Pregnancies from Fallopian replacement of immature eggs with delayed intrauterine insemination


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Gamete intrafallopian transfer requires that a woman should not only have patent tubes but should also have had mature eggs collected for replacement. Eggs must be collected as close to ovulation as possible, to give them a good chance of fertilizing upon replacing them directly into the tubes with the spermatozoa. Preliminary results from three patients who received Fallopian replacement of immature eggs followed by delayed intrauterine insemination indicate that maturation of eggs can occur in vivo in the Fallopian tubes. Intrauterine insemination at a later time when the eggs were judged to be mature has given rise to two pregnancies from the three patients with whom this procedure was adopted.

Key words: Fallopian replacement/immature eggs/intrauterine insemination/infertility

Introduction

A variety of forms of assisted conception currently exist, most notably, in-vitro fertilization (IVF) and gamete intrafallopian transfer (GIFT). GIFT is fast becoming the treatment of choice for patients with infertility of non-tubal origin and its use has even been proven feasible in clinics and hospitals that lack traditional IVF facilities (Pavlou and Pampiglione, 1986; Pampiglione et al., 1987). This clinic was slow to adopt GIFT as an alternative to the IVF and intrauterine insemination (IUI) programmes that were already in existence. However, as recent experience with GIFT has been proving extremely encouraging, the technique has finally been adopted as a complement to the IVF and IUI programmes, providing an alternative to IVF for cases of idiopathic and male infertility and as a back up treatment, following consistent failure with IUI.

GIFT provides a physiological meeting of gametes at the natural site of fertilization and the resulting embryos enter the uterus in a physiological manner. The procedure, however, allows no diagnosis of the real fertilization capacity of the gametes involved, unless pregnancy occurs; and, moreover, only mature preovulatory eggs are replaceable with the spermatozoa during the procedure. In the event that only immature eggs are available following egg retrieval, then the only realistic course of action would seem to be to abandon the GIFT attempt and proceed with in-vitro maturation of such eggs, followed by IVF with subsequent uterine (IVF/ET) or tubal transfer (zygote intra-fallopian transfer; Devroey et al., 1986) of resultant embryos. An alternative approach is proposed and three cases are reported in which intrafallopian replacement of immature eggs by laparoscopy was followed by delayed intrauterine insemination.

Case reports

Three women aged between 27 and 33 years, all of whom had previously undergone at least four failed cycles of IUI, were considered for diagnostic laparoscopy augmented with GIFT. All three had been infertile for 4 years or more, and all three had at least one patent Fallopian tube, as previously assessed by hysterosalpingogram.

Multiple follicular stimulation was achieved using a combination of follicle stimulating hormone and human menopausal gonadotrophin. A dose of 10 000 IU human chorionic gonadotrophin was administered in all cases when a steady rise in serum oestradiol was coupled with a leading follicular diameter of 16 mm or greater as determined by ultrasound. From 34 to 35.5 h later, on day 11 of the cycle in all patients, laparoscopic egg retrieval was performed. All eggs collected were placed in Earles' medium supplemented with 10% pooled cord serum. Egg maturity was judged by size, condition of the cumulus and polar body extrusion. In these three cases only immature eggs were available for Fallopian replacement and the decision was taken to return all the eggs at the time of collection without spermatozoa. The patients returned between 20 and 24 h and again between 40 and 48 h after egg replacement, for high intrauterine insemination on both occasions (Tucker et al., 1987). Semen was prepared in each case by standard double wash and ‘swim-up’ techniques at least 2 h prior to each IUI. IUI was performed with a 10 cm Angiocath (Deseret, Utah) loaded with a final 0.3—0.5 ml aliquot of spermatozoal suspension containing 3—8 × 106 spermatozoa. Luteal support was given as 25 mg progesterone daily from 2 days after egg replacement, until a positive beta-HCG level was recorded, or until menses. Patient A, who suffered from polycystic ovarian disease and her husband from azoospermia, had seven immature eggs replaced, followed by delayed frozen/thawed donor insemination. This patient continues with a 25-week twin pregnancy. Patient B, who with her partner suffered from idiopathic infertility, had five immature eggs replaced into her left tube, but failed to become pregnant. Patient C who suffered from polycystic ovarian disease complicated by secondary amenorrhoea, had five immature eggs replaced into her tubes.
followed by delayed IUI with her partner’s spermatozoa, and is currently 21-weeks pregnant with a singleton gestation.

Discussion

The novelty of this approach hinges on the fact that egg maturation appears to be able to occur in vivo within the Fallopian tube. Intrauterine insemination is performed only at a time when egg maturation is estimated to be complete. The chief advantage is that the timing of egg collection need not be so critical as there is no longer the necessity to collect fully mature eggs. This is of particular relevance in GIFT programmes that run to a very tight pre-programmed schedule and where operating theatre time is limited. Where no IVF facilities exist, then immature eggs may still be used in an attempt to achieve pregnancy in that cycle. Further, it may be true that spermatozoal capacitation may occur more readily or effectively during passage through the female reproductive tract to the site of fertilization in the tubes (Lambert et al., 1985), compared to the less physiological 2-h pre-incubation of spermatozoa prior to standard GIFT replacement.

The pregnancies reported here are, we believe, the first in patients to whom this procedure (FREDI) has been applied; and, when appropriate, this technique will be used in future. The concept of in vivo Fallopian maturation of eggs appears practicable, and of significant value in obviating the need for in-vitro maturation, particularly in those units lacking the facility to provide such in-vitro culture.

References


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