CASE REPORT

Broad ligament twin pregnancy following in-vitro fertilization

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We report the first case of an ectopic twin pregnancy in the broad ligament following in-vitro fertilization and embryo transfer in a patient with a previous ipsilateral (left) salpingo-oophorectomy. The previous surgery was for endometriosis. We discuss the possible contribution of the embryo transfer technique, limitations of preventive measures and importance of transvaginal ultrasound in establishing the diagnosis.

Key words: broad ligament pregnancy/embryo transfer/in-vitro fertilization

Introduction

The incidence of ectopic pregnancy is significantly higher after assisted reproduction than in the general population. Of all clinical pregnancies that occur with in-vitro fertilization (IVF), 4.5% are likely to be ectopic (Maymon and Shulman, 1996). The majority of these are tubal ectopic pregnancies, although cornual (Agrawal et al., 1996), Ovarian (Marcus and Brinsden, 1993), primary abdominal pregnancies (Oehninger et al., 1988; Balmaceda et al., 1993; Moonan-Delarue and Hoest, 1996) and heterotopic abdominal pregnancies (Marcus et al., 1995) have been infrequently reported. We report the first case of an ectopic twin pregnancy in the broad ligament following IVF and embryo transfer in a patient with a previous ipsilateral (left) salpingo-oophorectomy.

Case report

A 33 year old, nulliparous—gravida 1, was referred for tertiary subfertility treatment to our unit. There was a 7 year history of secondary infertility following a previous pregnancy which was terminated in the first trimester in 1988. Endometriosis was diagnosed at a laparoscopy and hydrotubation performed in 1989. She subsequently received danazol therapy. In 1992 a left salpingo-oophorectomy was performed after the development of ovarian endometrioma. In 1993 a repeat laparoscopy and hydrotubation demonstrated a patent right Fallopian tube and in 1994 she had laparoscopic pelvic diathermy to remove endometriotic deposits.

She was referred to our unit in 1994 for assisted conception and after appropriate investigations and counselling underwent IVF. The long protocol regimen was used for pituitary down-regulation using GnRH analogue (Prostap SR® 3.75 mg s.c.; Wyeth Lab., Maidenhead, UK). Ovulation induction was undertaken using recombinant human follicle stimulating hormone (Gonal-F®; Serono UK Ltd, Welwyn Garden City, UK), 225 IU daily. Human chorionic gonadotrophin (HCG) (Profasi®; Serono UK Ltd, 10 000 IU) was given for oocyte maturation. Eight oocytes were recovered of which five fertilized normally. Transcervical embryo transfer was carried out on the third day following oocyte recovery. A Wallace catheter (Sim-care UK Ltd, Lancing, UK) was used for embryo transfer. The soft cathether could not be passed through the internal cervical os, therefore it was returned to the embryologist. The stiffer Wallace stylet was used to negotiate the internal os and was passed with ease. The stylet was removed and the soft inner Wallace catheter with embryos loaded was then threaded through the outer sheath of the Wallace cannula. Twenty microlitres of culture medium (Scandinavian IVF/50; Hunter Scientific, Essex, UK) was used and two embryos were transferred. The catheter was 6 cm into the uterine cavity from the external cervical os. The embryos were 41.5 h old and were at the 2-cell stage. The blastomeres were equal in size and shape with no fragmentation.

A pregnancy test was carried out on a urine sample on day 17 after HCG administration and was positive. Although it is standard practice in our unit to undertake the first ultrasound scan at 5 or 6 weeks’ gestation, this patient was unable to attend at the scheduled times. Therefore the patient attended for ultrasound examination 7 weeks from embryo transfer. The patient was asymptomatic. A decidual reaction was noted and a 60 cm mass was demonstrated on the left side of the uterus. This mass contained two fetuses with crown–rump lengths of 23 and 20 mm, with fetal heart rate of 180 and 190 b.p.m. (Figure 1). The lambda sign was demonstrated indicating that this was a dichorionic twin pregnancy (Sepulveda et al., 1996). No free fluid was noted in the Pouch of Douglas and the right ovary was normal. Diagnosis of an ectopic pregnancy was made and laparotomy was carried out 7 h later.

The abdomen was opened through the previous subumbilical vertical incision. A pregnancy in the left broad ligament was confirmed. The bowel was adherent to the posterior surface of the uterus, the left tube and ovary were absent. The right Fallopian tube was normal and deposits of endometriosis were noted on the right ovary.

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The pregnancy mass ruptured during exploration and the contents were removed. The implantation site was examined and once the pelvic side-wall structures were identified the area was closed with continuous and interrupted sutures. A suction drain was placed within the pelvis. Post-operatively the patient received prophylactic subcutaneous heparin and antibiotics. The possibility of a ureteric fistula was raised because of persistent haemoserous loss through the drain but intravenous pyelography was carried out and was reported as normal and the problem resolved. Serum β-HCG concentrations were followed up and the values were as follows: day of surgery, 55560 IU/l; 5th post-operative day, 1040 IU/l. A fortnight after the laparotomy HCG concentration was 67 IU/l and 5 weeks post-laparotomy HCG concentration was <6 IU/l. The histological examination of the specimen confirmed a twin pregnancy.

Discussion

Ectopic pregnancy is a potentially life-threatening condition and accounts for about 11.5% of all maternal deaths in the UK. Abdominal pregnancies account for only 1.4% of ectopic pregnancies (Fisch et al., 1996). However the incidence of abdominal and ovarian pregnancies is 3 to 8-fold higher following IVF/embryo transfer than in the general population.

Various surgical measures including bilateral tubal ligation, salpingectomy on the remaining side if the contralateral tube appears damaged (Raziel et al., 1997) and obstruction of the interstitial portion of the Fallopian tube using laser have been proposed as preventive measures against recurrent tubal pregnancy. This case demonstrates that unilateral salpingectomy (although performed for a different reason in this case) cannot prevent abdominal pregnancy.

Although patients with tubal disease are more at risk of developing ectopic pregnancy (Verhulst et al., 1993), Dubuisson et al. (Dubuisson, 1991) reported that the rate of ectopic pregnancy was 2.1% when the indication for IVF treatment was endometriosis, as present in this case.

A possible role of embryo transfer technique in the aetiology of ectopic pregnancy has been discussed by Azem et al. (1993) and by Nazari et al. (1993). They discuss the role of volume of culture media used for embryo transfer. Transfer of embryos in a small volume of culture media (10–20 μl) has been advised to prevent reflux into the Fallopian tube. It has also been proposed that transfer of embryos to a standard mid-cavity position results in a lower ectopic pregnancy rate. These measures were taken in the present case.

The other possible reasons for the ectopic implanting on the side which did not have a Fallopian tube include perforation of the cervix or uterus at embryo transfer by the stylet, migration of the embryos from the uterus to the broad ligament via the contralateral Fallopian tube, and re-canalization of the stump of Fallopian tube at the junction of the isthmus and cornua.

In our case the Wallace catheter could not be passed with ease and a cannula with an inner metal stylet had to be used. It is possible that the stylet perforated the uterus and embryos were transferred into the broad ligament inadvertently.

Early diagnosis can prevent rupture of the ectopic pregnancy which leads to haemoperitoneum and circulatory collapse. One distinguishing feature of this case is that the patient was asymptomatic and the diagnosis was made by transvaginal ultrasound scanning when the patient attended for routine ultrasound examination for confirmation of pregnancy. Combination of serum β-HCG and transvaginal ultrasound scanning are the two accepted methods for the diagnosis of ectopic pregnancy. In our case pre-operative serum HCG concentration was not considered to be a diagnostic aid; however, it was invaluable in the post-operative follow-up.

This case was not considered suitable for laparoscopic surgery because of the site and the size of the ectopic gestation and also because of previous abdominal surgery for endometriosis.

Fertility after an ectopic pregnancy always causes concern. Job-Spira et al. (Job-Spira et al., 1996) evaluated reproductive outcome after ectopic pregnancy from a population-based study. They reported the probability of obtaining an intrauterine pregnancy within 1 year of seeking a pregnancy to be 70%. Intrauterine pregnancy rate was 75% among women without prior tubal damage and 55% among those with prior tubal damage. Risk of recurrent ectopic pregnancy was found to be 9.8%. Major determinants of risk of recurrence were prior tubal damage and prior spontaneous abortion.

Although IVF/embryo transfer was developed to circumvent
tubal factor infertility, increasing numbers of unusual forms of ectopic pregnancies are being reported after IVF/embryo transfer treatment. An ectopic pregnancy in the upper retroperitoneum has been reported by Ferland et al. (Ferland et al., 1991). Approximately 1% of clinical pregnancies achieved after IVF/embryo transfer treatment are likely to be heterotopic (combined intra- and extraterine pregnancy). Demonstration of intrauterine gestation sac does not exclude an ectopic pregnancy in these cases.

This case highlights the importance of ultrasound scanning of all pregnancies that occur after IVF. Clinicians must have a high index of suspicion and should counsel the patients regarding the rate of ectopic pregnancy after assisted conception.

This patient has since had a further IVF/embryo transfer cycle and currently has an ongoing intrauterine singleton pregnancy.

References