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## CASE REPORTS

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# Term delivery after intrauterine relocation of an ectopic pregnancy

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### Case report

A 29 year old African woman presented for ultrasound examination at just over five weeks of amenorrhoea. She was asymptomatic but had a past history of a right salpingectomy and a left salpingostomy for ectopic pregnancies. She had no children. Transvaginal ultrasound using a 5 MHz transducer showed an empty uterus with a marked decidual reaction and a left-sided ectopic pregnancy. The ectopic gestation sac with fetal heart pulsations was clearly visible. She was offered the possibility of an attempt at relocation of the ectopic pregnancy into her uterus. She readily accepted but was given 24 h for reflection and discussion with her family.

At laparotomy, a left-sided, unruptured, ampullary, ectopic gestation was confirmed. A linear salpingostomy was performed with a scalpel and the pregnancy was removed by means of a sharp curette. Whilst haemostasis was being secured and the wound closed, the ectopic pregnancy was placed in the uterus. The cervix was dilated to Hegar 10 and, using a small, sharp curette, a strip of decidua was removed from each of the four quadrants of the uterus. The curved end of a 9 mm Berkley uterine aspiration curette (Pennine Healthcare, UK) was trimmed away and the pregnancy was placed in the end. The curette was introduced into the uterus and the pregnancy dislodged by gently blowing down the other end. The patient underwent an ultrasound examination two days later when a singleton pregnancy with a crown-rump length of 4 mm and fetal heart activity was seen. The patient was discharged home on the fourth post-operative day.

Ultrasound examination at eight and 12 weeks gestation demonstrated normal growth. At the 18th week ultrasound examination, the fetus was symmetrically small with both head and abdominal circumference two standard deviations below the mean of the data reference range. Colour-coded, pulsed Doppler ultrasound examination of the uterine arteries demonstrated bilateral low resistance patterns without evidence of early diastolic notches. The fetus was structurally normal without markers suggestive of chromosomal anomaly.

Fetal biometry at 28, 32 and 36 weeks of gestation demonstrated normal growth velocity, albeit at the lower limits of the data reference range, and the pregnancy was otherwise uncomplicated. The woman was delivered of a healthy 2.7 kg female infant at 38 weeks after a six and a half hour labour of spontaneous onset. The third stage was actively managed and a 410 g placenta was delivered by controlled cord traction without difficulty. Neonatal examination was normal, and mother and baby were discharged home after 48 h.

### Discussion

The improved resolution of transvaginal ultrasound transducers, compared with transabdominal probes, now allows about 96% of ectopic pregnancies to be diagnosed (Rottem *et al.* 1991). Approximately 24% of ectopic pregnancies will have fetal heart activity at the time of diagnosis, and these form group 1a of the classification of Rottem *et al.* (1991). The 5 MHz transvaginal transducer clearly resolved the ectopic gestation and demonstrated fetal heart activity allowing the operator to know that the fetus was alive. The increased resolution of the transvaginal probe makes it unlikely that a co-existent intrauterine pregnancy will have been missed.

As far as we are aware, this is the first successful relocation via the cervical route. A literature search reveals two earlier reports: one successful relocation at 40 days of gestation by Shettles (1990) who also cites a further case described by C. J. Wallace in 1917. In the case described by Wallace, an ectopic pregnancy was discovered at the time of myomectomy, relocated in the uterus after the myomectomy was complete, and the woman was eventually delivered of a normal infant at term. In the later case, the diagnosis of an ectopic was suspected on clinical grounds and a 40 day gestation sac was relocated into the uterus via a glass tube pushed through the myometrium until decidua was obtained by gentle suction. The gestation sac was then expressed from a syringe down the glass tube into the uterus.

Prior to this case we had had eight unsuccessful attempts at five to eight weeks of gestation. In only one previous attempt we did succeed in detecting a fetal heart on the day after operation. In this case the cervix was difficult to dilate, and placement of the gestation sac was associated

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with marked uterine bleeding. The pregnancy miscarried two weeks after the procedure at nine weeks of amenorrhoea.

It is interesting to speculate as to the reason for success. Although trophoblast retains the capacity for invasion until about 20 weeks of gestation (Aplin 1991), the invasion that occurs at implantation is probably different from the more penetrative invasion into the stroma and decidual spiral arteries. In the former, invasion is by the syncytial trophoblast, occurs in a nondecidualised endometrium, and the invading cells must traverse the barrier posed by an intact epithelium with an underlying basement membrane. During the subsequent events of placentation, the syncytium is no longer invasive and further invasion is mediated by the cytotrophoblast. There is now no epithelium or basement membrane to overcome and the endometrium is decidualised.

The endometrial epithelium appears to be positively hostile to invasion except during the short-lived receptive phase—the so called window of implantation (Psychoyos 1986), and perhaps only a particular subpopulation of trophoblast is capable of invading this epithelium. This might explain our failures since we were expecting cytotrophoblast to invade a nonreceptive endometrial epithelium. Gentle curettage removed some of the hostile epithelium and allowed cytotrophoblast invasion. This theory is supported by the classical experiments of Kirby (1960, 1963a, b) in which murine blastocysts or ectoplacental cones were transplanted to ectopic or orthoptic sites. It was found that the extent and duration of trophoblast invasion was greater in extrauterine sites and nonpregnant uteri than in pseudo-pregnant or pregnant decidualised uteri. We also have found in our model of human trophoblast-decidual co-cultures (Manyonda & Choy 1994) that invasion only occurs in the absence of endometrial epithelium. In our one previous case in which fetal heart activity persisted over two weeks, there had been active bleeding at the time of placement and this may have resulted from epithelial damage which allowed a

degree of cytotrophoblast invasion. In the two previously reported cases relocation had been by incision or penetration of the myometrium to the decidua, both of which would damage the endometrial epithelium.

Thus the possibility of altering the epithelium to allow cytotrophoblast invasion, together with the fact that the intervillous circulation is not established until after eight weeks gestation, may allow success from intrauterine placement in selected cases before this gestation.

#### Acknowledgments

We freely admit that we stole the idea for uterine replacement of ectopic pregnancies from Professor J. G. Grudzinskas, who less freely admits that he stole it from Professor Ian Donald.

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## Carbon dioxide embolism following diagnostic hysteroscopy

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#### Case report

A previously healthy, 33 year old woman presented with a history of eight weeks of amenorrhoea, vaginal bleeding,

and bilateral iliac fossa pain. On examination she was afebrile and haemodynamically stable with mild abdominal tenderness and guarding. Vaginal examination revealed a bulky uterus with adnexal tenderness, but no mass was palpable. Investigations included a normal haemoglobin level of 14 g/dl, normal white cell count and a positive pregnancy test. An ultrasound scan showed no

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