

ABDOMINAL PREGNANCY: A SYNTHETIC REVIEW FOR SURGEONS

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Abstract

Abdominal pregnancy is a very rare subtype of ectopic pregnancy, usually missed during prenatal assessment. The placenta can be attached to the uterine wall, adnexal, bowel, omentum, mesentery, liver, spleen, bladder, pouch of Douglas or large vessels. The placenta can be detach at any time during pregnancy leading to torrential blood loss.

Patients with the abdominal pregnancy have persistent abdominal and/or gastrointestinal symptoms during their pregnancy. The ultrasonography remains the main method for the diagnosis of extra uterine pregnancy during the end of the first trimester or early in the second trimester. For advanced abdominal pregnancy, magnetic resonance imaging can be useful. Abdominal pregnancy can be met by both obstetricians and surgeons, and the main technical difficulties appear at the removal of the placental tissue and for the control of the haemorrhage. Laparoscopic treatment must be considered for early abdominal pregnancy.

Definition and preclinical dates

Definition. Abdominal pregnancy is a very rare subtype of ectopic pregnancy where conceptus is implanted in the peritoneal cavity other than uterus, fallopian tubes, ovaries or uterine ligaments, with possible dramatic and catastrophic consequences for foetus and mother. Abdominal pregnancy is usually missed during prenatal assessment, despite the routine use of abdominal ultrasonography [1].

It occurs either as a result of tubal abortion or tubal rupture (secondary abdominal pregnancy) – under these circumstances, there is evidence of tubal or ovarian damage – or more rarely, as a direct implantation on the peritoneum, with normal fallopian tubes, normal ovaries, or without tubal fistula (primary abdominal pregnancy) [2].

Ectopic pregnancies can be simultaneous [3].

History. Abdominal pregnancy was reported for the first time in 1708 as an autopsy finding [4]. The first article which refers to abdominal pregnancy and can be consulted in Pubmed is a case report from 1898 [5].

In 1942, Studdiford established criteria for defining primary abdominal pregnancy: (1) normal tubes and ovaries with no evidence of recent or remote injury, (2) an absence of any evidence of a uteroperitoneal fistula, and (3) the presence of a pregnancy related exclusively to the peritoneal surface and early enough to eliminate the possibility of secondary implantation following a primary nidation in the tube [6].

Friedrich and Rankin proposed modifying Studdiford's criteria thus: (1) the presence of a pregnancy of less than 12 weeks gestational age whose trophoblastic attachments are related solely to a peritoneal surface, (2) grossly normal tubes and ovaries, and (3) the absence of uteroperitoneal fistula [7].

Epidemiology. The reported incidence of abdominal pregnancy ranges from 1 in 400 to 1 in 50,000 deliveries, and the variable incidence depends on the characteristics of a geographic region [8-9]. Approximately, abdominal pregnancy accounts for 0.1% of all pregnancies and 1.4% of ectopic pregnancies [10]. In the 90 years, it was estimated to occur in 10 out of 100,000 pregnancies in the United States [11]. Although the incidence is reduced, a physician working in a remote district with a maternity service should expect to encounter several cases of advanced abdominal pregnancy during his or her working lifetime [12].

The maternal mortality rate can be as high as 20% [13-14]. Survival of the newborn is affected with a perinatal mortality rate of 40% to 95% [15]. The site of implantation and availability of vascular supply are believed to be factors that may influence the possibility of fetal survival [4].

It is thought that abdominal pregnancy is more common in developing countries, probably because of the high frequency of pelvic inflammatory disease in these areas [16].

There are several risk factors for abdominal pregnancy: history of tubal pregnancies, pelvic inflammatory disease, tubal sterilization, tubal infertility, tubal reconstructive surgery, sexually transmitted disease, intrauterine contraceptive device in situ, the recent use of progesterone-only pills [2].

Pathology. In abdominal pregnancy, the placenta can be attached to the uterine wall, adnexal, bowel, omentum, mesentery, liver, spleen, bladder, pouch of Douglas or large vessels [17-21] (fig. 1, fig. 2). It can be detach at any time during pregnancy leading to torrential blood loss and acute anemia [22]. Highly morbidity and mortality are largely due to massive hemorrhage that may arise [23].

Advanced abdominal pregnancy carries especially a risk of hemorrhage, disseminated

intravascular coagulation, bowel obstruction, and fistula [4].

About 21% of babies born after an extra uterine abdominal pregnancy have birth defects, presumably due to compression of the fetus in the absence of the amniotic fluid buffer and vascular disruption. The most common deformations observed were facial and/or cranial asymmetry, limb deficiency and central nervous system malformations [12-13].

Clinical presentation and medical imaging

This diagnosis requires clinical suspicion, as ultrasound will miss almost 50% of abdominal pregnancies in the absence of clinical suspicion [9, 24].

Although there may be great variability in symptoms, severe lower abdominal pain is one of the most consistent findings [25]. Patients with the abdominal pregnancy have persistent abdominal and/or gastrointestinal symptoms during their pregnancy [26].

The presence of abdominal pregnancy may be suggested by recurrent abdominal pain, painful fetal movements, and easily palpable fetal parts, difficulty in establishing fetal lie and presenting part, signs and symptoms of peritoneal irritation can suggest hemoperitoneum [27-29].

The ultrasound examination findings can be repeatedly misinterpreted as normal. However, the ultrasonography remains the main method for the diagnosis of extra uterine pregnancy during the end of the first trimester or early in the second trimester, when the pelvic organs are best visualized. It usually shows no uterine wall surrounding the fetus, fetal parts that are very close to the abdominal wall, abnormal lie and/or no amniotic fluid between the placenta and the fetus [4]. Transvaginal ultrasound is superior to transabdominal ultrasound in the evaluation of ectopic pregnancy since it allows a better view of the adnexa and uterine cavity. In advanced abdominal pregnancy, visualization of pelvic organs through ultrasonography becomes limited. Magnetic resonance imaging can be useful [9-10]. Non-contrast magnetic resonance imaging using T2-weighted imaging is a sensitive,



Fig. 1 Primary abdominal ectopic pregnancy: **fetus, placenta and bowels.** (from Yildizhan R, Kolusari A, Adali F, et al. Primary abdominal ectopic pregnancy: a case report. *Cases Journal.* 2009;2:8485.)

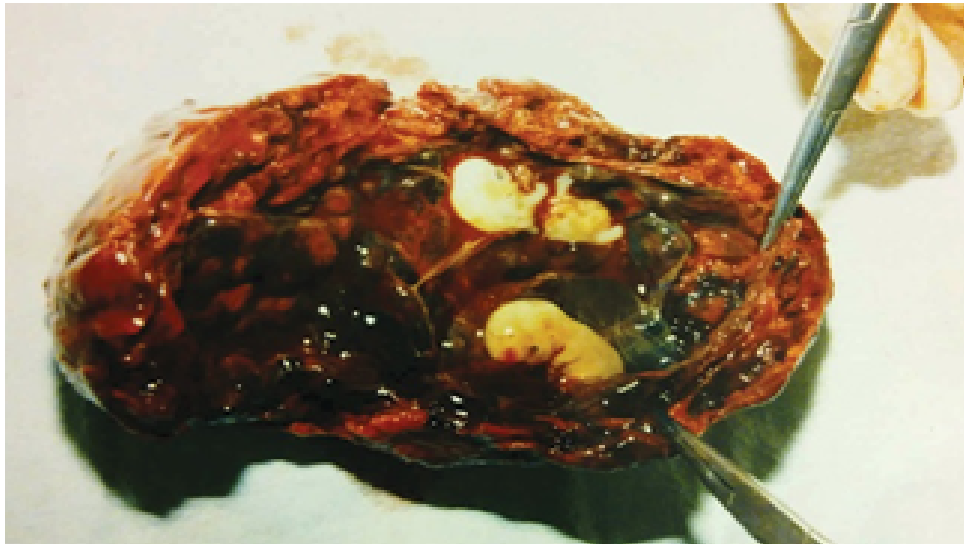


Fig. 2 Twin abdominal pregnancy: two fetuses attached to placenta. (from: Chughtai F. Twin abdominal pregnancy - A rare scenario. *J Pak Med Assoc.* 2017;67(5):793-795.)

specific, and accurate method for evaluating ectopic pregnancy [30].

SURGICAL MANAGEMENT

The principal controversy concerning management of abdominal pregnancy is the placenta. Removal of the placental tissue is less difficult in early pregnancy when it is smaller and less vascular [21]. If the placenta does not take off easily, it should be left in situ for its natural regression and for to minimize the risk of massive hemorrhage, with risk compromising the blood supply of other organs [31].

However, leaving the placenta in situ has been associated with increased postoperative

morbidity and mortality through infection or necrosis. The value of Methotrexate in managing the abdominal placenta could not be established. Removal of the placenta, when it is safely possible, gives the best results [32].

If the fetus is alive, surgery may be performed regardless of gestational age or fetal status due to difficulties in predicting placental separation. If the fetus is dead, surgery is necessary due to the risk of disseminated intravascular coagulopathy or sepsis, although a period of 4–8 weeks may be allowed for atrophy of placental vessels [33-34]. Delaying removal of a stillbirth remains controversial [12]. Perinatal death may result from either

prematurity or prolonged gestation in a compromised environment. Once the foetus has reached a viable age, there is little reason to delay delivery [12].

The laparoscopic management of abdominal pregnancy and hemoperitoneum is possible. Through the magnification of the image by laparoscopy, it is possible to completely remove the placenta and the cotyledons from the peritoneal surface [35]. Laparoscopic treatment must be considered for early abdominal pregnancy [36].

Advanced abdominal pregnancy is required open surgery. For the control of severe hemorrhage, you can try a combination of aortic compression, packing and use of large “liver” sutures incorporating the uterine wall for tamponade of the principal placental implantation site [37].

There have been many reports of advanced extrauterine pregnancy that ended with a viable fetus and a healthy mother. However, abdominal pregnancy beyond second trimester and with a viable fetus is a extremely rare condition [31, 33, 38].

If the abdominal pregnancy remains undetected and untreated and if fetal demise occurs, lithopedion formation is an expected outcome. Lithopedion formation occurs in 1.5–1.8% abdominal pregnancies [39].

Conclusion

Often undiagnosed prior to operative intervention, and prone to dramatic complications, advanced abdominal pregnancy presents special challenges to the physician.

The obstetricians and surgeons should consider abdominal pregnancy diagnosis in front of a young woman with acute surgical abdomen and hemoperitoneum.

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