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Successful operative management of an intact second trimester abdominal pregnancy with additional preoperative selective catheter embolization and postoperative methotrexate therapy

Authors' Contribution:

- A** Study Design
- B** Data Collection
- C** Statistical Analysis
- D** Data Interpretation
- E** Manuscript Preparation
- F** Literature Search
- G** Funds Collection

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Summary

Abdominal pregnancy is a rare condition that may lead to severe complications.

The authors report the case of a 17-week intact abdominal pregnancy diagnosed in the course of an investigation of lower abdominal pain. Ultrasonography and MR examination revealed an intact abdominal pregnancy. Subsequent angiography was performed to occlude the supportive artery of the pregnancy by selective embolization. The pregnancy was terminated safely by laparotomy a day later. The placenta was left in the abdominal cavity because of the high risk of massive and often uncontrollable bleeding, and treatment with methotrexate was applied postoperatively.

Conclusions:

Preoperative embolization and the postoperative methotrexate therapy facilitate the safe surgical treatment of abdominal pregnancy.

key words:

abdominal pregnancy • embolization therapy • magnetic resonance imaging • methotrexate • placental tissue

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BACKGROUND

Abdominal pregnancy is a rare and serious form of ectopic pregnancy. Reports on its frequency vary, ranging from 1 in 3371 deliveries to greater than 1 in 10 200 deliveries [1-3]. The maternal mortality risk from abdominal pregnancy is 7.7 times greater than that of tubal ectopic pregnancy [4,5]. The treatment of these cases requires attention due to the risk of life-threatening bleeding arising from the rupture of the fetus. Maternal morbidity can also be substantial, with high incidence of pelvic abscess, peritonitis, and sepsis caused by retained placental remnants. Fetal mortality is high, ranging from 75% to 95% of all reported cases [1,3].

CASE REPORT

A 28-year-old patient (gravida 3, para 2, with 1 caesarean section in the history) was referred to our department by her general practitioner, with lower abdominal pain developed 3 weeks before.

The physical examination verified abdominal tenderness, principally at the right side of the lower abdomen and around the umbilicus. Vaginal examination revealed a slightly enlarged uterus. The region of the Douglas-pouch was sensitive, but not bulged.

Both transabdominal and transvaginal examinations were performed. Transvaginal sonography described the uterus 70×89 mm in size with no visible fetus in the cavity. Above the uterus at the right side an amniotic cavity was seen, in which the fetus was visible in an oblique-breech presentation. Fetal heart rate was detectable. Biometric data (biparietal diameter (BPD): 44 mm, head circumference (HC): 145 mm, abdominal circumference (AC): 104 mm, femur length (FL): 24 mm) corresponded to a 17–18-week-old fetus without any signs of malformation. The quantity of the amniotic fluid was normal, the placenta was attached to the right back side, and both ovaries were normal.

Laboratory evaluation (red blood cell count, hemoglobin, hematocrit, white blood cell count, platelet count, Westergren) did not show any clinically significant abnormality.

Pelvic MRI (with native multiplane, multisequential imaging) showed that above the urinary bladder in the pelvis minor a 60 mm thick uterus was visible with STIR (short tau inversion recovery) sequence and T2 enhancement. Above the uterus risen from the right iliac region there was a 50×60 mm thin walled cystic object with embryonic elements inside (skull, orbit, lambda suture could be observed) which were also visible with long-period sequences. Without contrast material the exact location of the placentation was not precisely determinable, but it was found that the outer surface of the uterus did not communicate with the fetus.

Control ultrasound examination revealed that the placenta was situated in the right hip plate. The uterus was seen farther on.

The patient was referred to the Department of Cardiovascular Surgery, Semmelweis University, for a selective angiography and embolization. Selective angiography verified a normal upper and lower as well as internal iliac artery. In the height

of the right renal artery a winding artery was noticed running towards the pelvis minor, which was suspected to be the ovarian artery. This artery was hypertrophic, thicker than usual, with a winding shape, and seemed to supply a parenchymal bulge situated to the right of the uterus. Other branches were leading to the uterus. A selective embolization of this artery was performed with PVA (polyvinyl alcohol) particles. During the control angiography, minimal parenchymal perfusion was seen (Figures 1, 2).

The control ultrasound examination showed no signs of fetal life.

In the perioperative period, antibiotic treatment was administered: 3×1.5 g cefuroxime intravenously, and 2×250 mg metronidazole orally.

A day after the selective angiography and embolizations, a lower midline laparotomy was performed in general anaesthesia. Some reddish fluid was found in the abdominal cavity. The omentum was adhered to the anterior abdominal wall and to the urinary bladder. After adhesiolysis, it became visible that the fetus was situated in the lower right region of the abdominal cavity, adhered to the colon descendens and to the small intestine. The membranes were separated until the edge of the placenta. As the complete removal of the whole fetus without the risk of life-threatening bleeding was not possible, the membrane was ruptured artificially and the fetus was removed. The umbilical cord was clamped, cut and stitched at its origin. Significant bleeding was not noticed. The abdominal incision was drained and sutured.

In the postoperative course, intramuscular methotrexate therapy was administered (20 mg/m² twice a week, a total of 5 times). Serum beta hCG levels were monitored every day. Ablation was started with bromocriptine therapy and the antibiotic treatment was completed with intramuscular gentamicin with the dose of 1×240 mg each day.

On the 7th postoperative day ultrasound examination was performed. At the right side of the lower abdomen a 59×49 mm solid bulge – the retained placenta – was seen. The autopsy revealed a male fetus, 20 cm long, weighting 146 grams. There was no congenital malformation visible.

The patient was discharged on the 26th postoperative day, free of complaints. The serum beta hCG level was 3.98 IU/l at that time.

DISCUSSION

The majority of pregnancies located in the abdominal cavity result from reimplantation of tubal abortions; thus they cannot be considered as real (primary) abdominal pregnancies [4]. The reported case matches the criteria defined by Studdiford in 1942 [6] as being a primary abdominal pregnancy. To be considered as such, the pregnancy must meet the following criteria:

1. Intact tubes and ovaries must be normal, without evidence and signs of recent or remote injury;
2. No evidence of uteroperitoneal fistula should be found;
3. The gestation must be related exclusively to the peritoneal surface and be early enough to eliminate the possibility that it is a secondary implantation.



Figure 1. Angiographic snapshot of the supplementing blood vessels before the embolization.

Early diagnosis of an abdominal pregnancy is critical because a catastrophic hemorrhage can result from separation of the placenta. Ultrasonography is considered to be the criterion standard for obtaining exact information about the location of the pregnancy and its relation to the surrounding organs [7]. In cases where ultrasonography is equivocal, MRI may be informative. Selective catheterisation and subsequent embolization of the pelvic blood vessels was introduced in the early 1980's in gynecological practice. The main indication was massive pelvic hemorrhage (eg, in certain cases of advanced, bulky cervical cancers) [8].

In our case, embolization of the main supporting vessel leading to the placenta was performed in order to avoid a massive intraoperative bleeding and to promote the absorption of the retained placenta. Retaining the placenta in its original place is a common method during operative procedures of abdominal pregnancies. Antibiotic therapy is necessary to prevent infections caused by the retained tissue. The drainage of the placental bed is highly recommended in order to detect bleeding in the postoperative stage. Methotrexate therapy is a well-known alternative treatment in certain cases of ectopic pregnancies in order to hasten trophoblastic degeneration. In this case, it was administered in the post-operative interval to promote the absorption of the retained placenta. Involution of the gestational tissue can be controlled by monitoring postoperative beta-hCG serum levels.

Reviewing the literature regarding the management of genuine abdominal pregnancies, it is hard to find a publication explaining the same method reported by us, perhaps due to the rarity of the cases and the limited accessibility of angiography. Numerous cases are recognized only when symptoms of abdominal bleeding are present; therefore, laparotomy must be performed instantly.

CONCLUSIONS

As in the majority of cases in the literature, the outcome of our case was successful. Therefore, preoperative selective



Figure 2. The same view after the embolization.

angiography and embolization followed by laparotomy and adjuvant methotrexate therapy can be a safe and effective method in the treatment of abdominal pregnancies in the second trimester.

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