

Recurrent uterine rupture diagnosed by ultrasound

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ABSTRACT

A case of recurrent rupture of the uterus is presented. The patient had a history of left cornual uterine rupture, which was repaired, and she was considered to be suitable for a subsequent pregnancy. During the subsequent pregnancy, attempts were made to evaluate the condition of the uterine scar by ultrasound in order to anticipate threatening rupture of the scar. No signs of dehiscence could be detected until the patient presented with clinical signs. Ultrasound examination revealed protrusion of the membranes at the fundus uteri.

Uterine rupture is a rare, but hazardous, obstetric complication that can affect both mother and child. The possible role of ultrasound in cases of elevated risk for uterine rupture is discussed.

INTRODUCTION

Rupture of the gravid uterus is a dangerous event for both mother and child. The occurrence is considered to be a major cause of maternal and fetal mortality in obstetric practice. Maternal mortality rates up to 41.6% and 9.7% have been reported for developing and developed countries, respectively^{1–4}. Fetal mortality rates vary between 10.3%, if uterine rupture is followed by immediate surgical intervention, and 100%⁵. Hemorrhage from the wound surface is the principal complication. Mortality rates, therefore, strongly depend on the time elapsed between onset and diagnosis of the uterine rupture, and on the possibility of immediate surgical intervention. Prompt diagnosis of the uterine rupture is of prime importance.

CASE REPORT

A woman, gravida 6, para 3, of 34 years of age, was booked at the obstetric outpatients' department for prenatal care. The patient's obstetric history revealed that she had had an ectopic pregnancy in the left Fallopian tube, treated by salpingotomy in 1981. In 1983

and 1989 she gave birth to a healthy girl and boy, respectively. In 1990 she had a second ectopic pregnancy in the left Fallopian tube, and salpingectomy was performed at 9 weeks' gestation. In 1991, in her fifth pregnancy, she was admitted by her midwife for evaluation of abdominal pain at 29 weeks of gestation. On arrival she complained of severe generalized abdominal pain, which referred to the right shoulder. Her blood pressure was 100/60 mmHg and pulse rate, 100 beats/min. Signs of severe fetal distress were present (fetal heart rate 80 beats/min) and a Cesarean section was performed immediately. At laparotomy the abdominal cavity contained approximately 2000 ml of free blood, originating from a left uterine cornual rupture. The rupture measured about 4–5 cm, and placental tissue protruded through it. A male infant, weighing 1500 g, was born with an umbilical artery pH of 6.85. Immediate resuscitation of the infant was unsuccessful. In order to preserve the child-bearing potential of the mother, the cornual rupture was repaired by approximating the edges of the rupture with interrupted sutures in two layers. The total amount of blood loss before and during the procedure was approximately 2500 ml.

In her present pregnancy the patient visited the outpatients' department of the Free University Hospital for the first time at 8 weeks' menstrual age. Ultrasound examination revealed an intrauterine pregnancy. The crown–rump length measured 1.8 cm, corresponding with the menstrual age. Ultrasound examination was performed every 2 weeks from 14 weeks, in order to detect possible changes in the left cornual scar region. The placenta was inserted at the lower left lateral side of the uterus, with the scar region left free. The patient was instructed to consult the outpatients' department for any, even slight, abdominal pain or any other discomfort. Furthermore, admittance into the hospital at 28 weeks was planned.

At 28 weeks, just prior to admittance, the patient consulted the outpatients' department and reported the

presence of a vague abdominal pain following sneezing a few hours earlier. The blood pressure measured 135/85 mmHg and the pulse rate, 115 beats/min. On palpation of the abdomen, a slight tenderness in the epigastric region was found. Considering her history and her present complaint, rupture of the uterus was included as one of the primary possibilities in the differential diagnosis. Ultrasound examination was performed immediately and revealed a reduced amount of amniotic fluid in the uterine cavity, and a viable fetus in cephalic presentation. Near the fundal region, there was discontinuity of the uterine wall. The amniotic sac, containing a fetal knee and most of the amniotic fluid, appeared to be protruding from the fundus of the uterus (Figure 1). A laparotomy was performed immediately. The abdominal cavity contained about 100 ml of free blood in the pouch of Douglas. A 10-cm large rupture in the fundal region was detected. The fetal trunk and extremities were positioned in the abdominal cavity enclosed by intact membranes. Only the fetal head and the placenta had remained in the uterine cavity. The amniotic membranes were incised and the infant was passed through the uterine rupture. A boy, weighing 1600 g with Apgar scores of 9 and 10 after 1 and 5 min, respectively, was born. After removal of the placenta, inspection revealed a large transparent avascular part of the uterine wall left lateral to the rupture. Only the serosal layer was still intact. A supravaginal hysterectomy was performed. The total blood loss was approximately 800 ml. After 9 days, the mother was discharged from the hospital in good condition. Her son was discharged after 29 days and is doing well.

DISCUSSION

In the past, when a salpingectomy was performed because of tubal pregnancy, cornual resection was the course of action to prevent recurrence of ectopic pregnancy in the tubal stump. It is now considered unnecessary and even harmful, because of the risk of uterine rupture in a subsequent pregnancy⁵. In this case, cornual

resection was the most likely cause of the left cornual rupture in the fourth pregnancy.

The incidence of uterine rupture ranges from 1 in 100 to 1 in 11 000 deliveries⁶. In The Netherlands, the incidence is estimated to be 2 or 3 in 10 000 deliveries⁴. Uterine rupture can have a traumatic origin, e.g. manipulation, violence, car accidents, or it can occur spontaneously. Spontaneous rupture has been reported in the presence of intrauterine infection, adenomyosis, placenta increta/percreta, previous amniocentesis, cephalopelvic disproportion or uterine anomalies^{2,6,7}. These are, however, very uncommon causes in developed countries, where rupture is virtually only ever seen in cases with a scarred uterus.

The likelihood that a uterine scar will rupture during a subsequent pregnancy depends strongly on its location⁸. The overall risk of rupture of corporal scars varies from 4 to 19%³. Comparing the lower uterine segment and corporal scars, the latter rupture more easily, tend to rupture prior to the onset of labor and represent a more serious complication^{4,8,9}.

A complete rupture, leading to direct communication with the abdominal cavity, is often accompanied by extensive bleeding and ruptured membranes. Symptoms of abdominal pain, vaginal bleeding, sudden onset of uterine contractions, cardiotocographic signs of fetal distress, hypotension or hematuria may be absent or unclear^{2,6,10}. This inconsistency makes the diagnosis of this dangerous event very difficult. As is demonstrated in this report, ultrasound can be very helpful in the diagnostic process.

The first attempts to evaluate whether a uterine scar was intact were made in 1955 using hystero-graphy¹¹. With the introduction of ultrasound in obstetric practice, several studies were performed to evaluate the integrity of a uterine scar during pregnancy. Transvaginal ultrasound was found to be particularly helpful for the determination of the actual thickness of a transverse lower segment scar. However, ultrasound evaluation of a corporal scar appeared to be of limited value^{12,17}. In the case presented, ultrasound evaluation of the cornual

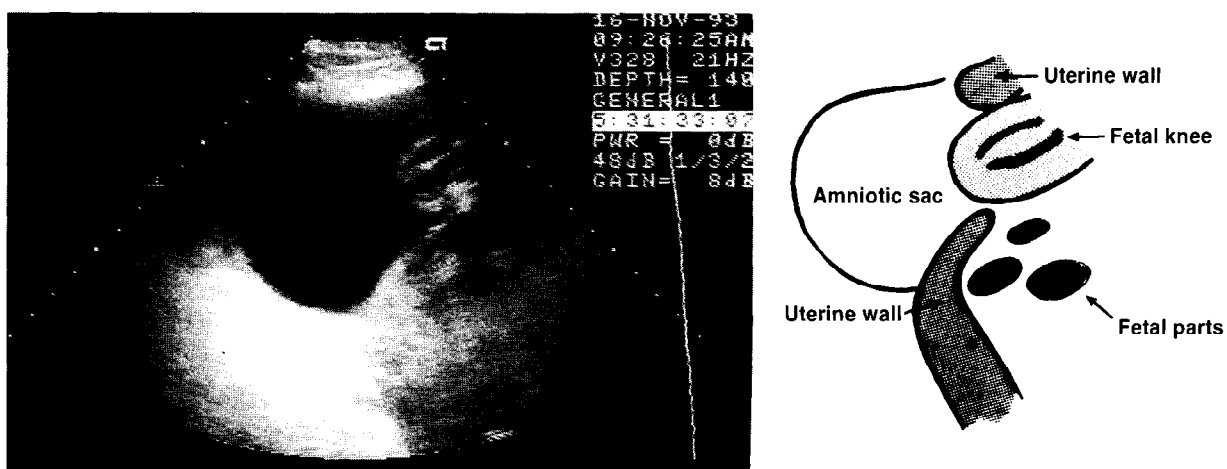


Figure 1 View of the rupture of the gravid uterus. The discontinuity of the uterine wall is visualized with the fetal knee and amniotic sac protruding through the rupture

region did not reveal probable local dehiscence, fenestration or decreasing thickness of the uterine wall. The critical integrity of this scar only became evident when rupture was complete and the membranes, containing fetal parts, protruded through the fenestrated uterine wall.

Since clinical presentation can be very inconsistent, any complaint or symptom that may indicate rupture of a uterine scar should be taken seriously. If a uterine rupture is considered, one should remember that absence of the 'classical' symptoms does not exclude this hazardous event^{1,4,6,7}. This case report demonstrates the value of ultrasound in a case of suspected uterine rupture.

REFERENCES

- Megafu, U. (1985). Factors influencing maternal survival in ruptured uterus. *Int. J. Gynaecol. Obstet.*, **23**, 475–80
- Golan, A., Sandbank, O. and Rubin, A. (1980). Rupture of the pregnant uterus. *Obstet. Gynecol.*, **56**, 549–54
- Spaulding, L. B. and Gallup, D. G. (1979). Current concepts of management of rupture of the gravid uterus. *Obstet. Gynecol.*, **54**, 437–41
- Vandenbussche, F. P. H. A., Gaarenstroom, K. N. and Kanhai, H. H. H. (1993). Ruptuur van de zwangere uterus. *Ned. Tijdschr. Geneesk.*, **137**, 2569–73
- Weissman, A. and Fishman, A. (1992). Uterine rupture following conservative surgery for interstitial pregnancy. *Eur. J. Obstet. Gynecol. Reprod. Biol.*, **44**, 237–9
- Schrinsky, D. C. and Benson, R. C. (1978). Rupture of the pregnant uterus: a review. *Obstet. Gynecol. Surv.*, **33**, 217–32
- Felmus, L. B., Pedowitz, P. and Nassberg, S. (1953). Spontaneous rupture of the apparently normal uterus during pregnancy: a review. *Obstet. Gynecol. Surv.*, **8**, 155–71
- Enkin, M. (1989). Labour and delivery following previous caesarean section. In Chalmers, I., Enkin, M. and Keirse, M. J. N. C. (eds.) *Effective Care in Pregnancy and Childbirth*, pp. 1196–215. (New York: Oxford University Press)
- Voogd, L. B., Wood, H. B. and Powell, D. V. (1956). Ruptured uterus. *Obstet. Gynecol.*, **7**, 70–5
- Rachagan, S. P., Raman, S., Balasundram, G. and Balakrishnan, S. (1991). Rupture of the pregnant uterus – a 21-year review. *Aust. NZ J. Obstet. Gynaecol.*, **31**, 37–40
- Baker, K. (1955). Vaginal delivery after lower segment caesarean section. *Surg. Gynecol. Obstet.*, **100**, 690–6
- Fukuda, M., Shimizu, T., Ihara, Y., Fukuda, K., Natsuyama, E. and Mochizuki, M. (1990). Ultrasound examination of caesarean section scars during pregnancy. *Arch. Gynecol. Obstet.*, **248**, 129–38
- Fukuda, M., Fukuda, K. and Mochizuki, M. (1988). Examination of previous caesarean section scars by ultrasound. *Arch. Gynecol. Obstet.*, **243**, 221–4
- Michaels, W. H., Thompson, H. O., Boutt, A., Schreiber, F. R., Michaels, S. L. and Karo, J. (1988). Ultrasound diagnosis of defects in the scarred lower uterine segment during pregnancy. *Obstet. Gynecol.*, **71**, 112–20
- Vaclavinkova, V. and Westin, B. (1984). Ultrasonic diagnostics of defective scars following caesarean section. *Zentralbl. Gynakol.*, **106**, 686–92
- Chen, H., Chen, S. and Hsieh, F. (1990). Observation of cesarean section scar by transvaginal ultrasonography. *Ultrasound Med. Biol.*, **16**, 443–7
- Lonky, N. M., Worthen, N. and Ross, M. G. (1989). Prediction of cesarean section scars with ultrasound imaging during pregnancy. *J. Ultrasound. Med.*, **8**, 15–19