Unusual presentation of more common disease/injury

Spontaneous uterine rupture at 22 weeks' gestation in a multipara with previous hysteroscopic resection of fibroid

Gurbaksh Badial,¹ Paula J Fagan,² Mohammad Masood,³ Seema Chakravarti³¹Obstetrics and Gynaecology Department, Whipps Cross Hospital, London, UK;²Department of Medical Oncology, St Bartholomew's Hospital, London, UK;³Obstetrics and Gynaecology Department, Queen's Hospital, Romford, UK**Correspondence to** Dr Gurbaksh Badial, g.badial@doctors.org.uk**Summary**

A 34-year-old multiparous woman presented at 22⁺⁶ weeks' gestation with severe abdominal pain which preceded a mechanical fall down the stairs. On admission, fetal movements were felt and fetal heart rate was detected by Doppler ultrasound. Over the course of 12 h, although she maintained her vital signs, repeat laboratory and radiological investigations suggested sinister intra-abdominal pathology. Subsequently, fetal movements and heart rate ceased and the patient began to decompensate. A CT scan confirmed uterine rupture. Subsequent emergency laparotomy revealed a 2 l haemoperitoneum and lifeless fetoplacental unit in the abdominal cavity. It is postulated that this rupture occurred as a rare yet life-threatening complication of a hysteroscopic resection of fibroid that the patient underwent 1 year previously. There are no known published cases of a spontaneous uterine rupture following a hysteroscopic procedure at such an early gestation. The patient made a full physical recovery.

BACKGROUND

Uterine rupture is known to cause significant maternal and fetal morbidity and mortality. The most recent Centre for Maternal and Child Enquiries report highlighted one maternal death resulting from haemorrhage secondary to a ruptured uterus, and estimates an incidence of uterine rupture of 17.4 per 100 000 maternities.¹ Uterine rupture has been shown to occur in labour (whether preterm or at term) or spontaneously.^{2 3}

Cases of rupture are more likely to occur in a scarred uterus, most commonly after a previous caesarean delivery or open myomectomy.⁴ It has been previously postulated that operative hysteroscopy for a congenital abnormality such as hysteroscopic metroplasty may increase the risk of uterine rupture in subsequent pregnancies, with the relatively simpler procedure of resection of a submucous fibroid having no adverse obstetric outcome.⁵ Although there are numerous reports of rupture occurring after laparoscopic myomectomy, it has rarely been reported after operative hysteroscopy, a report of which follows.^{3 6 7}

A 34-year-old administrative clerk who is gravida 3 para 2, with a body mass index of 24.8 was presented. Aside from occasional migraine headaches, she is otherwise fit and well. She has no known allergies and is a non-smoker. Her first pregnancy in 2005 resulted in a spontaneous vaginal delivery at 38 weeks' gestation of a healthy 3.3 kg baby. During that pregnancy, she was diagnosed with gestational diabetes mellitus requiring insulin.

In early 2010, she underwent an uncomplicated transcervical resection of a fundal fibroid. This was performed as a day-case procedure and she was discharged the same day. However, she was readmitted with abdominal pain and subsequent CT imaging of her pelvis revealed an area of linear hypodensity bridging the deep myometrial wall

of her uterus. There was no clear evidence of perforation of the uterus. She was managed conservatively and discharged the following day.

Her second pregnancy was later in 2010 and, similar to her first, she was diagnosed with gestational diabetes mellitus, this time requiring both metformin and insulin. At 33 weeks' gestation she presented with reduced fetal movements and subsequently an intrauterine fetal death was confirmed. After induction of labour, she underwent a difficult delivery complicated by shoulder dystocia. The fetus weighed 2.4 kg. Postmortem examination revealed a large baby (90th centile) with hyperglycaemia. Furthermore, there was evidence of posterior placental thrombosis suggesting abruption. Postnatal thrombophilia and antiphospholipid screens were negative. A postnatal oral glucose tolerance test revealed fasting blood glucose of 7 mmol/l, and at 2 h, 5.9 mmol/l.

She presented in her third pregnancy at 7 weeks' gestation. Booking laboratory investigations were within accepted normal ranges. At booking, she was started on prophylactic enoxaparin 40 mg and aspirin 75 mg daily. A glucose tolerance test at 8 weeks' gestation revealed impaired glucose tolerance: fasting blood glucose was 6.8 mmol/l, and at 2 h, 8.5 mmol/l. She was prescribed metformin and insulin for the duration of her pregnancy.

Table 1 Relevant blood results on admission (T₀), at T_{2h} and T_{8h}

	Admission	T ₂	T ₈
Hb (g/dl)	11.5	9.7	8.6
WCC ($\times 10^9/l$)	10.1	18.1	18.9
Neutrophils ($\times 10^9/l$)	6.9	15.8	17.9
Platelets ($\times 10^9/l$)	270	240	187
HCT	0.34	0.29	0.25

Hb, haemoglobin; HCT, haematocrit; WCC, white cell count.

Table 2 Arterial blood gas results on 4 l O₂

pH	7.369
P _a O ₂	33.17
P _a CO ₂	3.49
HCO ₃	14.3
BE	−9.4
Lactate	0.58

BE, base excess.

Figure 1 CT scan of abdomen and pelvis illustrating suspected uterine rupture with fetus in the abdominal cavity and fluid in the abdomen.

CASE PRESENTATION

A 34-year-old woman presented at 22⁺⁶ weeks' gestation with a history of sudden onset severe abdominal pain followed by a mechanical fall down her stairs. Her abdominal pain preceded the fall and worsened after. On admission, the pain had settled to a mild suprapubic ache. There was no blood loss per vaginum and fetal movements were felt.

INVESTIGATIONS

Her pulse rate on admission was 64 bpm, blood pressure 92/54 (repeat: 105/54) and oxygen saturations were 97% on air. Bedside glucometer reading was above 9 mmol/l on two occasions. Serial laboratory investigations were done and relevant parameters are outlined in table 1. Renal and liver function, clotting screen, adjusted calcium and phosphate levels were unremarkable. Within 2 h of admission, she suffered an episode of loss of consciousness that lasted approximately 1 min. Her pulse rate was 65 bpm, blood pressure ranged from 92–123/45–63 mm Hg. Her temperature was 36.4°C, and a glucometer reading was 9.6 mmol/l. Large bore intravenous access was established, repeat blood sampling was done (table 1) and intravenous normal saline was commenced. Intramuscular pethidine was administered with some effect but she had now started vomiting intermittently. In view of her drop in haemoglobin, a repeat blood sample was taken 6 h later (table 1). Urine dipstick testing revealed the presence of leucocytes, protein, ketones and glucose. At 8 h postadmission, her pulse rate was 80 bpm and blood pressure was 100/60 mm Hg. Repeat abdominal examination found the uterus to be soft with generalised but no focal

Figure 2 Digital photograph of multiparous uterus showing fundal rupture at 22⁺⁶ weeks' gestation.

tenderness. Arterial blood gas results on 4 l oxygen therapy are outlined in table 2.

DIFFERENTIAL DIAGNOSIS AND FURTHER INVESTIGATIONS

The patient was admitted on a weekend; therefore departmental ultrasound scanning for fetal viability was not available. Instead, repeated bedside ultrasound was performed which detected fetal heart activity until 20h00. In view of her drop in haemoglobin, the general surgical team was asked to review the patient to exclude intra-abdominal haemorrhage secondary to trauma. Meanwhile, as a result of her significant neutrophilia and urine dipstick findings, a provisional diagnosis of urinary tract infection was made and she was started on intravenous co-amoxiclav. However, her pain was noted to be out of proportion with what might be expected from that of a urinary tract infection.

The patient's pain persisted, and at 11 h postadmission her pulse began to rise to 101 bpm with a blood pressure of 135/85 mm Hg. After input from the surgical and radiological teams and discussion with the patient and her husband about the risks and benefits, a CT scan of her abdomen and pelvis was performed to aid diagnosis (figure 1). The consultant radiologist advised that CT would be of better diagnostic value rather than MRI or ultrasound in identifying causes of intra-abdominal haemorrhage. A verbal report from the consultant radiologist revealed suspected uterine rupture with fetus in the abdominal cavity and either blood or ascites in the abdomen.

Further repeat laboratory investigations at approximately 12 h postadmission revealed a Hb of 7.9 g/dl. Serum lactate

Figure 3 Digital photograph of multiparous uterus with repaired fundal rupture.

dehydrogenase was within normal range. By this time, fetal movements had ceased and repeat ultrasound of her abdomen suggested no fetal heart activity. The patient was thus consented for laparotomy +/- uterine repair +/- hysterectomy for a joint procedure with the general surgical team.

TREATMENT

In the emergency theatre, a low vertical incision was made and a two litre haemoperitoneum was found. The lifeless fetoplacental unit was lying intact free in the abdominal cavity. A rupture was seen at the uterine fundus measuring approximately 6 cm in length with a clear defect penetrating through all layers of the uterus (figure 2). The uterine cavity was otherwise empty. The defect was sutured in three layers with No.1 Vicryl (figure 3). Complete examination of the abdominal viscera revealed no other source of bleeding or trauma. The patient was transfused five units of blood and two pools of fresh frozen plasma intraoperatively.

The patient was admitted to the intensive care unit overnight for monitoring purposes. She was extubated in the immediate postoperative period and spent one further day in the high dependency unit. She made a steady physical recovery and was eventually discharged after a total length of hospital stay of 7 days.

OUTCOME AND FOLLOW-UP

Since the patient's obstetric risk factors include a 33 week intrauterine death, a 22 week uterine rupture and gestational diabetes, she was counselled against future pregnancies when she presented for outpatient postoperative follow-up. She was physically well at follow-up. Access to emotional and psychological support was provided, and alternative options such as adoption and surrogacy were discussed.

DISCUSSION

A review of 14 case reports of uterine rupture in pregnancy following operative hysteroscopy revealed one case after

resection of a submucous fibroid.⁸ In this particular case, the patient had a spontaneous uterine rupture at 33 weeks' gestation.⁹ The history involved hysteroscopic resection of a fibroid with uterine perforation noted at the time of resection. This led to a laparotomy to repair the defect. Therefore, this case may be considered akin to any open procedure that may scar the uterus, such as caesarean section or open myomectomy.

A recent review of surgical techniques for hysteroscopic myomectomy cited two cases of uterine rupture in pregnancy following hysteroscopic resection of a fibroid.¹⁰ The first is described above.⁸ The second case describes uterine rupture in pregnancy but does not clarify the gestation at which it occurred or whether it was spontaneous or in labour.¹¹ Therefore, to the authors' knowledge there is no other published report on the incidence of a spontaneous uterine rupture at such an early gestation following transcervical hysteroscopic resection of fibroid.

The dramatic turn of events described above raises the question of long-term safety of hysteroscopic myomectomy. We believe that all women undergoing this perceived safe procedure should be counselled about the rare but devastating complication of uterine rupture in pregnancy.

This case also illustrates how the physical reserve of a young healthy woman may mask serious intra-abdominal pathology until she begins to decompensate, which is inevitably a late sign. Early multi-disciplinary input from general surgeons, radiologists and general physicians is essential to reach a conclusive diagnosis. A high index of suspicion and thorough, repeated clinical examination and laboratory investigations are necessary to allow timely intervention and to prevent serious maternal morbidity and mortality.

Learning points

- ▶ Consider counselling women undergoing hysteroscopic myomectomy about the rare but serious complication of uterine rupture in pregnancy.
- ▶ The physical reserve of young healthy patients may mask serious underlying pathology until they decompensate, which is inevitably a late sign.
- ▶ Repeated clinical examination and serial laboratory investigations aid timely intervention and may prevent serious maternal and perinatal morbidity and mortality.
- ▶ When a symptom (such as pain) appears out of proportion to the differential diagnosis, enlist multi-disciplinary input to assist in reaching a conclusive diagnosis.

Competing interests None.

Patient consent Obtained.

REFERENCES

1. Centre for Maternal and Child Enquiries (CMACE). Saving Mothers' Lives: reviewing maternal deaths to make motherhood safer: 2006–08. The Eighth Report on Confidential Enquiries into Maternal Deaths in the United Kingdom. *BJOG* 2011;**118**(Suppl.1):1–203.
2. Angell NF, Tan Domingo J, Siddiqi N. Uterine rupture at term after uncomplicated hysteroscopic metroplasty. *Obstet Gynecol* 2002;**100**(5 Pt 2):1098–9.

3. **Hockstein S.** Spontaneous uterine rupture in the early third trimester after laparoscopically assisted myomectomy. A case report. *J Reprod Med* 2000;**45**:139–41.
4. **Edmonds DK.** *Dewhurst's Textbook of Obstetrics and Gynaecology*. Seventh Edition. Oxford, UK: Blackwell Publishing 2007.
5. **Sentilhes L, Sergent F, Berthier A, et al.** Uterine rupture following operative hysteroscopy. *Gynecol Obstet Fertil* 2006;**34**:1064–70.
6. **Parker WH, Einarsson J, Istre O, et al.** Risk factors for uterine rupture after laparoscopic myomectomy. *J Minim Invasive Gynecol* 2010;**17**:551–4.
7. **Banas T, Klimek M, Fugiel A, et al.** Spontaneous uterine rupture at 35 weeks' gestation, 3 years after laparoscopic myomectomy, without signs of fetal distress. *J Obstet Gynaecol Res* 2005;**31**:527–30.
8. **Sentilhes L, Sergent F, Roman H, et al.** Late complications of operative hysteroscopy: predicting patients at risk of uterine rupture during subsequent pregnancy. *Eur J Obstet Gynecol Reprod Biol* 2005;**120**:134–8.
9. **Yaron Y, Shenhav M, Jaffa AJ, et al.** Uterine rupture at 33 weeks' gestation subsequent to hysteroscopic uterine perforation. *Am J Obstet Gynecol* 1994;**170**:786–7.
10. **Di Spiezio Sardo A, Mazzon I, Bramante S, et al.** Hysteroscopic myomectomy: a comprehensive review of surgical techniques. *Hum Reprod Update* 2008;**14**:101–19.
11. **Derman SG, Rehnstrom J, Neuwirth RS.** The long-term effectiveness of hysteroscopic treatment of menorrhagia and leiomyomas. *Obstet Gynecol* 1991;**77**:591–4.

This pdf has been created automatically from the final edited text and images.

Copyright 2012 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Please cite this article as follows (you will need to access the article online to obtain the date of publication).

Badial G, Fagan PJ, Masood M, Chakravarti S. Spontaneous uterine rupture at 22 weeks' gestation in a multipara with previous hysteroscopic resection of fibroid. *BMJ Case Reports* 2012;10.1136/bcr.11.2011.5129, Published XXX

Become a Fellow of BMJ Case Reports today and you can:

- Submit as many cases as you like
- Enjoy fast sympathetic peer review and rapid publication of accepted articles
- Access all the published articles
- Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow