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TREATING HEMORRHAGE FROM SECONDARY ABDOMINAL PREGNANCY: THEN AND NOW

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INTRODUCTION

Abdominal pregnancy is an unusual but real cause of postpartum hemorrhage. The high maternal morbidity and mortality associated with abdominal pregnancy are a function of abnormal placentation which leads to intra-abdominal hemorrhage or the aftermath of retention of large amounts of dead tissue. Presently, no evidence-based guidelines have been published on this subject. This chapter begins with a series of four cases treated at the Nowrosjee Wadia Maternity Hospital in Mumbai, India, which are illustrative of the available treatment options. Wadia Hospital is a tertiary-care center with a wide referral base, both inside the city and throughout the surrounding areas. This is followed by a discussion on the technical aspects of the surgical intervention and a review of the literature on modern treatment options.

CASE 1

In 1970, a primigravida aged 24 years was referred to the hospital with an abnormal presentation. The senior author (NAD) was practicing as a junior trainee. At that time, it was routine to confirm the diagnosis of abnormal presentation with abdominal radiography. Because the radiograph was suspicious of an abdominal pregnancy, the senior consultant planned an exploratory laparotomy to deliver the woman. A male child weighing 2700 g was delivered in good condition. However, the placenta was attached to the mesentery, and an attempt to separate it set off massive hemorrhage. Local measures such as ligation of vessels and compression failed to reduce the

hemorrhage, so the peritoneal cavity was packed under pressure with a large bed sheet as a last resort. She was stable for the first 6 h postoperatively, but then developed hypovolemic shock from intraperitoneal hemorrhage and died on the first postoperative day.

CASE 2

The second case occurred 4 years later at the same institute. A Cesarean delivery was undertaken to deliver a 30-year-old multiparous woman with no progress in labor. On opening the peritoneum, the amniotic sac was encountered directly. A 2400-g female child was delivered. The placenta covered the lateral pelvic wall and posterior surface of the uterus. The senior consultant was called and an attempt at placental separation was made. This effort was soon abandoned in view of the difficulty in separation and ensuing hemorrhage. The cord was then cut short and tied, the placenta left *in situ* and the abdomen closed. The abdomen was packed under pressure with large abdominal packs for control of the hemorrhage. However, the patient developed a disseminated intravascular coagulopathy and died within 48 h of the surgery.

CASE 3

In 1980, the senior author was involved in the third case of abdominal pregnancy. A 20-year-old primigravida was referred to the hospital at full term with abdominal pain thought to be of a surgical cause. There was a strong clinical suspicion of acute appendicitis which did not respond to conservative treatment. A

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laparotomy was performed. A full-term abdominal pregnancy was found with the sac just below the peritoneum. A female child weighing 2600 g was delivered in good condition. The placenta was firmly adherent to the right pelvic side-wall. No attempt was made to remove it. The cord was cut short and tied and the abdomen was closed with a pelvic drain. The postoperative course was complicated by fever for the first 10 days in spite of antibiotics. She continued to have abdominal pain for 6 months after delivery. This patient had sequelae of a retained placenta but survived the pregnancy.

CASE 4

Although this is not a case of an abdominal pregnancy, it is used to illustrate the management of abnormal placentation. In 2001, the senior author performed a Cesarean section for a 25-year-old primigravida at term. She was diagnosed to have an anterior placenta previa with accreta. Blood vessels were seen invading into the bladder wall on color Doppler. After delivering a 2500-g male child in good condition, no attempt at placental separation was initiated. Rather, a decision was made to leave the placenta *in situ* followed by methotrexate therapy. The woman was monitored in hospital for 3 weeks after delivery and administered a prolonged course of antibiotics. She had an uneventful course. Further follow-up was provided on an outpatient basis with color Doppler and serum β-hCG levels. The placental mass gradually involuted over a period of 5 months and the patient resumed menstruation 7 months after delivery.

INCIDENCE

Abdominal pregnancies are rare events. In the United States, it is estimated that it occurs once in 10 000 live births and once also for every 1000 ectopic pregnancies[1]. A more recent African report provides a much higher estimate of 4.3% of ectopic pregnancies, which is probably a reflection of referral patterns in that region as well as a higher baseline rate of inherent tubal disease in the patient base of the hospital catchment area[2]. However, it also may be reasonable to presume that the incidence of abdominal pregnancies may have risen over the years, considering that the risk factors such as ectopic pregnancy, infertility from tuberculosis and endometriosis, pelvic infections and infertility treatments are more common today. Regardless, an obstetrician practicing alone may never come across an abdominal pregnancy in a career spanning decades. In the singular instance where he/she does have the need to treat such a patient, it may be in circumstances far from ideal. Although unusual, obstetricians should be aware of this potentially fatal condition, a circumstance amply illustrated by the first two cases described above.

DIAGNOSIS

A primary abdominal pregnancy presents in the first trimester in much the same fashion as an ectopic pregnancy. An advanced secondary abdominal pregnancy, on the other hand, is much more difficult to diagnose. Presenting complaints may include abdominal pain (ranging from mild discomfort to unbearable pain), painful or absent fetal movements, nausea, vomiting, abdominal fullness, flatulence, diarrhea and general malaise. On examination, there may be an abnormal lie (15–20% of cases), easily palpable fetal parts, a closed uneffaced cervix on vaginal examination, and the failure to stimulate contractions with oxytocin or prostaglandins on attempting an induction of labor[3]. Obviously, these symptoms and circumstances are far from specific. Taken together, however, they may (and should) raise a question about the location of the pregnancy. On reviewing the laboratory findings, one may also find an unexplained transient anemia in early pregnancy corresponding to the time of tubal rupture or abortion. The serum α-fetoprotein value may be abnormally elevated without explanation. Early diagnosis has been described in response to evaluation of abnormal biochemical screening results[4].

The diagnosis can be established with far greater certainty by imaging studies. Ultrasound is ubiquitously used in pregnancy, but it does not always provide an unequivocal diagnosis. Even under ideal conditions, the diagnosis is missed on ultrasound in more than half of

cases[3]. Akhan and colleagues[5] report the following criteria suggestive of abdominal pregnancy:

(1) Visualization of the fetus separate from the uterus;

(2) Failure to visualize the uterine wall between the fetus and the maternal urinary bladder;

(3) Close approximation of fetal parts to the maternal abdominal wall;

(4) Eccentric position (relation of fetus to uterus) or abnormal fetal attitude (relation of fetal parts to one another) and visualization of extrauterine placental tissue.

In the past, radiography was commonly used to establish or at least point to this diagnosis. Features such as absence of uterine shadow around the fetus, maternal intestinal shadow intermingling with fetal parts on anteroposterior view, and overlapping of the maternal spine by fetal small parts in a lateral view were all described. Today, however, radiography is largely supplanted by magnetic resonance imaging and computed tomography. Both these techniques, with their ability to produce images in different planes, have much greater accuracy and specificity than ultrasound. There is little to choose between the two imaging modalities in cases of fetal demise. If the fetus is alive, magnetic resonance imaging may be preferable since ionizing radiations are avoided.

TIMING OF INTERVENTION

Maternal mortality is about 7.7 times higher with an abdominal pregnancy as compared to a tubal ectopic pregnancy and 90 times higher as compared to an intrauterine pregnancy[1]. These risks are thought to be chiefly related to the delay in diagnosis and mismanagement of the placenta. To minimize the risk from sudden, life-threatening intra-abdominal bleeding, it seems prudent to time intervention as soon as feasible after the diagnosis is confirmed. There is no controversy if there is maternal hemodynamic instability, the fetus is dead or pre-viable (less than 24 weeks pregnancy), has oligohydramnios or gross abnormalities on ultrasound. The hypothesis that fetal death will bring about placental involution and hence

reduced bleeding at laparotomy is not substantiated. Surgical intervention is mandated if any of the above conditions are present.

Some clinicians argue that, if there is an ongoing abdominal pregnancy greater than 24 weeks, a conservative approach should be taken to allow fetal maturity and improve chances of survival[6]. However, even after 30 weeks, fetal survival is only 63%, and 20% of fetuses have deformations (craniofacial and various joint abnormalities) and malformations (central nervous system and limb deficiencies)[7]. With advancing gestation, one also has to contend with the growing placenta and greater risk of bleeding. In our opinion, it would very rarely be justified to manage an abdominal pregnancy conservatively.

PREOPERATIVE PREPARATIONS

The major risk with surgery is torrential hemorrhage. When a diagnosis of abdominal pregnancy is established in advance, the opportunity to be prepared should not be lost. At least six units of blood should be cross-matched and read to transfuse in the operating room, and other blood products should also be available. Two intravenous infusion systems capable of delivering large volumes of fluids rapidly should be established. A mechanical bowel preparation should be affected if time permits. A MAST (medical antishock garment) suit has been utilized successfully in controlling intractable hemorrhage with an abdominal pregnancy[8], but these garments are not always available (see Chapter 14 for a full discussion). Kerr and colleagues[9] have advocated preoperative transfemoral catheterization and embolization of selective vessels before surgical intervention. This intervention was used successfully in three cases and the catheters can be left in place for their potential help in treating postoperative bleeding as well. The operating team should be an experienced one, and preferably should include a general, vascular and genitourinary surgeon. The anesthesia team should be comprised of senior consultants and their assistants. The operating room and nursing staffs should be fully aware of the nature of the diagnosis and its implications and schedule extra personnel in the room and as 'runners'.

SURGICAL APPROACH

A mid-line vertical approach is preferential, as it can easily be extended above the umbilicus if necessary. The amniotic sac may be adherent to the abdominal wall and viscera. It should be dissected free and opened in an avascular area away from the placenta. The fetus should be removed in such a manner as to minimize placental manipulation and avoid bleeding. If the pregnancy has been retained for a long period after fetal death, the fetus will have undergone suppuration. Bacterial contamination and abscess formation are highly likely, especially if the placenta is adherent to the intestines. There may be frank pus upon entering the peritoneal cavity. Rarely, the fetus may be mummified and calcified into a lithopedion or become converted into a yellow greasy mass called adipocere formation.

MANAGEMENT OF THE PLACENTA

The torrential hemorrhage that often ensues with surgery for abdominal pregnancy is related to the lack of constriction of the hypertrophied opened blood vessels after placental separation. Usually, the placenta is firmly attached to the parietal peritoneum, mesentery and bowel and *there is no bleeding if it is left alone*. The umbilical cord should be ligated close to the placenta, excess membranes trimmed away and the abdomen closed with drainage. Only very rarely is the placental implantation limited to the reproductive organs by a single pedicle, so that it can be easily removed[10].

In some instances, the placenta may separate spontaneously, simulating an abruption, but the situation in which hemorrhage becomes uncontrollable is more likely to arise from failed attempts at placental removal. Some clinicians advocate routine placental removal[3,8], but these papers were written before the obstetrics community appreciated the value of methotrexate in such instances. Placental separation requires complete ligation of the blood vessels supplying the placenta and manipulating it at its insertion. More importantly, placental separation is not always straightforward and fails in 40% of cases[3]. This is where the blood supply cannot be completely ligated, resulting in massive hemorrhage and shock[2]. The hemorrhage from the placenta is now torrential and rapid surgical action is essential. Various local techniques such as compression of the bleeding site, ligating the vascular pedicles, lavage with cold saline, and local and/or systemic coagulation promoting agents (tranexamic acid, plasminogen derivatives, absorbable gelatin sponge, etc.) have been described. Repair of placental lacerations may be required. The removal of the organ to which the placenta is adherent (hysterectomy and/or salpingoophorectomy, resection of the bowel and/or bladder) may be justified to control the hemorrhage. If a hysterectomy has been performed and bleeding continues, a Logothetopoulos pack brought out through the vaginal cuff can be used to exert pressure on the pelvic side-walls and bleeding vessels (see Chapter 33 for complete details). As a last resort, the abdomen may be packed tight with abdominal sponges and closed partially. The packs can be removed 48 h postoperatively or sooner if directed by hemodynamic instability.

POSTOPERATIVE CARE

Even when the placenta is left *in situ*, complications such as infection, abscesses, bowel obstruction secondary to adhesions or wound dehiscence occur in about one-half of the patients[11,12]. Although the problems associated with an abdominally retained placenta may be distressing and lead to subsequent repeat laparotomy, they are potentially less disastrous than an ill-advised attempt at removing the placenta. Prophylactic antibiotics should be administered so as to cover a substantial part of the postoperative course. Less common complications of the retained placenta include reversible maternal hydronephrosis[13] and prolonged persistent postpartum pre-eclampsia[14].

To hasten placental resorption, methotrexate as a single dose of 50 mg/m^2 can be used. This too is not without its specific problems, however. In a series of ten cases, accelerated placental destruction led to accumulation of necrotic tissue and abscess formation[15]. It is difficult to attribute this to methotrexate therapy alone, as these complications arise even without administration of methotrexate.

The patient with a retained placenta is monitored with clinical evaluation, ultrasound, color Doppler and serum β-hCG levels. Hormonal parameters drop rapidly in the postoperative period as most live cells will be destroyed early. The physical mass of the placenta is resorbed slowly over an average period of 6 months. A resorption period of 5 years has been reported[16], although this is highly unusual.

CONCLUSION

Secondary abdominal pregnancy is an uncommon and exceedingly dangerous variant of ectopic pregnancy. It is usually not diagnosed until laparotomy which leaves the obstetrician little preparation to face the prospect of torrential postpartum hemorrhage, albeit not from the usual sources. In this situation, minimizing placental handling and leaving it in the abdominal cavity can be life-saving.

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