

## Case Report

## Prenatal ultrasound diagnosis of abdominal pregnancy of ovarian origin

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## Summary

In abdominal pregnancy, as a result of massive hemorrhage, fetal and maternal mortality is high. The authors present a case study in which the ovarian origin abdominal pregnancy was detected in the second trimester by sonography and confirmed during the operation and also with histology. By previously not confirmed uterus didelphic or bicornuate uterus, the obstetrician should suspect the possibility of abdominal pregnancy. Placental location on the uterus is a major positive factor of outcome for abdominal pregnancies. For the differential diagnosis of abdominal pregnancy is important to verify both ovaries.

**Key words:** Abdominal pregnancy; Ovarian pregnancy; Prenatal diagnosis; Ultrasound.

## Introduction

Abdominal pregnancy is very rare, but as a result of massive hemorrhage, maternal morbidity is high, which complicates management. Maternal mortality decreased in the last two decades, today it is in the range 0.5% to 20%. Perinatal mortality rate is between 40%-95% [1, 2]. Prenatal diagnosis, especially after the first trimester is a challenge [3, 4]. Only every second case is detected before delivery even when ultrasound examination was made during the pregnancy [5]. Abdominal pregnancy is classified into primary and secondary types. By primary abdominal pregnancy the embryo is directly implanted in the peritoneal cavity. Secondary abdominal pregnancy is defined as tubal or ovarian pregnancy that ruptured and that then reimplanted in the abdomen. Evaluation preoperatively the origin of abdominal pregnancy with ultrasound is possible only in few cases. The authors present a case study in which the ovarian origin abdominal pregnancy was detected in the second trimester by sonography and confirmed during the operation and also with histology.

## Case Report

A 20-year-old primigravida was diagnosed with uterus duplex at the 11 weeks gestation in a private ambulance. At the 18 gestational week it was confirmed at the local hospital. She was admitted at 24/5 weeks to this department with a diagnosis of oligohydramnios, placenta praevia, intrauterine growth restriction, and transverse fetal lie. Two days later repeated transabdominal sonographic examination showed an anteverted uterus with an empty endometrial cavity (Figure 1). Abutting on the posterior wall, outside of the uterus there was a placenta. A single, viable fetus in transverse position within a membranous sac was also identified.

The estimated fetal weight was 424 grams. Amniotic fluid index was 4.05 cm. There was no detectable anomaly in fetal anatomy.

The authors found a lack of myometrium surrounding the gestational sac. Integrated, on the left corner of the fetal sac, an almond-shaped structure, with hypoechoic regions was visible. Diameters of the suspected left ovary were: 32×21 mm (Figure 2.) Right ovary was detected separate from the fetal sac. The fallopian tubes were not verifiable. The authors counseled the woman regarding the fetal and maternal risks of the suspected abdominal pregnancy and also about the fetal consequences of premature delivery. The pregnant woman decided to continue her pregnancy. Antenatal corticosteroid therapy was administered for fetal lung maturation.

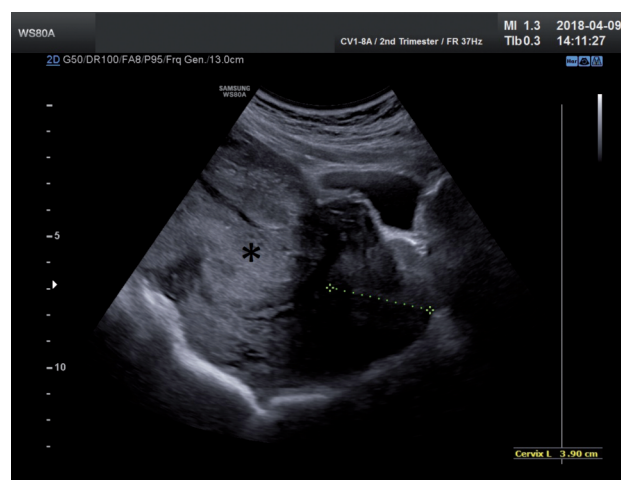


Figure 1. — Longitudinal transabdominal gray-scale image of empty uterus (caliper on cervical channel) and extrauterine abdominal pregnancy with the placenta (asterisk) abutting the posterior wall of the uterus.

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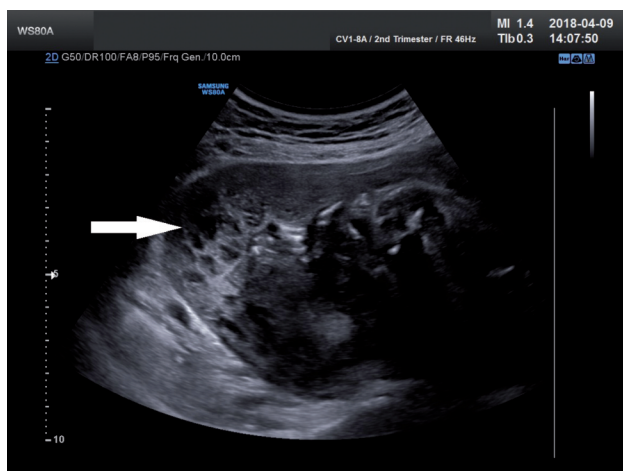


Figure 2. — Transverse transabdominal gray-scale image. There is no myometrium around the fetal sac. Integrated in the wall is the left ovary (white arrow).

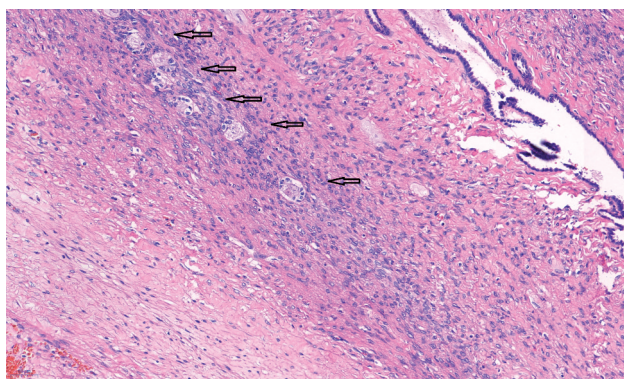


Figure 4. — Histologic examination of the fetal sac. The arrows show the ovarian follicles. (Hematoxylin-Eosin, magnification:  $\times 200$ ).

Continuous fetal and maternal monitoring were performed during the next two weeks. At 27 weeks of gestation control, ultrasound examination verified anhydramnion (AFI: 1.0 cm). The authors found reversed “a” wave by the ductus venosus flow assessment; CTG was non-reactive.

After informed consent the authors performed a laparotomy and a male baby weighing 600 grams was delivered. At the position of the left ovary was implanted the fetal sac. The left ovary was connected to the uterus by the ovarian ligament (Figure 3). After electrocoagulation of the adhesions with the great omentum, the placenta was macroscopically completely removed. The uterus with both intact fallopian tubes and the right ovary were preserved. At the end of the abdominal surgery the cervix was dilated and curettage was performed to remove the decidual tissue and avoid hematometra. The patient received two units erythrocyte concentrate transfusion during the surgery. Postoperatively the mother was hemodynamically stable and after 24 hours she left the intensive care unit. Histological examination confirmed ovarian tissue (both follicles and stroma) in the fetal sac (Figure 4).

The authors assessed serum  $\beta$ -hCG levels during the puerperal period. Six weeks after the delivery, serum  $\beta$ -hCG value was under the measurable level. At this time ultrasound examination revealed

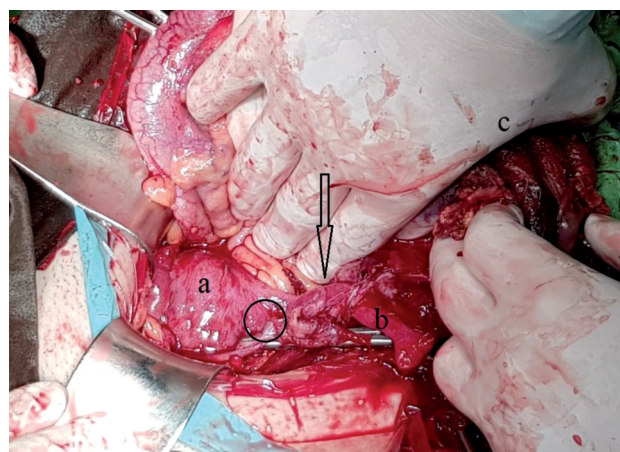


Figure 3. — Intraoperative image. Ruptured left ovary (arrow) is connected to uterus by the utero-ovarian ligament (circle). a): non-pregnant uterus, b): left intact fallopian tube, and c): part of the separated placenta.

no placental tissue in the abdominal cavity.

The newborn infant left the neonatal intensive care unit in good condition after seven weeks. Laser photocoagulation therapy for the treatment of retinopathy of prematurity was necessary. There was no other neonatal morbidity or neuroimpairment in the first five months. The neonate has no other developmental malformations, only a mild form of hypospadias.

## Discussion

Ovarian pregnancies are extremely rare, representing 1% of ectopic pregnancies [6, 7]. The incidence is 3–6% among ectopic pregnancies after assisted reproductive technologies procedures [8]. Unlike tubal gestation, ovarian pregnancy is associated with neither pelvic inflammatory disease nor infertility. The only known risk factor is the current use of intrauterine device. In this case there was no IUD use in the anamnesis [1]. In the first trimester, unruptured ovarian pregnancy can mimic an ovarian malignant tumor [9]. If ovarian pregnancy advances to secondary abdominal pregnancy, the involved ovary can mimic degenerating fibroids and makes it difficult to make a correct diagnosis.

In the present case, the reason for the early misdiagnosis was the unconfirmed idea of uterus duplex. Both abdominal and ovarian pregnancies are so rare, that obstetricians often do not think about it, concentrating on evaluating the fetus. Amal *et al.* previously reported a full-term abdominal pregnancy, by a primigravida where it was only proven at the elective caesarean section that it was not a bicornuate uterus. In the present case, the recognition was later also complicated by the fact that the placenta adhered to the posterior wall of the uterus. Thus it imitated complete placenta previa. Beddock *et al.* reported a case where placenta was located on the uterus and at 37 weeks of gestation planned delivery with good outcome resulted [10]. The present case also confirms that placental location on the uterus is a major

positive factor of outcome for abdominal pregnancies. Involving other organs into the placental circulation elevates the risk for complication [11]. Discontinuity of the cervical channel and the uterine cavity, or narrow waist in the lower uterine segment is suspicious for abdominal pregnancy. Clinical presentation like in this case: abnormal fetal position, oligohydramnios, and pregnancy that is small for gestational age, can help to make correct diagnosis.

If abdominal pregnancy is diagnosed before 20 weeks of gestation, there is a chance to terminate the pregnancy. Diagnosis of advanced extrauterine pregnancy does not necessarily justify the termination of the pregnancy, because abdominal pregnancies can progress into the third trimester [12]. Stevens reported that 63% of infants born after 30 weeks survived [13]. Inpatient management in every case is obligatory for optimal outcome, because apparently unexpected fatal events can occur. Outside of the uterus, unfavorable conditions leads to placental insufficiency. Growth restriction, oligohydramnios, placental abruption and, rupture of the membrane are the consequences.

In abdominal pregnancies, there is a high incidence of fetal malformations ranging from 20% to 40%. The consequence of oligohydramnios and pressure deformities include fetal pulmonary hypoplasia, and facial and limb asymmetry. [14]. In the present case, besides growth restriction, the newborn also had hypospadias, what is a common, non-specific developmental malformation.

## Conclusion

The authors conclude that in pregnancies complicated previously not confirmed with uterus duplex or bicornuate uterus, the obstetrician should pay attention to the possibility of an abdominal pregnancy. Identifying continuity of the cervical canal and of endometrial cavity are necessary. For differential diagnosis of abdominal pregnancy, it is important to verify both ovaries.

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