

## Original Article

### Adnexal Masses and Pregnancy: A 10-Year Experience

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#### ABSTRACT

**Background and Objectives:** The diagnosis of pregnancy associated adnexal masses is rising due to routine utilization of sonography in prenatal care. The purpose of this study was to describe pregnancy associated adnexal masses over a period of 10 years.

**Patients and Methods:** A retrospective study was reviewed hospital records of all pregnant women with adnexal mass that underwent surgical resection in Mirza Kuchak Khan Hospital in Tehran from January 1996 to March 2006. The collected data included maternal age, parity, gestational age at diagnosis, surgery and delivery, presenting symptoms and treatment. The pregnancy outcome complications and histological findings were reviewed.

**Results:** Totally 29220 deliveries were performed in our institution; adnexal masses were detected in 0.01% of pregnancies. Antepartum surgery was performed in 4 (10.3%) patients. The mean gestational age at delivery in patients undergoing surgery during pregnancy was 36 weeks (ranged 36-37 weeks) while in patients with cystectomy during cesarean delivery was 38 weeks (range: 33-40) ( $P=0.04$ ). There were no statistically significant differences in birth weight between the patients undergoing surgery during pregnancy and those with surgery at cesarean delivery ( $P=0.176$ ). The mean cyst diameter was 11 cm (range 4-16 cm) for patients operated during pregnancy while it was 4 cm (2.5-12 cm) for those undergoing surgery during cesarean delivery ( $P=0.006$ ). The most common diagnosis was benign serous cyst (23.1%) followed by benign Dermoid cyst (20.5%).

**Conclusion:** Patients undergoing laparotomy for adnexal mass during pregnancy had higher risk of preterm labor but there were no difference in birth weight.

**Key words:** Adnexa Uteri, Tumor, Pregnancy, Gestational Age, Birth Weight

#### Introduction

The finding of adnexal masses during pregnancy has increased because of routine use of ultrasonography. The use of ultrasonography

has resulted in the detection of asymptomatic and clinically unapparent lesions (1). Approximately 1-4% of pregnant women are diagnosed with an adnexal mass (2). The majority of these masses are corpus luteum or other functional cysts that usually

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resolve by 16 weeks of gestation (3).

The management of asymptomatic adnexal masses during pregnancy is controversial. Surgery is usually performed to rule out malignancy and prevent complications such as torsion, cyst rupture, and obstruction of labor. The complications of surgery during pregnancy include spontaneous abortion, rupture of membranes, and premature delivery. High-resolution ultrasonography provides increased sensitivity to distinguish benign and malignant lesions (4).

The management of adnexal masses associated with pregnancy is variable. The two most common options are operative extirpation of the mass or expectant management (5). Cyst size, gestational age and sonographic appearance all need to be considered when evaluating adnexal masses and designing a treatment plan (6).

The purpose of this article was to characterize the adnexal masses associated with pregnancy and to report fetal outcome.

## Material and Methods

We reviewed the hospital charts of all pregnant patients who underwent surgery for adnexal mass at Mirza Kuchak Khan Hospital in Tehran from January 1996 to December 2006. This retrospective study was approved by the hospital Ethics Committee.

The medical records were reviewed for patient age, parity, gestational age at diagnosis, gestational age at treatment, gestational age at delivery, birth weight, histological diagnosis of the adnexal masses, the size of the adnexal masses and presenting symptoms.

Patients with single pregnancy and a simple cyst, anechoic cyst with a mean diameter of  $\geq 2.5$  mm or those with a complex adnexal mass of any size were included in the study. Pregnant patients with an adnexal mass resolved spontaneously were excluded. Adnexal masses found simultaneously with ectopic pregnancies were also excluded. Patients with vaginal bleeding and preterm delivery due to placenta previa and placental abruption also patients with medical diseases were excluded.

Results were reported as mean  $\pm$  standard deviation (SD) or median. Continuous variables were compared using nonparametric Mann-Whitney U test for non-normally distributed variable, and categorical

variable were compared using Fisher's exact test. For statistical analysis, the statistical software SPSS version 13.0 Windows (SPSS Inc., Chicago, IL) was used. All P values was 2 tailed, with statistical significant defined by  $P < 0.05$ .

## Results

Totally, 29220 deliveries were performed at our unit. Thirty-nine (0.01%) of these patients were found to have an adnexal mass.

Mean maternal age and parity were 29 yr (range 22-42 yr) and 2 (range 1-6), respectively. The mean size of the adnexal mass was 5 cm (range 2.5-16 cm). Mean gestational age at surgery was 35 weeks (range 10-40). Mean gestational age at delivery was 37 (range 33-40).

The mass was diagnosed on prenatal ultrasound examination in 13 women (33.3%) and at the time of cesarean delivery in 26 (66.7%) patients. The mean diameter of cyst in patients with diagnosis during pregnancy and cesarean delivery was 8cm (range 2.5-16cm) and 4cm (range 2.5-10cm), respectively ( $P=0.05$ ).

Thirty-four patients (87.2%) were asymptomatic and the remaining 5 women (12.8%) presented with pain. Four (10.3%) of these five symptomatic patients, underwent surgery secondary to ovarian torsion. The mean gestational age at time of surgery was 13.2 weeks of gestation. The histological diagnosis was dermoid cyst in two patients and benign serous cyst adenoma in the other women. Two of them had uncomplicated spontaneous vaginal deliveries at term, subsequently. The other women had preterm delivery at 32 and 34 weeks of gestation. The fifth patients, with abdominal pain being followed for adnexal mass and underwent a repeat cesarean delivery and unilateral cystectomy.

The mean gestational age at delivery in patients undergoing surgery during pregnancy was 36 weeks (range 36-37 weeks) while in patients with cystectomy during caesarean section was 37 weeks (range 33-40 weeks) ( $P=0.04$ ) There was no statistically significant difference in birth weight between the patients surgery during pregnancy and those with operated through caesarian delivery ( $P=0.176$ ).

The pathologic results are shown in table 1. The most common diagnosis was benign serous cyst (23.1%) followed by benign dermoid cyst (20.5%). Adnexal masses with clinical presenting symptoms were dermoid cyst, benign serous cyst and benign mucinous cyst.

**Table 1:** The results of histological examination in 39 patients with adnexal mass

Pathology Finding	n (%)	Cyst size (cm) median $\pm$ SD	Antepartum Diagnosis n (%)	Presenting Symptom n (%)	Birth weight (gr) median $\pm$ SD
Paratubal cyst	5(12.8)	3.4 $\pm$ 0.5	1(20)	–	3300 $\pm$ 1108
Dermoid cyst	8(20.5)	5.6 $\pm$ 2.6	3(37.5)	1(12.5)	3100 $\pm$ 362
Benign serous cystadenoma	9(23.1)	8.8 $\pm$ 4.5	6(66.7)	3(33.3)	3000 $\pm$ 452
Simple cyst	7(17.1)	4 $\pm$ 1.5	0(0)	–	3100 $\pm$ 422
Benign mucinous cystadenoma	3(7.7)	6.9 $\pm$ 3.4	2(66.7)	1(33.3)	3000 $\pm$ 404
Endometrioid cyst	6(15.4)	3.1 $\pm$ 0.4	1(16.7)	–	3150 $\pm$ 178
Brenner cyst	1(2.6)	3 $\pm$ 0	0(0)	–	3000 $\pm$ 0

### Discussion

An accurate estimate of the incidence of an adnexal mass in pregnancy is not available because of variations in definitions and method of ascertainment. However, the finding of an adnexal mass during pregnancy has been reported to range from 1 in 25 to 1 in 8000 pregnancies (1). In our study, the incidence of adnexal masses was 1 in 795 deliveries. Pathologically the most common tumor was benign serous cyst (23.5%) followed by dermoid cyst (20.5%). Although the incidence of dermoid cysts in our study was lower than that of Sherard *et al.* who reported it to be 50% (1), but the incidence of cyst adenoma associated with adnexal mass in pregnancy was increased over the previously reported. Functional cysts occurred in 17.1% of our cases compared with previous ranges of 22% to 54% (6).

There have been significant recent improvements in ultrasound technology, resulting in better characterization of adnexal masses. These include the development of transvaginal transducers, as well as improved image resolution technology (7). In addition, the use of color Doppler imaging and, where required magnetic resonance imaging (MRI), have been shown to significantly improve the ability to distinguish benign from malignant masses (8).

Thirteen cases (33.3%) of pregnancy associated adnexal masses had been detected through sonography. The mean size of masses in patients with diagnosis during pregnancy was larger than diagnosis at cesarean delivery (the mean size 8.5 cm. vs. 4.1 cm, respectively) ( $P=0.05$ ).

The complications of adnexal masses in pregnancy include malignancy, torsion or hemorrhage. The

incidence of these complications depends on the tumor size, or performing preventive laparotomy in tumors with higher risks of torsion (3, 9).

In our study 5 out of 13 (38%) patients diagnosed during pregnancy were symptomatic, 4 (10.3%) of them required surgery during pregnancy that two patients of them had preterm delivery.

Numerous studies reported higher incidence of spontaneous abortion, premature delivery, and low birth weight as consequences of surgery during pregnancy. Hess *et al.* reported 15 out of 54 adnexal masses (28%) required emergent surgery during pregnancy that of them 40% complicated with abortion and premature delivery (10).

In the present study no abortion was seen following surgery during pregnancy; however, the average gestational age at delivery for those patients underwent surgery at caesarian was lower than those performing surgery during pregnancy ( $P=0.006$ ) but the birth weight had no difference.

Ovarian torsion is a potential complication of observed large adnexal masses during pregnancy (1, 8, 11). Four patients (10.3%) required emergent surgery due to torsion. in our study; this is higher than reported in similar studies (4).

The treatment of adnexal masses associated with pregnancy is controversial. Usually, ovary enlargement with a diameter smaller than 6 cm is caused by the formation of corpus luteum. Wells and Thornton have presented a conservative management based on the sonographical features; they propose that all cysts suspicious of rupture, torsion, or obstructing labor, and all cysts larger than 10 cm undergo resection during pregnancy. The cysts smaller than 5 cm, usually are resolved spontaneously and should not be

manipulated. The management of cysts measuring 5 to 10 cm is controversial (12). Platek *et al.* observed a group of women with cysts ranging from 5 to 10 cm. Fifty percent of the cases came to require laparotomy as a result of torsion, infarction, or rupture (13).

Surgical management of adnexal masses in pregnancy was approved through the traditional laparotomy. However, laparoscopy is widely accepted as the most efficient way to manage benign adnexal mass in non-pregnant patients. Currently, laparoscopy is often used during the first trimester of pregnancy (14, 15).

### Conclusion

In this study, adnexal masses with larger sizes had a higher risk for developing symptoms, diagnosis and requiring surgery during pregnancy. Laparotomy during pregnancy raises the chance of preterm delivery, but does not raise the low birth weight. Most cases of persistent masses in pregnancy are of the histological type that do not regress spontaneously and require surgery.

The authors declare that they have no conflicts of interest.

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