

# Adnexal Masses In Pregnancy: A Series of 12 Patients

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## Abstract

**Objective:** The aim of this study was to evaluate the clinico-pathological features, rate of complications and pregnancy outcomes of pregnancy-associated adnexal masses.

**Methods:** A total of twelve patients were admitted to our clinic with diagnosis of adnexal mass in pregnancy during this period. Eleven of the twelve patients have been operated. Four of eleven patients (33,3 %) needed an emergency surgical intervention due to clinical signs and symptoms of acute abdomen. Three of these cases (25%) were diagnosed as adnexal torsion. Seven of the patients (58.3%) were operated under elective conditions. The most common histopathological diagnosis was dermoid cyst (27.3%) and mucinous cystadenoma in 27.3% of cases. None of the cases were malignant. None of the patients had an adverse pregnancy outcome due to emergency laparotomy.

**Results:** A retrospective study was designed to review the medical records of cases of adnexal masses in pregnancy that admitted to our tertiary center clinic between November 2006 and August 2009.

**Conclusion:** Conservative management can be preferred in pregnancy associated adnexal masses which don't cause acute abdomen and do not have the signs of malignity with clinical evaluation and imaging methods.

**Keywords:** Pregnancy, adnexal masses, management.

## Gebelikte adneksiyal kitleler: 12 vakalık seri

**Amaç:** Bu çalışmanın amacı gebelik ile ilişkili adneksiyal kitlelerin klinikopatolojik özelliklerini, komplikasyon oranlarını, gebelik sonuçlarını değerlendirmektir.

**Yöntem:** Kasım 2006-Ağustos 2009 tarihleri arasında bir tersiyer merkez olan kliniğimize başvuran, gebelikte adneksiyal kitle olgularının medikal kayıtları incelenerek retrospektif bir çalışma tasarlanmıştır.

**Bulgular:** Bu dönemde toplam 12 hasta gebelik ve adneksiyal kitle tanısı ile merkezimize kabul edilmiştir. 12 hastanın 11'i opere edilmiştir. 11 hastanın 4'ü (%33.3) akut karın belirti ve klinik bulguları ile acil cerrahi girişime ihtiyaç duymuştur. Bu vakaların 3'ü (%25) adneks torsiyonu tanısı almıştır. Hastaların 7'si (%58.3) elektif koşullarda opere edilmişlerdir. En sık karşılaştığımız histopatolojik tanı dermoid kist (%27.3) ve müsinöz kistadenomdur (%27.3). Olguların hiçbirinde maligniteye rastlanmamıştır. Hastaların hiçbirinde acil laparotomiye bağlı olumsuz gebelik sonucu görülmemiştir.

**Sonuç:** Akut karın gelişmeyen, klinik ve görüntüleme yöntemleri malignite lehine olmayan gebelikte ilişkili adneksiyal kitle olgularında gözlemsel yaklaşım tercih edilebilir.

**Anahtar Sözcükler:** Gebelik, adneksiyal kitle, yönetim.

## Introduction

Adnexal masses in pregnancy are not rare or unusual findings. They are observed more frequently after the routine use of obstetric ultra-

sonographic examination for evaluation of pregnancy. The incidence of adnexal masses in pregnancy is estimated to be between 1% and 2%1. Most of them are corpora lutea which are

physiological conditions in pregnancy and tend to resolve spontaneously at the beginning of the second trimester. Most clear cysts having less than 5 cm diameter are usually functional and can be managed expectantly as they also resolve by 16 weeks of pregnancy<sup>2</sup>. An adnexal mass persisting beyond 16 weeks of pregnancy needs to be considered for risks of torsion, tumor rupture and obstetric risks such as abortion, preterm labor and delivery, obstruction of labor, rupture of membranes<sup>3</sup>. Additionally, such a condition carries the risk of malignant disease. The incidence of ovarian malignancy is reported to be as high as 2 to 6% among all adnexal masses diagnosed during pregnancy<sup>4</sup>. The tumor antigen CA-125 has a limited value due to its elevated and fluctuating level in normal pregnancy and the other markers such as  $\beta$ -hCG and alpha-fetoprotein are routinely used for fetal surveillance rather than tumor detection during pregnancy<sup>5</sup>. There is still a controversy regarding the optimal management option, whether it should be in the form of expectant management or surgical intervention, for an adnexal mass diagnosed during pregnancy due to possible fetal risks and surgical morbidity on one hand, and the risk of need for emergency surgery and delay in the diagnosis of malignancy when expectant management is chosen, on the other hand<sup>3</sup>. We conducted a retrospective review of the patients with adnexal masses some of whom operated during pregnancy and evaluated the pathological features, rate of complications and outcome of the pregnancies.

## Methods

A retrospective study was designed to review the medical records of cases of adnexal masses in pregnancy that admitted to our tertiary center clinic between November 2006 and August 2009. There were totally 3306 deliveries during the period of the study. Age, gravidity,

parity were noted. Gestational weeks at the time of diagnosis, gestational age at the time of delivery and at the time of surgery (if surgery is performed) were collected according to date of the first day of last menstrual period and if those were missing, depending on the ultrasonographic fetal biometry at the first trimester. Three dimensional diameters of the masses in millimeters were measured sonographically and the mean sizes were calculated by division of sum of these three diameters into three. Cases were divided into two according to the indication of the surgery, whether they are emergent or elective. The ultrasonographic findings of masses such as septations and papillary projections were noted. Complaints of the patients for hospital admission (if they existed), serum CA-125,  $\beta$ -hCG and alpha-fetoprotein levels were collected. The surgical aspects, type of delivery (C-section and vaginal delivery), postoperative complications such as PPRM and preterm labor and the treatment modalities for postoperative complications were established. Birth weight and gender of babies, apgar scores at the first and the fifth minutes, perinatal and neonatal complications were defined. Finally, pathological diagnosis of surgical specimen and frozen section specimen (if they were needed to be sent to the pathology department intraoperatively) were noted from the pathological examination reports. Values were expressed as mean $\pm$ SD (standard deviation) unless stated otherwise.

## Results

A total of twelve patients were admitted to our tertiary center clinic with diagnosis of adnexal mass in pregnancy between November 2006 and August 2009. The mean maternal age

was  $24.1 \pm 3.8$  years (range 19-31 years). The mean gravidity was  $1.9 \pm 0.99$  (range 1-4) and mean parity was  $0.67 \pm 0.78$  (range 0-2). The median gestational weeks at the time of diagnosis of the adnexal mass and at the time of the surgery was 8 weeks and 3 days (range 5 weeks 5 days to 38 weeks 2 days) and 20 weeks (range 7 weeks to 38 weeks 6 days) respectively. The mean time of delivery was 37 weeks (range 32 weeks to 38 weeks 6 days). The mean birth weight was  $3165 \pm 644$  grams (range 2260 to 4110 grams). The mean first minute Apgar score was  $7.5 \pm 1.4$  (range 5 to 9) and the fifth minute was  $8.7 \pm 1.0$  (range 7 to 10) (Table 1). The mean size of the masses were  $87.83 \pm 48.18$  millimeters (range 41 mm to 210 mm). Serum CA-125 levels were assessed in nine of twelve patients and the mean level was  $41.78 \pm 37.0$  IU/ml (reference range 0 – 35 IU/ml) (range 11 to 130 IU/ml). As a sum, eleven of the twelve patients have been operated. Four of eleven patients (33.3%) needed an emergency surgical intervention due to clinical signs and symptoms of acute abdomen. Seven of the patients (58.3%) were operated under elective conditions. In emergent cases, one was diagnosed at 31. week with the pre-

senting symptom of abdominal pain. There was a 132 mm hypoechoic cystic mass in the left adnexa sonographically. She had two previous cesarean sections. This patient admitted to the emergency department with severe abdominal pain and uterine contractions at 35. week. Cesarean and left oophorectomy was performed concurrently. Frozen section and final pathology report revealed a mucinous cyst adenoma. Three of these cases were diagnosed with the clinical symptoms and signs of adnexal torsion, two of which were the torsion of an ovarian mass (one was simple cyst and the second was hemorrhagic cyst) and one was isolated tubal torsion. Two of these patients underwent surgery at the first trimester and the one (isolated tubal torsion) in the third trimester. Two of the emergent cases were operated just after the diagnosis of the adnexal lesion because the clinical presentation was adnexal torsion. One of them was 30 week and 1 day, there was a 73 mm multiloculated hypoechoic cystic mass with incomplete septations in the right adnexal region diagnosed with sonography. At laparotomy right ovary was appeared normal while the right fallopian tube was twisted two times around itself. The intraoperative findings at the emergent laparotomy were consistent with the isolated right tubal torsion. The fallopian tube was not seemed necrotic, so detorsion was done. 2 weeks later at 32. gestational week this patient admitted to the emergency department with regular uterine contractions, 3 cm dilatation and 50% effacement. With the indication of breech presentation, cesarean section was performed and 2700 gr baby was born. The other case was diagnosed and operated at the nine week two days. The presenting symptom of this patient was abdominal pain. A 58 mm bilobulated hypoechoic cystic

**Table 1.** Information on maternal and neonatal.

Maternal age (year)	$24.1 \pm 3.8$ (19-31)
Nulliparous n (%)	6(%50)
Parity=1 n (%)	4(%33)
Parity=2 n (%)	2(%17)
gestational age (week)*	37(32-39)
Full-term delivery n (%) <sup>†</sup>	8(%80)
Preterm delivery n (%) <sup>†</sup>	2(%20)
Birth weight (g)*	$3165 \pm 644$ (2260-4110)
Apgar score	
1. dk*	$7.5 \pm 1.4$ (5-9)
5. dk*	$8.7 \pm 1.0$ (7-10)

<sup>†</sup>\*Ortalama±standart sapma (minimum-maksimum) olarak verilmiştir.

<sup>†</sup>2 hasta takipten kayboldu.

mass was diagnosed by sonography. CA-125 value of this patient was not studied due to urgent conditions of the operation. Intraoperative diagnosis was ovarian torsion. The final pathology report of this patient revealed necrotic hemorrhagic corpus luteum. This patient was lost to follow up after the operation. The other emergent case was diagnosed at 6 week and 5 day. There was a multiseptated anechoic lesion in the right adnexal region. At 10 week and 4 day this patient was admitted to the emergency department with the clinical signs and symptoms of acute abdomen. A laparotomy was made with the diagnosis of adnexal torsion. Intraoperatively right ovary was twisted around the infundibulopelvic ligament. The ovary was appeared edematous and hemorrhagic but not necrotic. So detorsion of the ovary and cystectomy was done. This patient had undergone elective cesarean at 38 week and 6 day and 2630 gr baby was born. There were 7 cases operated under elective conditions. Six of these seven patients were diagnosed at the first trimester by routine obstetric ultrasound examination. One of them was diagnosed at the third trimester. Three patients were operated in the first trimester, in one of the patients, surgery was delayed to second trimester. The remaining three patients including the patient diagnosed at the third trimester were operated during the cesarean section. In one of the patients, bilateral multiple simple ovarian cysts among which the biggest having the mean size 72 mm were diagnosed at the eleventh week. The appearance of ovaries was just like in the ovarian hyperstimulation syndrome, but there was no ascites and the conception was spontaneous. These cysts have resolved during the course of pregnancy spontaneously, no surgery was intended for this

patient. During the cesarean section, no adnexal mass was found. Two of the patients were lost to follow-up after the operation for adnexal mass. Eight of the remaining ten patients were delivered by cesarean section (80%) and two patients (20%) were delivered vaginally. Two of the patients operated under emergent conditions had preterm labor. One is the patient with isolated tubal torsion operated at 30 week and one day. At 32. week she had preterm labor. Due to breech presentation she had undergone cesarean section. The other one is the emergent patient with mucinous cyst adenoma who is operated at 35. week and had a cesarean at the same time. In three cases (27.3% of all cases), pathological diagnosis was mucinous cystadenoma. In the other three (27.3 % of all cases), the diagnosis was dermoid cyst (mature cystic teratoma). There was three adnexal torsion cases, one was torsion of right fallopian tube, two were torsion of benign simple cyst and hemorrhagic corpus luteum. In two cases, the pathologic diagnosis was paraovarian cyst (Table 2).

## Discussion

In our series, 3 of 12 patients (25 %) required an urgent laparotomy with indication of adnexal torsion. One of them was isolated tubal torsion. The other two adnexal torsion cases had the diagnosis of corpus luteum and benign-functional cyst after the pathological examination. The rate of torsion reveals a great variability among the series, from 1 % to 22 %6. Adnexal torsion usually presents in the first trimester, as the uterus is moving out of the pelvis, although some cases have been described in the second and, rarely, in the third trimester. The most common pathological diag-

**Table 2.** Clinical characteristics of patients.

Not emergency/ elective- operation time	Week of diagnosis, complaints, clinical signs	Ultrasound findings	operation week	indication for surgery	Applied Surgical Results	Frozen	Final pathology	Week of birth, type, indication
1 Emergency childbirth third trimester	31 weeks, groin pain, acute abdomen, 23y, G3P2Y2	132 mm hypoechoic left adnekste	35 weeks	Severe pelvic and abdominal pain, preterm labor, previous	oophorectomy + appendectomy	Mucinous tm	Mucinous cystadenoma	35 weeks, repeated painful
2 At diagnosis in emergency (third trimester)	30 weeks 1 day, severe abdominal pain, acute abdominal findings 20y, G1P0	Right adnekste 73 mm multiloculated hypoechoic cystic mass with incomplete septation	30 weeks 1 day	Adnexa torsion	detorsion + salpingostomy, isolated from the right tubetorsion,	—	—	32 weeks, C/S in pretermaction, breecharrival
3 Emergency-the time of diagnosis (First trimester)	9 weeks 2 days, abdominal pain, acute abdomen, 30Y,G4P2A1Y2	The right ovary 58 mm bilobule hypoechoic cystic mass	9 weeks 2 day	Ovarian torsion	Right ovary detorsion, Right ovarian cyst excision, ovarian torsion, 6 cm hemorrhagic cystic mass	—	hemorrhagic corpus luteum	Lost to follow-up, repeat C/S
4 Emergency- lovers after a month (First trimester)	6 weeks 5 days, acute abdomen, 22y, G1P0	70 mm multiseptali, cystic mass	10 weeks 4 day	Ovarian torsion	detorsion, cystectomy, ovarian edema and hemorrhagic, not necrotic	benign fibrous wall	Benign cyst wall	38 weeks 6 days, elective C/S
5 Elective- First trimester (diagnosis a week after)	8 weeks 3 days, acute abdomen 22y, G2P1Y1	210 mm, hypoechoic cystic mass, mucinous cyst adenoma?	9 weeks 5 day	Abdominal pain, suspicious for malignancy, large mass, CA125: 130	Right oophorectomy, appendectomy, provide the ksfoider ranging from 25x15cm mass (normal ovarian tissue observed)	mucinous tumor, benign malign separation paraffin block	Mucinous cyst adenoma	37 weeks 3 days, painful repeat C/S
6 Elective- First trimester (diagnosis at the time)	7 weeks acute abdomen 26y, G1P0,	62 mm, miksekoik	7 weeks	severe abdominal pain, torsion The risk of torsion could not be ruled out	myomectomy	—	Leiomyoma uteri	Lost to follow-up, on the outer center
7 Elective- second trimester (diagnosis after 6 weeks)	7 weeks, 2 days, No complaints, control, 26y, G2P1Y1,	76 mm, hypoechoic, miksekoik, dermoid?	13 weeks 1 day	Mass 76 mm Growth of 85 mm, forward groin pain The risk of torsion	Cystectomy	mature cystic teratoma	mature cystic teratoma	Term, normal birth
8 Elective- second trimester (diagnosis after 15 weeks)	5 weeks 5 days, No complaints, control, 29y, G2P1Y1	64 mm, miksekoik, dermoid?	20 weeks	Mass 64 mm Growth of 88 mm, The risk of torsion, a large- mass	Left USO (Normal ovarian tissue observed)	mature cystic teratoma	mature cystic teratoma	Term, normal birth
9 Elective-birth	7 weeks 5 days, No complaints, control, 24y, G2A1Y0,	41 mm hypoechoic, content of heavy oil- compatible with papillary structure, dermoid?	38 weeks 1 day	During caesarean cystectomy	caesarean + cystectomy	—	Dermoid cyst	38 weeks 1 day, elective C / S
10 Elective-birth	38 hft 2 gün, diş merkezden sevklı, ağı, 19y, G1P0	138 mm, anekoik kist	38 weeks 3 day	During caesarean cystectomy	Caesarean + cystectomy, left 20x15 adnekstem para ovarian cystic lesion observed)	—	benign cystic formation (para ovarian cyst)	38 weeks 3 days, elective C/S, painful, large ad- nexal mass
11 Elective-birth	First trimester (36 weeks 1 day, while guided), complaints No, control, 31y, G3P1A1Y1	58 mm, septate, multiloküle	38 weeks 6 day	During caesarean oophorectomy	Caesarean + oophorectomy + appendectomy (Normal ovarian tissue was observed)	Benign müsinöz kist	mucinous cystadenoma	38 weeks 6 days, repeat C/S

\*Abbreviations: **C/S:** Caesarean, **USO:** Unilateral salpingo-oophorectomy

noses were dermoid cyst (mature cystic teratoma) and mucinous cystadenoma. The other pathologically reported cases were paraovarian cyst, benign-functional ovarian cyst and hemorrhagic corpus luteum. In literature dermoid cysts are the most common types of adnexal masses in pregnancy and tend to result in torsion more commonly. They comprise approximately 37% of all adnexal masses diagnosed during pregnancy. Cystadenomas are seen as 24 %, persistent corpus luteum cysts as 20 %, paraovarian cysts as 5 %, endometriomas as 5 %, leiomyomas as 5 %. Malignant tumors are found in upto 5,9% of the cases.<sup>7</sup> In our series, we found no evidence of malignant disease. Also, no sonographic criteria for risk of ovarian malignities such as solid mass, nodular appearance, thick septations were observed in any of the cases. The incidence of malignancy for adnexal masses in pregnancy was estimated to be as high as 6.8%<sup>8</sup>. In our case series, we did not encounter any malignant cases. The management of adnexal masses during pregnancy is still a controversial issue. Surgery and observation of the mass are the two management options, but there is not a standard established protocol for those patients. Surgery is the preferred way of treatment when malignancy is suspected or there is the risk of torsion, cyst

rupture or labor obstruction. Sometimes, observation of the lesion may be the optimum way of management to avoid maternal morbidity and adverse fetal-neonatal outcomes. In our series, we performed surgery for 11 of the 12 patients. Four of them were performed under emergency circumstances. Three of them presented with adnexal torsion and one of them presented with signs of the acute abdomen and had a mass of 132 mm diameter. There were no significant difference between emergent and elective surgery groups according to maternal and fetal-neonatal outcomes. Results of similar series are consistent with ours when the perinatal outcomes of emergent and elective surgery were compared. Also, no postoperative complications and maternal morbidity is observed in our series.

## Conclusion

Majority of adnexal masses that observed in the first trimester are corpus luteum cysts and they are expected to resolve spontaneously at the beginning of the second trimester. Adnexal masses persisting beyond the second trimester need to attract attention especially due to their risks of torsion and rupture and potential obstetrical risks they carry. Also, there is a risk of missing the underlying malignancies. Although, no maternal or fetal-neonatal adverse outcome is reported in this series, surgical point of view must be limited in patients having the risks previously mentioned. Conservative management can be preferred in pregnancy associated adnexal masses which don't cause acute abdomen and do not have the signs of malignity with clinical evaluation and imaging methods. Further studies and larger series are needed to have more clear guidelines on management of adnexal masses in pregnancy which is still a challenge and issue of controversy.

**Table 3.** Pathological features of adnexal masses (n=11).

	Olgu sayıları	
	n	%
Pathological diagnosis		
Mature cystic teratoma	3	27.3
Mucinous cystadenoma	3	27.3
Paraovarian cyst	1	9.1
Myoma uteri	1	9.1
Simple cyst (basic)	1	9.1
Hemorrhagic corpus luteum	1	9.1
Isolated tubal torsion	1	9.1

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