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Case Report

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# A case series on fetal ovarian cysts

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## Abstract

**Objective:** We aimed to discuss the ultrasonographic characteristics and follow-ups of 7 fetuses which were established with the diagnosis of prenatal fetal ovarian cyst and followed up between 2012 and 2017.

**Cases:** Sonographic findings and prenatal and postnatal progress of a total of 7 cases with fetal ovarian cyst which were detected by chance during the routine gestational follow-ups performed in the third trimester of pregnancy were presented. While four of the seven cases were lost during prenatal and postnatal periods, it was observed that 3 cases persisted in their follow-ups.

**Conclusion:** Fetal ovarian cysts are the abdominal cystic masses which are diagnosed with a gradually increasing frequency. The majority of them are functional cysts. Regular follow-up of the cyst size and ultrasonographic characteristics is the most frequently used method in the approach. Waiting for follow-up and spontaneous regression in fetal ovarian cysts which do not exhibit septation and increase in the size, and have thin walls and no heterogeneous cystic content seems to be an appropriate approach.

**Keywords:** Fetal, ovarian cyst, ultrasonography.

## *Özet:* Fetal over kistleri olgu serisi

**Amaç:** Bu olgu serisi sunumunda, 2012 ve 2017 tarihleri arasında prenatal fetal over kisti tanısı alıp takip edilmiş 7 fetüsün ultrasonografik özellikleri ve takiplerinin tartışılması amaçlanmıştır.

**Olgular:** Gebeliğin son trimesterinde yapılan rutin gebelik takipleri sırasında tesadüfen saptanan toplam 7 fetal over kisti olgusunun sonografik bulguları, prenatal ve postnatal seyri sunulmuştur. Yedi olgudan dördü prenatal ve postnatal periyotta kaybolurken 3 olgunun devam eden takiplerinde sebat ettiği gözlemlenmiştir.

**Sonuç:** Fetal over kistleri her geçen gün daha çok tanı alan abdominal kistik kitlelerdir. Bu kistlerin büyük çoğunluğu fonksiyonel kistlerdir. Kistin boyutu ve ultrasonografik özelliklerinin düzenli takip edilmesi yaklaşımda en çok başvurulan yoldur. Septasyon göstermeyen, ince duvarlı, kist içeriği heterojen olmayan, boyutları artış göstermeyen fetal over kistlerinde izlem ve spontan gerileme için beklemek uygun bir yaklaşım olarak görünmektedir.

**Anahtar sözcükler:** Fetal, over kisti, ultrasonografi.

## Introduction

Fetal ovarian cysts are the abdominal cystic masses having the most frequent diagnosis during prenatal period.[1] It is usually unilateral and diagnosed in third trimester. It is considered that the hormonal stimulation of fetal gonadotropins, maternal estrogen and the placental human chorionic gonadotropins is responsible for their development. The cease of hormonal effects after labor causes ovarian cysts to shrink. Although the association between hormonal stimulation and cystic growth has been established, its etiology has not been known yet.[2]

Kidney cysts, hydronephrosis, megacystis, anorectal atresia, urachal cyst, meconium pseudocyst, hydrometrocolpos, mesenteric cyst, and liver and spleen cysts may be the reasons for the abdominal cystic masses. Therefore, such conditions should be taken into consideration during differential diagnosis. We have presented the clinical characteristics and prognosis of 7 pregnant women, who were antenatally established with fetal ovarian cyst, and discussed the prenatal and postnatal managements.

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## Case Reports

The clinical, imaging and follow-up findings of 7 cases with fetal ovarian cyst, who were diagnosed between 2012 and 2017 and followed up after the diagnoses, were assessed (**Table 1**; **Figs. 1** and **2**). In the first case, the sizes of ovarian cyst increased with 4-week periods after 32 weeks of gestation in which diagnosis was established; however, although the sonographic characteristics of the cyst did not change, the cyst size shrank to 25×25 mm at 37 weeks of gestation, and it disappeared at neonatal period. In the second, third and fourth cases, the cysts exhibited no change during pregnancy, and they regressed and disappeared at postnatal period. The fifth, sixth and seventh cases persisted after the labor and they have been still followed up.

## Discussion

Fetal ovarian cysts are the benign ovarian masses which are diagnosed with a gradually increasing frequency thanks to the advancements in ultrasonography technology. It is reported in one per 2635 pregnancies.[3] Ovarian cysts are mostly benign and functional tumors. The cause is usually follicular epithelium; however, they may also develop as theca lutein or corpus luteum cysts. While 85–90% of ovarian cysts are functions, 10–15% of them are complex (3% carcinoma, 7–12% teratoma and mucinous and serous cystadenomas).[4] Fetal ovarian cysts are usually diagnosed at the third trimester of pregnancy. A majority of the cysts shrink during pregnancy and disappear in the first few months of life. The earliest diagnosis was established on a case at 19 weeks of gestation.[5]

Fetal ovarian cysts are categorized into two groups according to their ultrasonographic characteristics, which are simple or complex and complicated or non-complicated.[1] The size, echogenicity, edges, wall thickness, septation and bilaterality are important. Ultrasound examination can be helpful to distinguish benign cysts from malign masses.

In the differential diagnosis of fetal ovarian cysts as an abdominal-pelvic cystic structure, kidney cysts, hydronephrosis, megacystis, anorectal atresia, urachal cyst, meconium pseudocyst, hydrometrocolpos, mesenteric cyst, and liver and spleen cysts are considered to be abdominal cystic masses. Exhibiting laterality, being located on lower abdominal-pelvic area, developing usually in the third trimester of pregnancy and only on female fetuses are their major distinguishing characteristics from other abdominal cystic structures. Due to the presence of hydrocolpos on the posterior of bladder, urachal cysts locating at midline between bladder and umbilicus, meconium pseudocysts being the irregular cysts with thick walls which may be adjacent to liver, and those caused by renal and collecting duct systems and associated with renal parenchyma having posterior and paravertebral location, they can be distinguished from fetal ovarian cysts.[6]

During the follow-up, various complications such as the rupture of cyst, bleeding into cyste, ovarian torsion and pressure on other adjacent organs may develop. Among them, over torsion is one of the most severe complications developing mostly during prenatal period. While this is seen in 38–55% of the antenatal cases, it is

**Table 1.** Clinical characteristics and ultrasound findings of the cases.

| | Diagnosis week | Ultrasound findings | Prognosis | Delivery type |
|---|---|---|---|---|
| Case 1 | 32 weeks of gestation | 44×67×35 mm, pure cyst, unilateral (**Fig. 1a**) | The cyst grew at 35 weeks of gestation and its size reached to 65×61×56 mm. It regressed at 37 weeks of gestation (**Figs. 1b** ve **1c**). | Vaginal |
| Case 2 | 31 weeks of gestation | 21×20 mm on the left and 19×20 mm, on the right, with bilateral and simple (**Fig. 2**) thin wall, non-septated | The size of cyst did not change during pregnancy. It disappeared 2 months after the delivery. | Cesarean section |
| Case 3 | 28 weeks of gestation | 30×27 mm on the left, pure cyst, unilateral, non-septated | The size of cyst did not change during pregnancy. It disappeared 2 months after the delivery. | Cesarean section |
| Case 4 | 30 weeks of gestation | 26×25 mm on the left, pure cyst, unilateral, non-septated | It disappeared at 36 weeks of gestation. | Cesarean section |
| Case 5 | 34 weeks of gestation | 30×28 mm on the right, pure cyst, unilateral, non-septated | It persists at the same size after delivery. 20th month of follow-up. | Vaginal |
| Case 6 | 32 weeks of gestation | 49×40 mm on the right, heterogeneous, unilateral, non-septated | Its size persists at 4cm after delivery. 9th month of follow-up. | Cesarean section |
| Case 7 | 36 weeks of gestation | 30 mm on the left, unilateral, simple | Same size after delivery. 20th month of follow-up. | Cesarean |


**Fig. 1.** (**a**) Unilateral 44×67×35 mm fetal ovarian cyst (found during the examination performed at 32 weeks of gestation). (**b**) The diameter of the cyst found on the left ovarian has increased to 71×63 mm. (**c**) The cyst is seen as unilateral and with steady walls in 3D rendering mode.


**Fig. 2.** Bilateral ovarian cyst seen at 31 weeks of gestation (21×20 mm on the left and 19×20 mm on the right).

seen during neonatal period in 50–78% of the cases.[7] In the systematic review of a total of 34 studies including 954 cases, regression was observed during pregnancy or at postnatal period in 53.8% of the cases. For complex cysts, the regression is lower in cysts with sizes over 4 cm, and autoamputation or post-surgical ovarian loss in those with changes in the ultrasonographic imaging pattern is observed more frequently.[8] When postnatal surgery need is considered, higher surgical operation rates are observed in ovarian cysts with sizes over 4 cm and those having complex ultrasonographic characteristics.[8]

Torsion may cause adhesions between ovary and adjacent intestine or other pelvic organs. Doppler ultrasound examination may help for torsion suspicion. There are controversial reports about the size of cyst, the length of ovarian pedicle and torsion and hemorrhage risk.[1,9] On the other hand, torsion risk is 30 times higher in cysts with sizes over 4 cm.[8] Long-term outcomes of perinatal ovarian torsion are not known. Intracystic hemorrhage is another significant complication. It was found in the series performed on 82 cases with fetal ovarian cyst that the presence of intracystic hemorrhage findings in the ultrasound imaging is associated with poor outcomes.[10] The cysts were not complicated in our 7 cases.

The management of ovarian cysts is controversial, and there are great differences among the centers. Basically, prenatal and postnatal aspiration, neonatal surgery and simple ultrasound follow-ups to protect ovarian parenchyma are acceptable approaches. In many cases, it is observed in periodical ultrasound follow-ups that simple

cysts tend to exhibit spontaneous regression.[11] The spontaneous regression is higher in simple cysts compared to the complex cysts; however, some researchers recommend managing all cysts by conservative approach regardless of the ultrasound images of cysts. Of the cases who underwent prenatal aspiration, recurrence was observed in 37.9%, torsion in 10.8%, intracystic hemorrhage in 12.8%, and postnatal surgery need in 21.8%.[8] In the meta-analysis including a total of 380 cases with fetal ovarian cyst where 324 cases with prenatal diagnosis were followed up and 56 cases underwent prenatal aspiration, it was reported that the cyst size in the cases with highest torsion rates was between 30 and 59 mm, and that 10% of the non-aspirated cases had torsion and 49% of them had postnatal surgery need while no torsion was observed in aspirated cases and only 7% of aspirated cases had postnatal surgery need.[12] If cyst has spontaneous regression during postnatal period, surgical operation is not needed.

Surgical indications during postnatal period are controversial. Major surgical indications are complex cysts exhibiting torsion findings during postnatal period, greater cysts not regressing in the follow-ups, suspected neoplasia and symptomatic abdominal distension during neonatal period and the presence of pressure symptoms leading to intestinal obstruction. While a study recommends surgery for the treatment of symptomatic and persistent cysts with diameters over 5 cm, another study recommends neonatal surgery for the treatment of simple cysts with sizes over 2 cm and all complex cysts regardless of their sizes.[13] Depending on the experience of surgeon, the surgical method can be laparoscopic or laparotomic.

We recommend regular ultrasound follow-ups according to the ultrasonic image characteristics of fetal ovarian cysts. The ovarian cyst grew until 37 weeks of gestation in only one of our seven cases. In our four cases, fetal ovarian cysts disappeared during prenatal and postnatal follow-ups non-invasively. In other 3 cases, the cysts persisted after labor and we have been following them up without observing any size increase. Delivery type should not be affected by the presence of fetal ovarian cyst. Our 2nd, 3rd, 4th, 6th and 7th cases delivered by cesarean section due to their previous cesarean section histories.

## Conclusion

The ovarian cysts get the most frequent diagnosis in the intrauterine life. The majority of these cysts are functional cysts. Regular follow-up of the cyst size and ultrasonographic characteristics is the most frequently used method in the approach. The increase in the sizes of followed-up fetal-neonatal ovarian cyst and changing ultrasound characteristics may present the emergency surgical operations during prenatal and postnatal periods.

**Conflicts of Interest:** No conflicts declared.

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