

ORIGINAL ARTICLES

Successful delivery despite conception with a maximal endometrial thickness of 4 mm

J. H. Check, M.D., Ph.D.; C. Dietterich, R.T., R.D.M.S.; M. L. Check, B.A.; Y. Katz, M.S.

*The University of Medicine and Dentistry of New Jersey, Robert Wood Johnson Medical School at Camden,
Cooper Hospital/University Medical Center, Department of Obstetrics and Gynecology,
Division of Reproductive Endocrinology & Infertility, Camden, NJ (USA)*

Summary

Purpose: To evaluate the minimal endometrial thickness at the time of ovulation at which conception is possible.

Methods: Treatment with luteal phase progesterone support after oocyte release despite attainment of a maximal thickness of 4 mm.

Results: A pregnancy and successful delivery were achieved.

Conclusions: Pregnancy is possible with only a 4 mm peak endometrial thickness, at least when follicle maturing drugs are not used.

Key words: Pre-ovulatory; Successful conception; Thin endometrium.

Introduction

Reduced fecundity has been demonstrated in women having in vitro fertilization-embryo transfer (IVF-ET) with thin endometria at the time of human chorionic gonadotropin (hCG) injection [1, 2]. One review of the literature concluded that there were no successful pregnancies following IVF-ET when the pre-ovulatory endometrium was < 6 mm [3]. However, a subsequent case of a successful pregnancy following IVF-ET with a pre-ovulatory endometrium of only 4 mm has been reported [4].

There have been few studies on the importance of pre-ovulatory endometrial thickness in non-IVF cycles. One study of women treated with human menopausal gonadotropin (hMG) but not having IVF-ET found no pregnancies with a thickness < 7 mm [5]. However, the case presented here describes a successful pregnancy in a non-IVF cycle where the maximum pre-ovulatory endometrium only reached 4 mm.

Case Report

A case is described of a 29-year-old woman who has successfully delivered a baby girl despite attaining a maximum endometrial thickness of only 4 mm in a natural cycle. She had been on oral contraceptives for 14 years because of a history of formation of ovarian cysts that resulted in an oophorectomy at age 15. She gave no history of a previous D&C, endometritis, or intrauterine exposure to diethylstilbestrol. She had been treated with 81 mg aspirin because of the presence of anticardiolipin antibodies. Two months after stopping oral contraceptives the patient was monitored for a cycle before being allowed to conceive. She obtained a mature follicle with a serum estradiol (E2) of 239 pg/ml but her endometrial thickness reached a

maximum of 2 mm. Subsequently she was treated with oral E2, 2 mg per day, but after ten days of treatment her maximum endometrial thickness reached 3 mm despite a serum E2 of 857 pg/ml. Ultrasound showed no dominant follicles. She continued the cycle without any follicle stimulating drugs. By day 17 she attained a dominant follicle with a serum E2 of 174 pg/ml and a 4 mm endometrial thickness. Her peak E2 reached 181 pg/ml day 18 when a luteinizing hormone (LH) surge occurred (4 mm endometrial thickness). After oocyte release she was treated with progesterone (P) vaginal suppositories. She conceived that cycle and delivered full term without any complications.

Discussion

The fact that this woman conceived with an endometrium of only 4 mm does not negate studies that conclude that failure to attain an adequate pre-ovulatory endometrial thickness in IVF-ET cycles or those without assisted reproductive technology may be associated with reduced fecundity [1-3, 5]. The present case however clearly demonstrates that successful pregnancy is possible with a 4 mm endometrium even in a cycle without follicle stimulating drugs.

The knowledge that a pregnancy can be achieved with this minimal thickness can aid some patients and physicians in making decisions that best suit the couple. The knowledge that a precedent exists for a successful conception and completion of the first trimester with a very thin pre-ovulatory endometrium, might give encouragement to couples faced with similar clinical circumstances to be more patient before considering a gestational carrier.

Furthermore, if the patient failed to attain an adequate endometrial thickness pre-ovulatory, but could attain an adequate growth with pharmacologic dosages of estrogen, one could consider IVF-ET, cryopreservation of the embryos, and transfer on a high-dose estrogen-P replacement cycle. However, knowledge of a previous case

Revised manuscript accepted for publication March 15, 2003

achieving a successful pregnancy with such a thin endometrium might allow the patient to try more natural cycles before proceeding to more expensive IVF-ET with its inherent risk of ovarian hyperstimulation syndrome.

Though the patient conceived on her very first cycle with mere P support in the luteal phase, it is not clear what percentage of patients may expect success with similar circumstances. In the study by Isaacs *et al.*, there were only 15 cycles where the endometrial thickness was < 7 mm with no conceptions occurring [5].

References

- [1] Check J. H., Nowroozi K., Choe J., Dietterich C.: "Influence of endometrial thickness and echo patterns on pregnancy rates during in vitro fertilization". *Fertil. Steril.*, 1991, 56, 1173.
- [2] Gonen Y., Casper R. F., Jacobson W., Blankier J.: "Endometrial thickness and growth during ovarian stimulation: a possible predictor of implantation in in vitro fertilization". *Fertil. Steril.*, 1989, 52, 446.
- [3] Friedler S., Schenker J. G., Herman A., Lewin A.: "The role of ultrasonography in the evaluation of endometrial receptivity following assisted reproductive treatments: a critical review". *Hum. Reprod. Update*, 1996, 2, 323.
- [4] Sundstrom P.: "Establishment of a successful pregnancy following in-vitro fertilization with an endometrial thickness of no more than 4 mm". *Hum. Reprod.*, 1998, 13, 550.
- [5] Isaacs J. D. Jr., Wells C. S., Williams D. B., Odem R. R., Gast M. J., Strickler R. C.: "Endometrial thickness is a valid monitoring parameter in cycles of ovulation induction with menotropins alone". *Fertil. Steril.*, 1996, 65, 262.

Address reprint requests to:
J. H. Check, M.D., Ph.D.
7447 Old York Road
Melrose Park, PA 19027 (USA)