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Case Series

A case series of fetal ovarian cysts: A common occurrence in the modern era

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Abstract

Fetal ovarian cysts are the most frequent type of abdominal tumor found in the female fetuses. They are often described in the third trimester. High amounts of gonadotropins and estrogens found in the placenta or maternal bloodstream during pregnancy stimulate the fetal ovaries and result in the development of fetal ovarian cysts. Though uncommon in the last decade, it has become more common in the modern era with the routine practice of vigilant antenatal ultrasound. Here we present 3 cases of fetal ovarian cysts, successfully managed antenatally and followed for 1 year post delivery. All the three cases were identified during routine antenatal ultrasound imaging, 2 during third trimester growth scan and 1 during second trimester ultrasound targeted for anomalies. None of them required any kind of intervention antenatally except for a regular follow up scan. Similarly, postnatal follow up was done and the cysts regressed on its own by 1 year. None had any complications described in literature during the follow up period. Vigilant ultrasound imaging and follow up remains the standard of the treatment of fetal ovarian cysts.

Keywords: Ovarian cyst, Gonadal cyst, Fetal cyst, Fetal ovarian cyst.

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1. Introduction

Fetal ovarian cysts are often detected in the third trimester, after 29 weeks of pregnancy.[1] Their incidence is 1 in every 2,500 live births[2] and they lead as the most common type of abdominal tumor in female fetuses.[3] Fetal gonadal cysts are not an uncommon diagnosis in the modern era with the advent of advanced antenatal ultrasound imaging. This is causally related to standard mandatory ultrasound imaging procedures worldwide, with little variation between nations.[4]

The condition is mostly caused by the stimulation of the fetal ovary by both placental and maternal hormones. This explains why most of these cysts are benign follicular or functional theca-lutein.[5] Given that elevated levels of β-hCG (Human Chorionic Gonadotropin) are recognized to cause changes in the anatomy of the mother's ovaries, it is reasonable to extend this causality to fetal ovarian cysts.[6] Both fetal and maternal ovarian cysts can occur together and may have a similar hormonal cause.[7]

Although most cysts are benign, and resolve spontaneously, there are fatal complications like compression of adjacent structures, torsion, rupture, hemorrhage and fetal anemia during antenatal and postnatal period. Currently, there is no consensus on the appropriate management of this condition [8-16] Therefore, the treatment of fetal ovarian cysts is still challenging and requires a multidisciplinary team.

Here we present 3 cases of fetal ovarian cysts, successfully managed antenatally and followed for 1 year post delivery.

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2. Case Series

2.1. Case 1

A 33 year old $G_2P_1L_1$ Previous Caesarean, conceived after ovulation induction with letrozole. TIFFA demonstrated a normal fetal anatomy and fetal echo done at 22 weeks of gestation was found to be normal. Fetal ovarian cyst was diagnosed during her routine antenatal ultrasound imaging done for fetal growth at 30 weeks of gestation. It was an anechoic simple cyst of 3 cm size (**Figure 1**). Other fetal organs were normal and the liquor volume was within normal limits for her gestational age. The patient was followed up with growth scans and found the size of the cyst remains the same. This indicates a lower likelihood of prenatal problems, hence a postnatal examination and follow-up were scheduled in light of this. An elective repeat cesarean section was done at 39 weeks of gestation, and a healthy female baby weighing 2.9 kg was delivered. Physical examination of the neonate was normal and ultrasound imaging showed an ovarian cyst of size 3 cm. The infant was followed up after 4 weeks, the ultrasound imaging showed normal ovaries with complete resolution of cyst.

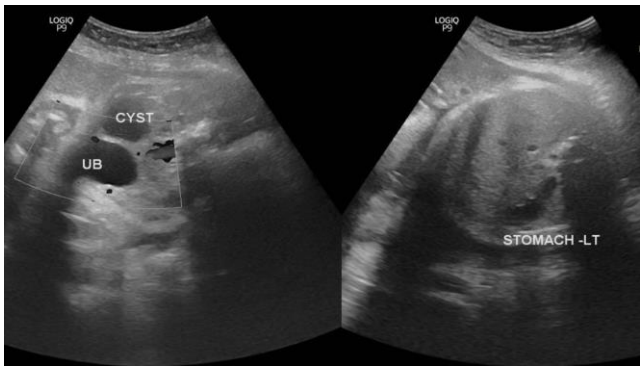

Figure 1: Antenatal ultrasound showing pelvic cyst measuring 3 x 3 cm adjacent to urinary bladder, probably ovarian origin

2.2. Case 2

A 38 year old elderly G2A1, known diabetic on insulin since conception and overt hypothyroidism. It was a spontaneous conception and blood sugar and thyroid values were under normal limits since confirmation of this pregnancy. TIFFA demonstrated a normal fetal anatomy and fetal echo done at 24 weeks of gestation was found to be normal. Her growth scan done at 28 weeks of gestation showed a pelvic cyst of size 4 cm (**Figure 2**). Considering the larger size, she was planned for serial ultrasound imaging. Since the cyst was found to be simple, without poor prognostic indicators in the serial ultrasound, postnatal evaluation of the cyst was performed. She was delivered by an emergency cesarean section at term in view of oligoamnios. After birth, there were no signs of complications such as torsion, hemorrhage and rupture. Postnatally, tumor markers were sent and Alpha Fetoprotein (AFP) was found to be elevated and the neonate was kept under close monitoring. Ultrasound imaging was done every 3 months, the cyst was regressing and completely resolved by 9 months of age (**Figure 3**-**Figure 5**). Her AFP levels became normal during follow up at 6 months of age.

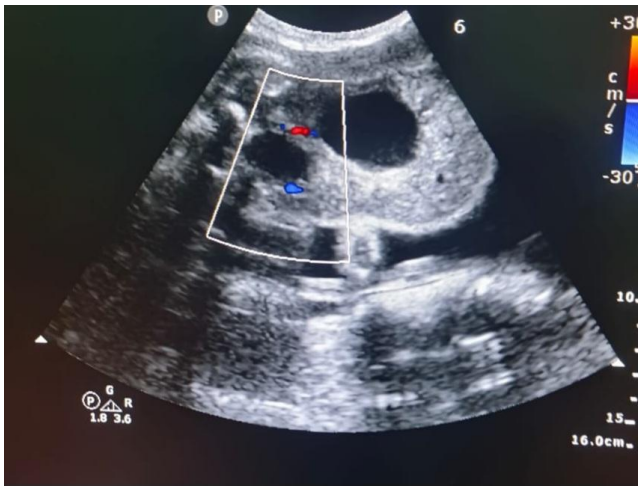

Figure 2: Obstetric ultrasound image showing fetal ovarian cyst measuring 4 x 4 cm

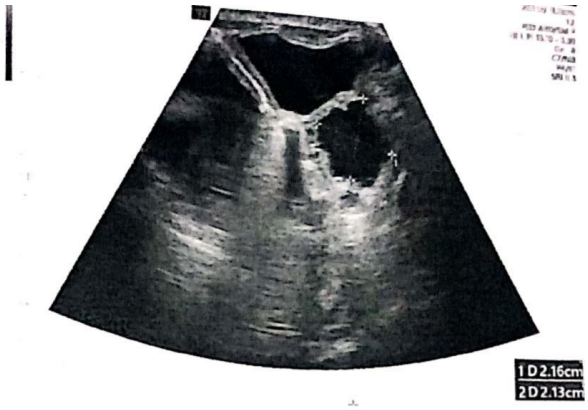

Figure 3: Postnatal follow up done at 3 months showing ovarian cyst measuring 2 x 2 cm

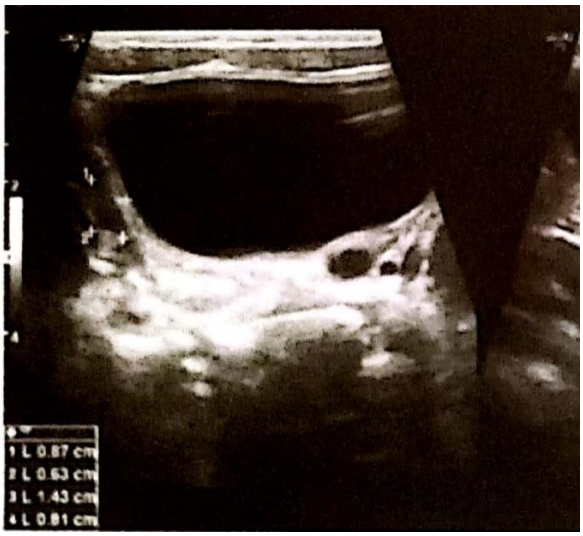

Figure 4: Postnatal follow up done at 6 months showing ovarian cyst measuring 0.87 x 0.63 cm

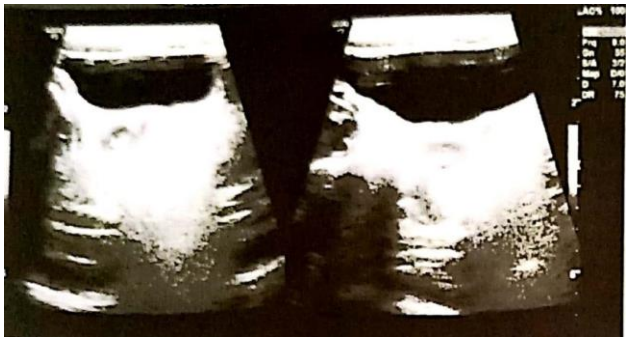

Figure 5: Postnatal follow up done at 9 months of age showing complete resolution of the cyst

2.3. Case 3

A 26 year old Primigravida with spontaneous conception and no comorbid conditions. Her scan done at 18 weeks showed a cyst, probably ovarian or renal origin. A second opinion was taken to confirm the origin from an expert team of fetal medicine specialists. Their opinion was an ovarian cyst of size 7cm (**Figure 6**) with septations and probably a complicated cyst. But there was no evidence of pressure effects and abdominal distension. Considering the complicated nature of the cyst, she was planned for close monitoring serial ultrasound imaging. She came with spontaneous labor pains at term gestation and delivered a female baby of 2.6 kg vaginally. Postnatal ultrasound showed an increase in the size of the cyst. AFP found to be elevated, kept under follow up every month and after a year the size of the cyst is almost resolved.

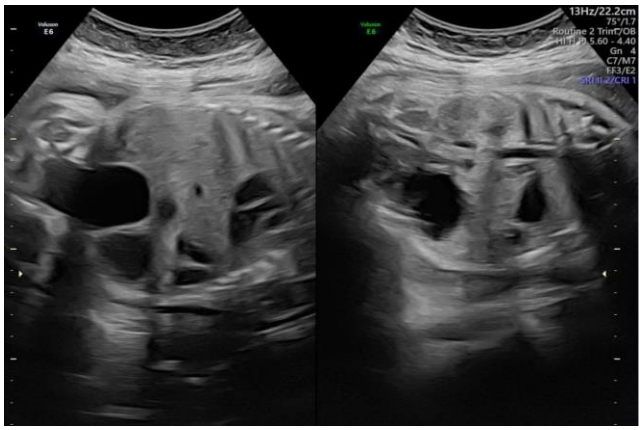

Figure 6: Ultrasound image showing a complicated fetal ovarian cyst

3. Discussion

Fetal ovarian cysts are classified as simple or complicated. The term "simple cyst" typically refers to a functioning follicular cyst. The ultrasonic features of the simple cyst are unilocular, anechoic, thin walled, circular and a diameter more than 2 cm. In contrast, cysts which are thick walled, multilocular, thick septations with heterogeneous contents are classified as complicated cysts. These types of cysts commonly result in complications.[6] If there is a suspicion of a complicated fetal ovarian cyst, it is important to thoroughly evaluate the urogenital and gastrointestinal tracts to exclude commonly related abnormalities and malignancy.

When a female fetus is diagnosed to have a cystic structure in the pelvis or lower abdomen and normal urinary and gastrointestinal systems, the possibility of this diagnosis should be taken into account.[8] Possible differential diagnosis of fetal ovarian cysts include intestinal duplication cysts, lymphangioma, renal cystic dysplasia, urachal cysts, mesenteric cysts, omental cysts, choledochal cysts, hydrometrocolpos, and other intra abdominal malignancies.[9] A definitive characteristic indicating that a fetal cyst originates from the ovary is the presence of a "daughter cyst" sign, which refers to the existence of a smaller secondary cyst within the primary cyst's cavity.[10]

The diagnosis of fetal ovarian cysts has been increasing by the rising use of routine ultrasound imaging and early diagnosis is also possible with the high resolution ultrasound imaging.[11] The first case identified by antenatal ultrasound was reported in 1975[11-17] and the earliest case recorded was in the 19th week of pregnancy and MRI can be used in difficult situations where Ultrasound evaluation is inconclusive.

When evaluating fetal ovarian cysts during pregnancy, it is important to thoroughly examine for indicators of complications. These signs may include polyhydramnios (excessive amniotic fluid) in cases of partial obstruction of the gastrointestinal tract, ascites (abnormal accumulation of fluid in the abdomen), tachycardia (abnormally fast heart rate), intracystic hemorrhage (bleeding within the cyst), or torsion (twisting of the cyst).[12]

Although most fetal ovarian cysts are benign, and mostly regress spontaneously during neonatal period, the occurrence of severe complications, such as torsion or rupture, can be life-threatening and may require immediate surgical intervention.[12-18] Furthermore, surgical intervention is advised for complicated ovarian cysts that carry a significant risk of torsion, malignancy and other complications. These issues might appear in many ways after childbirth, depending on the size of the cyst and its effect on adjacent organs.[12] Although 40% of the fetal ovarian cyst cases documented in literature required urgent surgical intervention for ovarian torsion,[12] none of our cases required emergency surgery.

The decision to do surgery was made based on the prenatal imaging appearance of the ovarian tumor and subsequent imaging evaluation after birth. In our case series, one had a cyst of 3 cm with no clinical indicator of complications, the other two had larger sized cysts but postnatal evaluation showed signs of improvement and hence advised conservative management and are still under follow-up. Demographic, clinical, ultrasonographic and other features of our patients are elaborated. (**Table 1**)

Table 1: Clinical, ultrasonographic and other features of our patients

Case No.	Gestational age at diagnosis	Antenatal period	Comorbid conditions	Mode of delivery	Intrapartum period	Neonatal transition	Resolution of cyst
1	30 weeks Simple cyst - 3 cm	Uneventful	Ovulation induced conception	Elective cesarean section	Uneventful	Nil intervention required	1 year
2	28 weeks Simple cyst, but slightly large - 4 cm	Uneventful	Elderly gravida, Overt diabetes on insulin, Hypothyroidism	Emergency Cesarean section for fetal distress	Uneventful	Elevated AFP levels	9 months
3	18 weeks Complicated cyst - 7 cm	Uneventful	Nothing significant	Spontaneous vaginal delivery	Uneventful	Elevated AFP level	1 year

Apart from these 2 modes of management, antepartum percutaneous aspiration of ovarian cysts has been employed in selected cases. Although this has been used to reduce the surgical complications in the neonate, it has its own disadvantages. Preterm labor, preterm premature rupture of membrane, prelabour rupture of membrane, intracystic haemorhhage or infection and recurrence as the causal factor persisting are the possible risks of antepartum aspiration of cysts. In spite of this, it can be employed in selected patients to reduce the symptoms. According to recommendations, antepartum aspiration of cysts may be the best option for large cysts (diameter greater than 4 cm) that distend the fetal abdomen and grow rapidly as evident by serial ultrasound imaging or for auto-amputated cysts that remain free in the abdominal fetal cavity. However, this procedure was not performed in any of our cases because none of them had the above mentioned features. Even the larger cysts (diameter more than 4 cm), neither grow and compress the adjacent structures nor distend the fetal abdomen in the serial ultrasound imaging.

Considering the mode of delivery, most of the studies recommend vaginal delivery in the absence of any aggravating factors and cesarean section is reserved only for obstetric indications. In our series, cesarean section was done in two patients for obstetric indications and one patient delivered vaginally.

There was no significant difference in socio demographic features among the cases, all conceived spontaneously except one patient conceived by ovulation induction. Among three of them, only one patient had comorbid conditions such as pregestational diabetes and overt hypothyroidism. Conservative management remained the mode of management in all our cases regardless of the size and nature of the cyst. Though complications are more with larger cysts, none of our patients had any form of surgical interventions.

Cases with similar presentation are included in this case series to emphasize the fact that confirmed and isolated ovarian cysts are mostly benign and do not require active intervention during the antenatal period and only require follow-up. Evaluation and intervention may be needed in the postnatal period. Most cysts regress by themselves after maternal hormonal influences wear off. This type of management is only for confirmed cases of ovarian cyst.

Only when there is a doubt in diagnosis, biomarkers and amniocentesis may be required.

4. Conclusion

In our limited case series, three consecutive fetal ovarian cysts managed conservatively with no further evidence of complications and no need of antepartum cyst aspiration and postnatal surgery. To sum up, although fetal ovarian cysts are the most common cysts identified during the fetal life, their incidence is found to be low. The cases that we reported in this series help us to identify the challenges associated with getting an antenatal diagnosis and the significance of close observation till term in the absence of complications. Ultimately, it emphasizes the necessity of a thorough neonatal assessment and follow up until regression.

5. Source of Funding

None.

6. Conflict of Interest

None.

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