Direct Intrafollicular Insemination
A Case Report

Elkin Lucena, M.D.
Jesús A. Ruiz, M.D.
Juan C. Mendoza, M.D.
Andrés Lucena, M.D.
Carolina Lucena, B.S.
Angela Arango, B.S.

Introduction
A new assisted reproductive technique is based on fertilizing a human oocyte inside a preovulatory mature follicle in vivo.4-5

Case Report
In an infertile couple the husband was azoospermic secondary to viral orchitis, and the 34-year-old wife had adhesions on the left as a result of pelvic inflammatory disease. The adhesions were removed surgically. Both fallopian tubes were patent on subsequent laparoscopy. The patient had previously undergone several artificial insemination cycles using a vaginal cup with frozen-thawed donor sperm. The couple gave their consent for treatment with the new technique.

Ovarian hyperstimulation was undertaken. The patient received clomiphene citrate, 50 mg daily from days 5 through 9 of her menstrual cycle; human menopausal gonadotropin, 150 IU, was administered on days 6, 8 and 10 of the cycle, at which time ovarian response monitoring was initiated with ultrasonographic follicle studies using a vaginal transducer and daily serum 17β-estradiol measurements.

On day 12 of the cycle, when follicles >18 mm in diameter were seen and the 17β-estradiol concentrations were >300 pg/mL/follicle, 5,000 IU of human chorionic gonadotropin (hCG) was administered. Eight preovulatory follicles were seen in total.

Twelve hours after the hCG administration, a transvaginal puncture and injection into two follicles in the right ovary was performed using ultrasonographic guidance with a Kretz Combison 3200 echograph and a vaginal transducer using 5-7.5 MHz. Using a Hamilton syringe connected to the transducer needle, 50 μL of a solution containing modified Ham's F-10 culture medium with approximately 200,00 normal motile spermatozoa was injected into each follicle. The fresh donor sperm had been treated with the migration-sedimentation technique.2,3 The follicular diameter remained unchanged, leading us to assume that there was a minimum outflow of follicular fluid. The cul-de-sac was scanned with the ultrasound transducer; there was no evidence of increased fluid. The patient was asked to remain in the supine position for about 15 minutes.

No hormonal tests were performed during the luteal phase. The patient reported a five-day delay in her menses, and pregnancy was confirmed by a serum hCG value of 83 mIU/mL. A subsequent ultrasonogram was consistent with a normally developing pregnancy.

From the Colombian Center for Fertility and Sterilization, Bogotá, Colombia.
Address reprint requests to: Elkin Lucena, M.D., Centro Colombiano de Fertilidad y Esterilidad, Calle 102 No. 15-15, Bogotá, D.E., Colombia.
Discussion

After direct intrafollicular insemination, it is feasible for the human oocyte to become fertilized inside the follicle prior to ovulation; hence, there is a need to ensure that the injection is done prior to ovulation. We did not study the effects of ovum-spermatozoon interaction 12 hours after hCG administration but assume that after that period of time the preembryo was taken up by the fimbria and carried to the endometrial cavity for implantation. Another possibility is that ovulation in any injected or noninjected follicle is followed by fertilization of the oocyte in the pouch of Douglas or inside the fallopian tube.

A further step with this technique will be the aspiration of follicular fluid approximately 12 hours after the luteinizing hormone peak (before follicular rupture) to try to demonstrate the zygote and confirm that fertilization has occurred.

The advantages of the procedure are similar to those of vaginal intratubal insemination in that it does not require anesthesia, the cost is low, psychological trauma is minimal, and there is no need for the in vitro manipulation of oocytes, as required for gamete intrafallopian transfer and in vitro fertilization and embryo transfer.

The technique is an alternative for infertile women with at least one patent, functionally normal fallopian tube and an adequate ovarian response and may thus be used before attempting more invasive treatments, such as gamete intrafallopian transfer and in vitro fertilization and embryo transfer. As of November 1990 we had performed 14 such procedures, with four ongoing pregnancies and one normal vaginal delivery of a female infant who weighted 3,200 g; she was born to the woman described above.

References

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