
CASE REPORT

Transvaginal-Transmyometrial Embryo Transfer

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ABSTRACT

Transcervical embryo transfer is performed in most in vitro fertilization programmes. However, there are occasional cases where this method is not possible. In this report, we presented one successful case employing transvaginal-transmyometrial embryo transfer. Experience with transmyometrial transfer is still very limited, and the pros and cons of this method are discussed.

Key words : transmyometrial embryo transfer, Towako needle, in vitro fertilization

Transvaginal transmyometrial method of embryo transfer (ET) involves the passage of a catheter through the vaginal fornices into the abdominal cavity and through the myometrium into the endometrium. This technique is not new and has been successfully used in the cattle.⁽¹⁾ In the human there have also been attempts to replace embryos surgically into the uterine cavity. However the cavity is not easily accessible through the abdominal wall even with ultrasound guidance, and the results are poor.^(2,3)

At the present almost all in vitro fertilization (IVF) programmes perform embryo transfer (ET) via the cervical route.^(1,4) However there are occasional cases that transcervical ET is difficult

or impossible to perform.^(4,5) To overcome this problem Kato et al⁽⁵⁾ attempted transmyometrial ET under transvaginal ultrasound guidance and reported a clinical pregnancy rate of 36.5% per attempt in a group of 104 cases. In this report, we presented our experience with a case of difficult transcervical ET that necessitated the use of transmyometrial ET.

Case Report

The patient was a 34-year-old female with primary infertility for 7.5 years. She had been attending the infertility clinic at Maharaj Nakorn Chiang Mai University Hospital since 1990. Unexplained infertility was diagnosed and gamete

intrafallopian transfer (GIFT) and zygote intrafallopian transfer (ZIFT) were performed in two clomiphene citrate cycles in 1993 but were not successful. Two years later IVF was performed in a gonadotropin releasing hormone agonist (GnRH-a) and human menopausal gonadotropins (HMG) superovulation cycle. The embryo transfer was found to be extremely difficult and she failed to conceive despite the transfer of three good embryos. Another cycle of IVF/ET was planned and it was found during mock ET that the catheter could not be passed through the cervix. Transmyometrial embryo transfer using the Towako needle was then contemplated.

Long luteal protocol for superovulation was employed as previously described.⁽⁶⁾ She was started on HMG 150 units (Humegon ; Organon) beginning on day 3 of the cycle. Estradiol (E_2) level and ultrasonography were used to monitor growth of the ovarian follicles. hCG 10,000 IU (Profasi ; Serono) was given on day 16 when her E_2 level was 1,800 pg/ml and two of the follicles attained a size of 17 mm. Transvaginal oocyte retrieval was performed 36 hours later. Twelve metaphase II and one metaphase I oocytes were recovered. The insemination was done 3 hours after oocyte pick-up. Nine of the twelve mature oocytes achieved fertilization and 4 of the best-looking embryos at 4- to 6-cell stage were transferred 2 days after oocyte retrieval.

The transvaginal-transmyometrial transfer technique was performed under ultrasound guidance. The patient was sedated with pethidine 75 mg and diazepam 10 mg intravenously. A 5-Mhz endovaginal ultrasound transducer (SSD 620 Aloka ; USA) with a needle guide was introduced into the vagina. After vaginal preparation with normal saline solution, an 18 gauge "Towako" needle (Cook ; Australia) was inserted

through the vaginal wall and the myometrium into the endometrium at the level of the uterine fundus. The catheter, 325 mm in length and 0.8 mm in diameter, was loaded with the embryos in 20 ul of culture medium. The catheter was passed into the needle until its hub sat firmly against the luer-lock fitting of the needle, indicating that it was protruding 1 mm from the needle tip. The embryos were then transferred into the endometrium by gentle injection. The transfer was visualized on the ultrasound screen by the brightness caused by the echogenicity of the culture medium. The needle and the catheter were gently removed and checked for the retention of embryos. The patient was discharged soon after that. Progesterone 100 mg/day (Proluton, Schering) was prescribed intramuscularly to support the luteal phase. Serum beta-hCG was checked in 2 weeks' time and was found to be more than 500 mIU/ml. Ultrasonography showed two gestational sacs at 7 weeks and 2 days with positive fetal heart beats. The luteal phase was supported until 10 weeks of gestation. Her pregnancy was uneventful and elective caesarean section was performed at 37 weeks and 4 days due to breech presentation of the first twin. A healthy female infant weighing 2,130 g and a healthy male 2,550 g were delivered.

Discussion

Despite technical advances in the practice of IVF, the implantation rate per embryo has not increased significantly and remains between 10-15%.⁽⁷⁾ One area of possible improvement may lie in the embryo transfer technique. During ET, speed is essential because the embryos are carried in small volume of medium (20-50 ul). Any delay or difficulty in entering or passing the catheter through the cervical canal will result in

changes in the temperature, pH and osmolarity of the medium. It is familiar to most IVF clinic that poor embryo transfer technique is almost always responsible for a downturn in pregnancy rates.^(8,9)

At Maharaj Nakorn Chiang Mai Hospital, most ETs are done transcervically, using Tomcat Catheter. However, there are occasional cases that it is very difficult or impossible to pass the catheter through the cervix, as in this reported case. In a recent study by Sharif et al,⁽⁴⁾ they found that they needed to resort to transmyometrial transfer in 13 out of 231 embryo transfers. The clinical pregnancy rate per ET in this group was also acceptable, comparing to conventional ET (23% versus 28.9%). Therefore, there is definitely a place for transmyometrial ET. This method may also have certain advantages over conventional transcervical ET such as :

1. By transferring the embryos right into the endometrial stroma, there should, theoretically, be much less chance of the embryos being expelled from the uterine cavity. A report by Knutzen et al⁽¹⁰⁾ showed that the radiopaque dye injected during mock ET could move into the fallopian tubes, or out through the cervix into the vagina. Nakayama et al⁽¹¹⁾ reported that intra-endometrial transfer in the mouse model resulted in a higher pregnancy rate than conventional embryo transfer.

2. Transcervical ET can lead to the possibility of bacterial contamination of the uterine cavity. Indeed in a recent study by Egbase et al,⁽¹²⁾ they reported that microbial contamination during ET may influence implantation rates. In their study, clinical pregnancy rates per ET were 57.1% in the group of patients without growth and 29.6% in the group with positive microbial growth from the catheter tip. There is also a report of ruptured tubo-ovarian abscess complicating transcervical cryopreserved ET⁽¹³⁾ and a pelvic abscess after transcervical ET.⁽¹⁴⁾ All these

confirm that contamination can happen after trans cervical ET inspite of precaution.

3. Cervical mucus at the cervix may obstruct the ET catheter or be carried into the endometrial cavity, which may interfere with embryo implantation. This can be avoided by performing transmyometrial transfer.^(4,5)

4. It avoids false tract created by difficult transcervical ET which can lead to intramural pregnancy.⁽¹⁵⁾

Transmyometrial ET also has its disadvantages. For example it is more painful and may require intravenous sedation and it may result in some bleeding from the puncture site. However, it is encouraging that there has been, so far, no complication in the 104 cases reported by Kato et al⁽⁵⁾ and in the 13 cases reported by Sharif et al.⁽⁴⁾ Moreover with experience, both groups reported that no sedation or analgesia was required for transmyometrial ET.

In summary, we have presented a case of successful pregnancy achieved by transmyometrial ET using the Towako needle. In this case it is not possible to do ET via the cervical route. We suggest that transmyometrial ET is a good alternative to transcervical ET and should be considered in case of difficult cervical ET.

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