Clinicopathological characteristics of adnexal lesions diagnosed during pregnancy or cesarean section

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Summary

Objective: The diagnosis of an incidental adnexal lesion during pregnancy has become more common after the widespread use of routine ultrasonography (US). The aim of this study was to examine the diagnostic approach, management strategy and the pathological findings in cases of adnexal lesions that were diagnosed and treated during pregnancy in our department. *Materials and Methods:* This was a 15-year retrospective study. Cases of adnexal lesions detected during routine prenatal care by US or while performing cesarean section, between January 1996 and December 2010 at Aretaieion Hospital of the National University of Athens, were analyzed. *Results:* In this study period 39 cases of adnexal lesions were diagnosed during pregnancy or cesarean section. The age of the women was between 21 and 40 years (mean age 32.4). Surgical excision of the lesions was decided in 32 cases and conservative treatment was followed in the remaining seven cases. Surgical removal of the lesions was performed during cesarean section in 13 cases of term gestations and in four cases of preterm gestations in which pregnancy termination was considered necessary. Laparotomy during the antepartum period led to excision of adnexal lesions in 15 cases. Histology revealed benign ovarian lesions in 25 cases (78.1%), borderline ovarian tumors in two cases (6.3%), malignant ovarian tumors in four cases (12.5%) and adenocarcinoma of the appendix in one case (3.1%) presenting as an ovarian mass. *Discussion:* The management of cases diagnosed with adnexal lesions during pregnancy remains controversial. According to the literature, the estimated risk of malignancy for adnexal masses during pregnancy is low (2-3%) and complications of these lesions are extremely rare. These data suggest that adnexal masses could be managed conservatively if possible with US follow-up. On the other hand, the results of this study showed a higher incidence of malignancy among adnexal lesions that were surgically treated (15.6%). *Conclusion:* Surgical intervention and histological examination in cases suspicious for malignancy at US and clinical findings remain the treatment of choice even during pregnancy.

Key words: Adnexal lesions; Ovarian cancer; Pregnancy; Cesarean section.

Introduction

The diagnosis of an asymptomatic adnexal lesion during pregnancy has become more common after the widespread use of routine ultrasonography (US). According to the literature 1-2% of pregnant women are diagnosed with an adnexal mass [1, 2]. The most commonly diagnosed adnexal masses during pregnancy after histological evaluation are mature cystic teratomas, endometrioid cysts and corpus luteum cysts [3]. On the other hand, the risk of malignancy for adnexal lesions diagnosed during pregnancy is only 2-3% [4-7]. Despite this low incidence of ovarian cancer among adnexal lesions observed during pregnancy, it is considered to be the second most frequent gynecological cancer complicating pregnancy [4]. The therapeutic approach in cases of asymptomatic adnexal lesions that persist during pregnancy remains controversial. The difficulties in the preoperative differential diagnosis of these lesions and the possibility of malignancy that is not always easily excluded according only to US findings, suggest that surgical intervention and histological examination are often necessary for the final diagnosis.

Women with obvious US findings of benign, small in diameter, simple ovarian cysts, without vascularization or solid components, could undergo conservative management during pregnancy with routine US follow-up. In these cases, whenever a cesarean delivery is performed for obstetrical indications, ovarian cystectomy can be performed at that time, avoiding the possible adverse effect of surgery and anesthesia during the antepartum period to the fetus and the mother [8]. This approach is reinforced by the fact that US can assist in determining which patients are at risk for malignancy and require antepartum surgery, as opposed to those with benign indications in which postponing the surgery until the delivery or postpartum period seems to be the ideal strategy [8, 9].

In cases of mature cystic teratomas there are studies [10, 11] which suggest the surgical removal during the second trimester because these lesions influenced by hormonal changes during pregnancy seem to have a higher growth rate.

The aim of the present study was to analyze the diagnostic approach, management strategy, surgical outcome and final pathological findings in cases of adnexal lesions that were diagnosed and treated during pregnancy in our department.

Materials and Methods

This was a 15-year retrospective study. During the period between January 1996 and December 2010, there were 39 cases of persistant adnexal lesions diagnosed during either routine

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prenatal care, or as incidental finding while performing cesarean section and examination of the adnexae.

Patients with adnexal masses diagnosed during pregnancy that resolved spontaneously and did not require surgical management were excluded. Also, seven out of these 39 cases had benign US characteristics and conservative treatment without a surgical approach was decided. None of these patients underwent surgery even after the postpartum period. These cases were excluded as well from the present study. The rest of the 32 pregnant women diagnosed with adnexal lesions underwent surgical intervention. All lesions were removed and sent to the pathology laboratory for macroscopic and microscopic examination.

Data collection included age, gestational age (at the time of diagnosis, surgery and delivery), US findings, surgical, maternal and neonatal outcome, histological type of the lesions and possible adjuvant therapy that followed.

Table 1. — *Histological findings after surgical excision of adnexal lesions diagnosed during pregnancy or cesarean section.*

Histology	Cases (no.)	%
1) Benign lesions	25	78.1%
Luteinizing hormone ovarian cyst	17	53.2%
Cystadenoma		
Serous	5	15.6%
Mucinous	1	3.1%
Endometrioid cyst	1	3.1%
Mature cystic teratoma	1	3.1%
2) Malignant tumors	5	15.6%
Dysgerminoma	2	6.3%
Krukenberg tumor	1	3.1%
Serous ovarian cystadeno carcinoma	1	3.1%
Adenocarcinoma of the appendix	1	3.1%
3) Borderline tumors	2	6.3%

Results

During the study period there were 32 pregnant women diagnosed with adnexal lesions that required surgical management. The age of the women was between 21 and 40 years (mean age 32.4).

Of the 32 cases, nine patients (28.1%) underwent elective exploratory laparotomy during the second trimester, while in the same gestational period six cases (18.8%) had emergency exploratory laparotomy (5 from torsion and 1 due to rupture). Also, in four preterm gestations (12.5%) exploratory laparotomy and cesarean section at the same time were performed because of suspicious clinical and US findings that led to the termination of the gestation. In 13 cases (40.6%) of term gestations adnexal lesions were removed during cesarean section (in 7 cases these masses were incidental findings while performing cesarean section and examination of the adnexae).

In 28 cases (87.5%) the adnexal lesions were unilateral, while in four cases (12.5%) bilateral. In the vast majority of the cases (81.3%) the masses were cystic or partly cystic measuring between 5 and 20 cm in maximum diameter (mean diameter 12.5 cm). In 18.7% of the cases the adnexal tumors were found to be solid, measuring between 3.5 and 12 cm in maximum diameter (mean diameter 6.5 cm).

Histology revealed benign ovarian lesions in 25 cases (78.1%) (Table 1). The most common benign adnexal lesions were the luteinizing ovarian cysts, diagnosed in 14 cases. Also, in three cases there were extensively luteinized ovaries with ectopic decidual nodules of the omentum discovered during cesarean section. In six cases histology revealed the presence of cystadenoma (5 serous and 1 mucinous) in which cystectomy was performed. The other two cases of benign lesions were an endometrioid cyst and a bilateral mature cystic teratoma which were entirely removed.

Borderline ovarian tumors were diagnosed in two cases (6.3%) in which surgical intervention was performed during the antepartum period. Both cases were treated conservatively with unilateral salpingo-oophorectomy and were classified at Stage IA according to the FIGO staging system.

Malignant tumors were diagnosed and removed in five cases (15.6%). In a case of a 33-year-old Greek woman who underwent cesarean section for obstetrical indications at term gestation, a mass was diagnosed while performing the examination of the right adnexa, rising from the appendix, with a maximum diameter of 2.5 cm. Frozen section of the tumor was positive for adenocarcinoma. Right semicolectomy and regional lymphadenectomy followed. Of the 20 removed lymph nodes one was found positive for malignancy. The patient received adjuvant chemotherapy and remains well without evidence of disease.

In one case of preterm gestation, bilateral Krukenberg tumors, metastatic from gastric cancer, were excised at termination of the gestation at the 28th week. Cesarean section was performed and a male stillborn preterm neonate was delivered. Total abdominal hysterectomy with bilateral salpingo-oophorectomy followed.

In another case of preterm gestation in which the US findings led to termination of the gestation with cesarean section, frozen section of the lesion and final histological examination of the surgical specimen showed ovarian serous cystadenocarcinoma. The patient underwent total abdominal hysterectomy with bilateral salpingo-oophorectomy and omentectomy after cesarean section. Staging according to FIGO after exploratory laparotomy and histological examination was IIa and the patient received adjuvant chemotherapy with cisplatin and paclitaxel.

Finally, two cases of dysgerminoma both at Stage Ic were diagnosed after cesarean section followed by unilateral salpingo-oophorectomy, biopsies of the contralateral ovary, omentectomy and elective pelvic lymphadenectomy in a term and preterm gestation, respectively. Diagnosis of the masses was performed with the use of routine US in the case of preterm gestation, while in the other case it was an incidental finding while performing the cesarean section. Both patients had an excellent perinatal outcome and received chemotherapy with cisplatin and etoposide.

Twenty-four term neonates were born (75%) with an Apgar score of 10 at 5 min and adequate weight. They required no incubators. Eight preterm neonates were born

(25%) with satisfactory outcomes. Of the 15 women who underwent exploratory laparotomy during the antepartum period seven had vaginal delivery, while in the other eight cases cesarean section was performed.

Discussion

Most pregnant women with adnexal tumors are asymptomatic [4, 12-14]. In the present study, 78.1% of patients were asymptomatic and diagnosis was an incidental finding mainly arrived at by chance during US examination for routine prenatal monitoring, or during a cesarean section. US is considered to be the best diagnostic approach to detect adnexal lesions in pregnant and non-pregnant women [15]. Several studies suggest that the sonographic characterization of the adnexal masses can be sufficient to determine which patients are truly at increased risk for malignancy versus those who can be followed-up expectantly [16, 17]. With color Doppler, a pulsality index below 1.0 in a morphologically suspect area would suggest malignancy [18]. Magnetic resonance imaging (MRI) could be useful in association with US to identify the characteristics of the mass preoperatively. This examination is particularly useful in pregnant women when the differential diagnosis of an adnexal mass from possible leiomyoma is difficult [19-21]. In our study the vast majority of adnexal masses were diagnosed during routine US examination or while performing cesarean section for obstetrical indications.

In 1963, Munndell suggested that excision of an ovarian mass during pregnancy was indicated for three reasons: 1) elimination of a possible cause of dystocia, 2) danger of torsion, rupture, or hemorrhage, and 3) danger of malignancy [22]. Recent studies support the removal of all persisting adnexal masses in the second and third trimester owing to the risk of malignancy [23]. On the other hand the most numerous and recently informed study by Leiserowitz *et al*. [24] showed an incidence of 2.15% for ovarian cancer among pregnant women with adnexal masses. These data are similar to results coming from other studies [4-7, 13]. The low incidence of malignancy among adnexal lesions during pregnancy and the sufficient results of Doppler US in the differential diagnosis between benign and malignant lesions led to the strategy of exploratory laparotomy during pregnancy only for persistent masses with suspicious for malignancy sonographic characteristics.

Remarkable is that our study showed an increased incidence of malignancy among pregnant women diagnosed with adnexal masses that were surgically treated (15.6%). According to these results surgery should not be delayed if there is high suspicion of malignancy or if the patient's clinical condition requires urgent surgical treatment. Surgery with adequate staging remains the cornerstone of ovarian cancer diagnosis and therapy during pregnancy. The decision to perform conservative or radical surgery depends on histology, degree of extension, patient's age and desire for fertility preservation. Emergency laparoscopy or laparotomy is indicated for complications such as torsion or rupture.

Most adnexal masses diagnosed during pregnancy are small functional cysts with a maximum diameter less than 5 cm. These lesions could be managed conservatively if the US characteristics are not suspicious for malignancy. If there is a larger mass (maximum diameter more than 6 cm), if its structure is more complex with solid components, if there is ascites or if it persists beyond the 16th week of gestation, surgery should be performed to rule out malignancy [6, 14, 16, 24]. A delay in elective surgery is suggested until weeks 16-18 if there is suspicion of a low malignancy mass, thus reducing the risk of miscarriage due to hormonal independence of the corpus luteum starting at this gestational age.

In contrast with other studies [25] which suggested that an adnexal mass might be associated with an adverse perinatal outcome, we did not recognize differences in perinatal mortality, congenital malformations or Apgar scores of neonates between cases with and without these lesions.

Differences according to the epidemiology of benign ovarian lesions during pregnancy were also observed between our study and previous studies [3, 8]. In the present study the most common benign adnexal lesions were the luteinizing ovarian cysts and not the mature cystic teratomas. The incidence of endometrioid cysts among adnexal lesions diagnosed and treated during pregnancy was extremely low in our study as well.

In conclusion, surgical intervention and histological examination in cases suspicious for malignancy at US and clinical findings remain the treatment of choice even during pregnancy. The generally good prognosis for pregnant women diagnosed with ovarian cancer may be due to early-stage diagnosis of the disease because of both the widespread use of routine US examination for prenatal monitoring and the increased percentage of cesarean section for delivery.

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