinical judgment to balance the pros and cons of intervention. Laparotomy is still the gold standard, with laparoscopy being a new emerging option.

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