Ovarian tumor in pregnancy – a case report and literature review

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Summary

Ovarian tumors develop in 2.3–8.8% of pregnant women. They are usually detected during a routine transvaginal ultrasound scan in the first trimester of gestation. Most of them regress spontaneously after the 10th week of pregnancy. From the histological point of view, the most common lesions include retained corpus luteum, mature teratomas as well as serous or mucinous cystadenomas.

This paper presents a case of an ovarian tumor detected in the 13th week of gestation. Due to the size of the lesion (20 cm in diameter), the risk of it being malignant, pain reported by the patient and potential influence of the tumor on fetal development, it was decided to implement surgical treatment. The tumor was enucleated sparing the ovary, and a histological examination revealed *teratoma adultum cysticum – struma ovarii dextri.*

Key words: ovarian tumor; pregnancy; surgical treatment

INTRODUCTION

Ovarian tumors in pregnancy are rare. According to various population-based studies and meta-analyses, they are observed in 2.3–8.8% of pregnant patients. Over 95% of these lesions are benign. The remaining ones – approximately 2–13% of all tumors detected in pregnancy – are malignant [1–4]. Most ovarian lesions do not cause any symptoms. Sometimes patients can experience abdominal pain caused by tumor torsion or rupture, which is a rare phenomenon (3–15% of patients) [2,5]. Lesions in the uterine adnexa during pregnancy are usually diagnosed in a routine transvaginal ultrasound scan in the first trimester of gestation [1–3].According to Canadian population-based studies conducted in the group of 11,095 pregnant patients between the 6th and 14th week of pregnancy, both ovaries can be visualized in 95.7% of women. The ability to visualize both ovaries at a later period of time decreases considerably [6]. Aggarwal and Kehoe [4] conducted a data base analysis involving pregnant patients with ovarian tumors encompassing a period of 25 years. Most of these lesions were detected in the first trimester of gestation [4].

The character of ovarian lesions can be differentiated with a greater accuracy using a 3D ultrasound examination with Doppler flow assessment. It enables the visualization of a "ring of fire" – a sign typical of a corpus luteum cyst, or the picture of an endometrial

cyst. Moreover, other traits that raise suspicions of malignancy can be seen, such as a map of blood vessels in the tumor or internal papillary projections. It is thought that the sensitivity and specificity of such imaging amounts to 88% and 96%, respectively [7–9]. In doubtful cases, diagnostic guidelines of the International Consensus Meeting [10] and American College of Obstetricians and Gynecologists [11] recommend the second stage of assessment using magnetic resonance imaging (MRI). It seems to be safe throughout the entire pregnancy. However, it is recommended to be conducted after organogenesis [9]. Tumor marker CA 125 is of limited value since its concentration is elevated in the first trimester of gestation. The literature reports say that its levels exceed 65 IU/ml in 16% of patients [2,9].The diagnostic value of HE4 during pregnancy, assessed in few studies, seems controversial [12].

Most benign ovarian lesions in pregnant patients regress spontaneously at the end of the first trimester (usually after 9 or 10 weeks of gestation) [2,38]. If an ovarian lesion persists in the second trimester and it exceeds 10 cm, grows continuously, causes symptoms

Fig. 1. Ovarian tumor visualized upon opening of the abdomen

or raises suspicions in imaging or biochemical examinations, surgical management is justified. Preferably, it should be conducted after the 15th week of pregnancy, mainly because of minimal hormonal dependency on progesterone secretion by the corpus luteum [1,2,7,9].

In their literature review, Hoover and Jenkins [8] analyzed the frequency of benign ovarian lesions that persisted to the second trimester and were subsequently verified histologically. The most common lesions were: retained corpus luteum (13–17%), mature teratomas (7–37%), serous cystadenomas (5–28%), mucinous cystadenomas (3–24%), endometrial cysts (0.8–27%) and paraovarian cysts (<5%).

CASE REPORT

A tumorous lesion of the right ovary was detected in a primipara in the 13th week of gestation. The largest dimension amounted to approximately 20 cm. The lesion reached up to the dome of the diaphragm. A transvaginal US examination revealed a cystic tumor on the right side that could correspond to the tumor of the right ovary. The lesion measuring 15 x 20 cm was multilocular with numerous septa, with no signs of angiogenesis and without endo- and exophytic projections. Complete blood count was normal. Marker levels were as follows: HE4 35.10 pmol/l, CA 125 39.80 U/ml, ROMA test 3.550% (normal). The fetus was developed normally, the CRL corresponded to week 13 + 1 day of gestation, BPD – 13 weeks + 4 days, the chorion was not separated and markers of genetic defects were negative. The fetal anatomy assessed in the first trimester was normal.

Due to tumor heterogeneity and its size, an abdominal and pelvic MRI scan was conducted. It revealed a cystic, multilocular lesion with a solid element with 2 cm in diameter. Upon the implementation of progestogens in the 14th week of gestation (Duphaston 2 x 10 mg p.o. and lutein 2 x 100 mg p.vag.), operative treat-
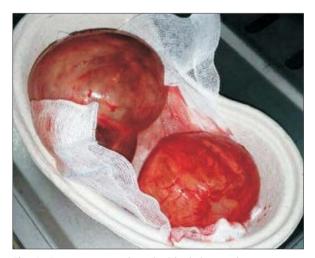

Fig. 2. Two tumors enucleated with their capsules

Fig. 3. Right ovary after enucleation of the tumors

ment was conducted. Once the abdominal cavity was opened with a simple incision and two joined tumors with a total diameter of 20 cm were visualized, they were enucleated retaining their capsules. An intraoperative histological examination revealed tumors with no signs of malignancy, probably of a teratoma type. The size of the uterus corresponded to week 14 of pregnancy. The abdominal wall was closed with a double layer suture; blood loss was approximately 20 ml. The final histological examination revealed two multilocular cysts with the diameter of 11 and 9 cm described as *teratoma adultum cysticum – struma ovarii dextri*. One of the compartments held structures of colloidal mass. The postoperative period was uneventful. The patient was discharged in a good overall condition.

DISCUSSION

Ovarian tumors in pregnancy are a clinical challenge. On the one hand, the diagnostic process should be as accurate as possible and adequate treatment should be implemented. On the other hand, however, the safety of the fetus must be borne in mind enabling it to reach maturity to be able to live beyond the maternal uterus. In the case presented above, the second-stage imaging (MRI) was conducted because of doubts that appeared after the ultrasound examination: the lesion was multilocular with the diameter of 20 cm and varied cystic-solid echogenicity. In simple, unilocular ovarian cysts measuring 5–6 cm, there is diagnostic–therapeutic agreement: observation and conservative treatment. The risk of malignancy in such cases is low (1%) [2,4,6,9]. In lesions suspected of a malignancy, particularly when the size is considerable, the decision concerning the second-stage imaging is justified [10,11]. Computed tomography (CT) is considered unsafe because the radiation dose to which the fetus is exposed is 2–4 cGy. Magnetic resonance imaging (MRI), however, seems to be safe, particularly after organogenesis, and gadolinium does not have teratogenic properties [13]. In the

case of teratoma-like lesions, MRI is capable of detecting their typical fat masses whereas in malignant tumors, it helps to determine whether the surrounding tissues are infiltrated or not [8,9,13] Tumor marker CA 125 is of limited value due to its increased concentration in pregnancy [2,9,14]. The data concerning HE4 in the pregnant are based on small groups and not considered unambiguous [12,13]. According to the studies conducted by Anton et al. [15], MRI is the most accurate modality in differentiating the nature of a tumor. The only biochemical marker of the benign ovarian tumor was in this case the normal ROMA algorithm of 3.550% [16]. Pain reported by the patient was an additional factor that justified surgical treatment. Moreover, the risk of tumor rupture during pregnancy or delivery, the risk of a birth obstacle, potential influence of the tumor on fetal development and the risk of preterm birth were additional factors that contributed to such a decision.

The histological examination revealed *teratoma adultum cysticum – struma ovarii*. Colloid was found in one of the tumors. Mature teratomas are usually cystic. They contain various tissues (usually fluid, sebum, hair and bony tissue). Tumors of the *struma ovarii* type are composed in their greatest part of thyroid tissue. That is why 10% of patients develop signs of hyperthyroidism, which was not observed in the patient presented above. To conclude, the management in the case of ovarian tumors in pregnancy should ensure optimal diagnosis and treatment by putting the lowest risk possible to the fetus.

CONCLUSIONS

1. In the case of pregnant women presenting with ovarian tumors of considerable sizes that are suspected of a malignancy, surgical treatment is justified.
2. Surgery should be preceded with accurate imaging and biochemical diagnostic process, taking into account all pregnancy-associated limitations.

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