

## Evaluation of Adnexal Masses Associated with Pregnancy in an Outpatient Clinic in Aden

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### Abstract

**Introduction:** The widespread use of ultrasound in obstetrics has led to an increase in the diagnosis of asymptomatic adnexal masses in pregnancy. Ultrasound is an accurate and safe method for diagnosing the etiology of an adnexal mass and distinguishing benign from malignant pathology. The aim of this study was to determine the frequency of adnexal pathology detected in the first trimester in women presenting for early pregnancy care, follow-up of these masses in the second trimester in order to observe their natural history; and assess their obstetric outcomes.

**Methods:** This is a prospective observational study of women attending for early pregnancy care between 1<sup>st</sup> July 2017 and 30<sup>th</sup> June 2018, in a private outpatient clinic in Aden. All women up to 14 weeks' gestation had both ovaries visualized by transvaginal or transabdominal sonography. All the ultrasonic examinations were done and followed up by the same observer with standard sonographic definitions. They were followed with ultrasound scans every 4–6 weeks during the second trimester until either resolution of the ovarian cyst occurred, intervention was required or the pregnancy was aborted.

**Result:** During the 1-year study period, dating scans were performed in 505 women, 12% of them were incidentally found to have adnexal masses. The frequency of adnexal mass in the study group was 12% in the first trimester, and spontaneous regression occurred in 88.5% of the cases, leaving only 3.3% beyond the second trimester. Torsion occurred in 4.9% and rupture in 1.6%. Operative interventions were required in 8.2% of women (four of them because of pain and one because of suspicious mass which appeared to be big mature cystic teratoma. Nine women (14.8%) had spontaneous abortion in the first trimester.

**Conclusion:** The current findings support conservative management for asymptomatic small simple cysts diagnosed during pregnancy. The need for subsequent follow-up scans in this group during the antenatal period is minimal due to their benign nature and minimal risk of complications or adverse outcomes.

**Key words:** Adnexa, Mass, Pregnancy, Ultrasound, Diagnosis.

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## تقييم تكتل ملحقات الرحم خلال فترة الحمل في إحدى العيادات في عدن

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## ملخص الدراسة

**المقدمة:** أدى استخدام الموجات فوق الصوتية على نطاق واسع في طب التوليد إلى زيادة في تشخيص تكتل ملحقات الرحم عديمة الأعراض في فترة الحمل. الموجات فوق الصوتية هي طريقة دقيقة وأمنة لتشخيص مسببات كتلة ملحقات الرحم والتمييز بين الحميدة والخبيثة منها. هدفت الدراسة تقييم مدى انتشار تكتل ملحقات الرحم عديمة الأعراض في الثلث الأول من الحمل في النساء اللاتي يحضرن لرعاية الحمل المبكر، ومتابعة هذه الكتل في الثلث الثاني من الحمل من أجل مراقبة تاريخهم الطبيعي؛ وتقييم المضاعفات التوليدية المتعلقة بهم.

**المنهجية:** أجريت دراسة استطلاعية رصدية للنساء اللاتي يحضرن لمتابعة الحمل المبكر بين 1 يوليو 2017 و30 يونيو 2018 في عيادة خاصة في عدن. تم متابعة الحمل مع المبيضين لجميع النساء اللواتي يصل حملهن إلى 14 أسبوعاً بواسطة التصوير بجهاز الموجات فوق الصوتية عبر المهبل أو عبر البطن. جميع الفحوصات بالموجات فوق الصوتية تم إجراؤها ومتابعتها من قبل نفس المتابع حسب تعريفات قياسية. تم متابعة الفحص بالموجات فوق الصوتية كل 4-6 أسابيع خلال الثلث الثاني من الحمل حتى حدوث انحلال للكيس، التدخل الجراحي أو إجهاض الحمل.

**النتائج:** خلال فترة الدراسة التي استمرت عامًا واحدًا، أجريت فحوصات لـ 505 امرأة، ووجد بالمصادفة أن 12% منهن لديهن كتلة في ملحقات الرحم في الأشهر الثلاثة الأولى، وحدث الانحدار التلقائي في 88.5% من السيدات، وبقيت فقط في 3.3% إلى الثلث الثاني، حدث التواء في 4.9% وحدث تمزق في 1.6%. التدخلات الجراحية حدثت في 5 سيدات (8.2%)، أربعة منها بسبب الأم حادة وواحدة بسبب كتلة مشبوهة والتي تبين أنها كيس جلداني كبير. تعرضت تسع نساء (14.8%) للإجهاض التلقائي في الثلث الأول من الحمل.

**الاستنتاج:** نتائج الدراسة تدعم ضرورة متابعة الكتل البسيطة الصغيرة (بدون أعراض) التي تم تشخيصها أثناء الحمل. تعد الحاجة إلى إجراء فحوصات متابعة لاحقة في هذه المجموعة خلال فترة ما قبل الولادة ضئيلة للغاية، نظرًا لطبيعتها الحميدة والحد الأدنى من خطر حدوث مضاعفات أو نتائج سلبية.

**كلمات مفتاحية:** الحمل، تكتل ملحقات الرحم، جهاز الموجات فوق الصوتية، التشخيص.

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## Introduction

The widespread use of ultrasound in obstetrics has led to an increase in the diagnosis of asymptomatic adnexal masses in pregnancy. Ultrasound is an accurate and safe method for diagnosing the etiology of an adnexal mass and distinguishing benign from malignant pathology [1].

Adnexal masses can be found in women of any age, and pregnancy is not only no exception, but also a period associated with some particular adnexal formations [2]. Familiarity with the natural history and sonographic features of common adnexal lesions such as simple cysts, mature cystic teratomas, endometriotic cysts, and ovarian conditions specific to pregnancy, such as ovarian hyperstimulation, hyperreactio luteinalis and luteomas, are important when evaluating a pregnant woman with an adnexal mass [3]. Antenatally, ultrasound is considered to be the best first-line imaging to evaluate adnexal masses [4]. Ovarian mass characterization into benign, malignant or borderline can be challenging in pregnancy. This is mainly due to the effect of high levels of gestational hormones which can cause decidualisation of the cystic or solid parts of the ovaries. Benign masses can mimic malignant masses due to this pregnancy related phenomena [5].

The reported incidence of adnexal masses in pregnancy varies, depending on the criteria used to define the mass. Goh *et al* [6], found that 1% of all pregnancies were diagnosed with an adnexal mass.

Mukhopadhyay *et al* suggested that adnexal masses are diagnosed in 5% of all pregnancies [7]. Simple and functional cysts are very common, and they usually resolve after the first trimester [8].

The aim of this study was to determine the frequency of adnexal pathology detected in the first trimester in women presenting for early pregnancy care, follow-up these masses in the second trimester in order to observe their natural history, and assess their obstetric outcomes.

## Methods

This was a prospective observational study of women attending for early pregnancy care between 1<sup>st</sup> July 2017 and 30<sup>th</sup> June 2018, in a private outpatient clinic in Aden. Information of the patients regarding their age, parity, clinical presentation, gestational age at diagnosis and surgery, ultrasonographic features and mean ovarian cyst diameter, surgical treatment, maternal and fetal complications and the histopathology of the tumors (if excised) were noted.

All women up to 14 weeks' gestation had both ovaries visualized by transvaginal or transabdominal sonography, using the Samsung Medison SonoAce R3 ultrasound machine (SAMSUNG MEDISON CO., LTD) with a convex abdominal probe and vaginal probe, including color and power Doppler imaging. All the ultrasonic examinations done and followed up by the same observer with standard sonographic definitions. The definition of adnexal lesion is the presence of a simple

anechoic ovarian cyst with a minimum diameter  $\geq 25$  mm or a complex ovarian cyst of any size [9]. They were followed with ultrasound scans every 4–6 weeks during the second trimester until either resolution of the ovarian cyst occurred, intervention was required or the pregnancy was aborted. Resolution of the cyst was defined as the diameter of the ovarian cyst decreasing to  $< 22.5$  mm (i.e. decreasing by at least 10%) [9]. Intervention was required if the ovarian cyst was causing symptoms of pain as a result of acute torsion, or if the ovarian cyst was thought to be suspicious in nature according to previously reported morphological criteria [10]. If the ovarian cyst was noted at the time of early pregnancy loss, women were rescanned 6 weeks later. All women gave their informed oral consent to participate in the study.

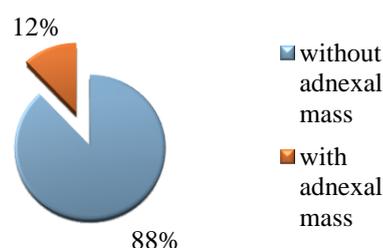
The criteria used for the classification of ovarian cyst in the study were those formulated by Graham [1], who enlists the differential diagnosis of adnexal masses in pregnancy. Simple and anechoic cysts that resolved were thought to be corpora lutea, while those with a spider-web like internal matrix were classed as hemorrhagic corpora lutea; those with ground-glass contents were classified as endometriomas; those with low-level echoes were classified as mucinous cystadenomas; those with mixed echogenicity were classified as dermoid cysts or mature cystic teratomas; those with both solid and cystic components with papillary projections without color Doppler flow were classified as borderline tumors. Histological confirmation of the nature of an ovarian cyst was

obtained in five women who underwent surgical intervention (ovarian cystectomy).

All collected data were analyzed with the Statistical Package for the Social Sciences (Windows version 20.0; SPSS Inc, Chicago [IL], US).

## Results

During the 1-year study period, dating scans were performed in 505 women; of them 61 (12%) were incidentally found to have adnexal masses as illustrated in Figure 1.



**Figure 1:** The Frequency of Adnexal Masses

Majority were asymptomatic (93.4%) and most of the cysts underwent spontaneous resolution (88.5%). In 3.3%, the cysts persisted beyond the second trimester and 8.2% required acute interventions, as shown in Table 1.

The size of the adnexal masses, and other sonographic and related features are presented in Table 2. Simple cyst  $\leq 5$  cm was found in the majority (86.9%), with only 3.3% with simple cyst  $> 5$  cm. Multicystic masses and complex masses found only in 9.8%.

**Table 1:** Clinical Presentation of Adnexal Masses in Pregnancy (n=61)

Clinical presentation and outcome	No.	%
Asymptomatic	57	93.4
Spontaneous resolution	54	88.5
Persistence	2	3.3
Intervention	1	1.6
Symptomatic	4	6.6
Spontaneous resolution	0	0.0
Persistence	0	0.0
Intervention	4	6.6

**Table 2:** Categorization of Adnexal Masses in Pregnancy According to Sonographic Features in the Initial Scan (n=61)

Category of adnexal masses	No.	%
Simple cyst $\leq$ 5 cm	53	86.9
Simple cyst $>$ 5 cm	2	3.3
Multicystic masses	1	1.6
Complex masses	5	8.2

Table 3 presents the frequency of obstetric complications associated with adnexal masses in pregnancy. In total, 4.9% of the ovarian cysts underwent presumed ovarian torsion and one case got rupture of the cyst. Nine women (14.8) had spontaneous abortion in the first trimester.

**Table 3:** Outcomes of Adnexal Masses in Pregnancy (n=61)

Outcomes	No.	%
<b>No complications</b>	48	78.7
<b>Complication</b>		
Abortion	9	14.8
Torsion	3	4.9
Rupture	1	1.6

Table 4 shows the details of women requiring operative intervention. Three women required admission in the first trimester ( $<$ 12 weeks' gestation) as a result of severe lower abdominal pain, they were operated and torsion of the cyst was found. One case was fibroma, one was functional cyst, and one case of rupture corpus luteum. Two cases operated in the second trimester, one because of suspicious mass, and histology confirmed a mature cystic teratoma, the other case found to be serous cystadenom presented with severe abdominal pain.

**Table 4:** Details of Women Required Operative Intervention (n= 5)

Case	GA weeks	Indication	Cyst size (mm)	Histology
1	7	pain	49 $\times$ 45 $\times$ 39	Fibroma
2	8	pain	50 $\times$ 46 $\times$ 34	Functional cyst
3	9	pain	26 $\times$ 39 $\times$ 44	Corpus luteum
4	16	Suspicious mass	108 $\times$ 91 $\times$ 62	Mature cystic teratoma
5	22	pain	52 $\times$ 50 $\times$ 60	Serous cystadenom

## Discussion

Ultrasonography has been widely used as a routine component of antenatal care. During the assessment of the fetus and the placenta, an adnexal mass may be discovered at the time of the ultrasound examination, which pose a diagnostic and management challenge to the physician [3].

The frequency of adnexal mass in this study was 12% in the first trimester with spontaneous regression in 88.5% women, leaving only 3.3% beyond the second trimester. The reported incidence of adnexal masses in pregnancy varies. Prospective studies reported an incidence of 6% to 25% and most of these masses were functional ovarian cysts resolved during pregnancy, leaving between 0.8% and 1.7% of persistent masses [11-14]. These results are in accordance with the findings of the present study. However, Goh *et al* [6] found that 1% of all pregnancies had adnexal mass and this is much lower than our findings of 12%.

Torsion occurred in 4.9% and rupture occur in 1.6% of women. The reported rate of torsion is highly variable. Condous *et al* [11] reported suspected and likely torsion rates of 2.5% and 0.6%, respectively. Another observational study reported torsion in 0.4% and rupture of the mass in 0.2% [15]. This result is lower to what was found in this study. However, some investigators reported a 0% torsion rate [12,16], while others have a rate of up to 14.8% [17].

In the present study, operative interventions (ovarian cystectomy) was required in 5 women, four of them because of acute pain and one because of suspicious mass which appeared to be big mature cystic teratoma; and most of them sized more than 5 cm. Similarly, researchers indicated that the risk of torsion increases with the increase in the size of the mass [16-18]. The histological diagnoses of the studied biopsies in the present study revealed mature cystic teratoma, serous cystadenoma, fibroma, corpus luteum of pregnancy and functional cyst and none of the adnexal masses were found to be malignant. Koo *et al* [19] indicated that the most common reported cysts were mature cystic teratoma, endometrioma, serous and mucinous cystadenoma and corpus luteum of pregnancy.

Adnexal masses may associate with a poor obstetric outcome caused by a mechanical effect, increased risk of abortion, preterm delivery, and dystocia [1,2,20,21]. Likewise, abortion was encountered in 14.8% of women in the present study.

The study had some limitations due to the limited sample size of the population and the need for subsequent follow-up scans. Further studies are recommended in big groups and throughout pregnancy and immediate postpartum to characterize the presentation and the complications, as well as establishment of guidelines on how to manage and follow-up ovarian masses during pregnancy.

## Conclusion

Ovarian mass was encountered in 12% of the study group and most being asymptomatic and self-resolving.

The current findings support conservative management for asymptomatic small simple cysts diagnosed during pregnancy.

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