

Pregnancy achieved by transfer of thawed day 3 embryos that had been frozen after assisted hatching: a case report

Parsiyel zona disseksiyonu sonrası dondurulmuş 3. gün embryo transferindeki başarılı gebelik: olgu sunumu

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Abstract

Assisted Hatching (AH) is performed to increase implantation rates in assisted reproductive techniques, especially recurrent implantation failure and older age group. AH can be performed to four different techniques as laser, mechanical, enzymatic, chemical methods. In the literature, there is limited data about embryo freezing after AH. Herein, a successful pregnancy, which was achieved by transfer of thawed 3rd day embryos that had been frozen after AH, is presented. (J Turkish-German Gynecol Assoc 2010; 11: 55-7)

Key words: Assisted Hatching, Embryo Thawing, IVF

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Özet

Parsiyel Zona Disseksiyonu (PZD), yardımcı üreme tekniklerinde implantasyonu artırmak amacıyla özellikle tekrarlayan implantasyon başarısızlıklarında ve ileri yaş IVF/ICSI sikluslarında gebelik oranını artırmak amacıyla uygulanmaktadır. PZD lazer, mekanik, enzimatik ve kimyasal olarak farklı metodlarla uygulanmaktadır. PZD sonrası embryo dondurma ile ilgili bilgiler literatürde sınırlıdır. PZD sonrası dondurulmuş 3. gün embryoların, çözülmesi sonrası transferinde sağlanan gebelik, bir olgu olarak sunulmuştur. (J Turkish-German Gynecol Assoc 2010; 11: 55-7)

Anahtar kelimeler: Parsiyel Zona Disseksiyonu, Embryo Çözme, IVF

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Introduction

The clinical application of assisted hatching (AH) has been proposed as one approach toward the enhancement of implantation and pregnancy rates following in vitro fertilization (IVF). Investigators postulated that the opening of the zona might enhance the subsequent hatching process. Assisted hatching may be clinically useful in patients with a poor prognosis, including those with 2 failed IVF cycles and poor embryo quality and older women (38 years of age) (1-2). The assisted hatching procedure is generally performed on day 3 after fertilization using various methods. These include the creation of an opening in the zona either by drilling with acidified Tyrode's solution (3, 4), PZD (partial zona dissection) with a glass microneedle (Figure 1) (5), laser photoablation (6). In the literature, there is limited data about embryo freezing after AH. Herein, a successful pregnancy achieved by transfer of thawed 3rd day embryos that had been frozen after AH, is presented.

Case

A 24 year-old G0, P0 woman was admitted to the Baskent University Department of Obstetrics and Gynecology, Division

of Reproductive Medicine and IVF Unit with 6 years infertility. On the assessment of the patient; the basal ultrasonographic findings showed that bilateral ovaries had 5-6 antral follicles, third day hormonal parameters were within the normal range (FSH: 5.4 IU/ml, LH: 4.3 IU/ml, E2: 35 pg/ml). For the evaluation of the endometrial cavity, sonohysterography has been performed which has revealed regular endometrium. Her hysterosalpingography revealed a normal uterus with bilateral patent tubes. Sperm analysis was as follows: sperm count: 1.200.000/ml (2 ml) and motility A: 0%, B:5%, C: 5% D: 0%. Another 3 sperm analyses were similar.

The patient was scheduled to the IVF/ICSI program with the diagnosis of severe oligoasthenospermia. Ovarian down regulation was initiated with daily leuprolide acetate 1 mg (Lucrin, Abbott, France), beginning on the 2st day of the preceding menstruation. After ovarian suppression was achieved, the dose was then reduced to 0,5 mg and ovarian stimulation was started using 150 IU of recombinant FSH (Gonal-F, Serono, Randolph, MA, USA) which was increased on the 5th day of stimulation to 225 IU. On the 10th day of stimulation she received 10000 IU of hCG. She had transvaginal oocyte retrieval of 8 oocytes of which 8 were mature, and underwent ICSI resulting in 6 cleaving embryos.

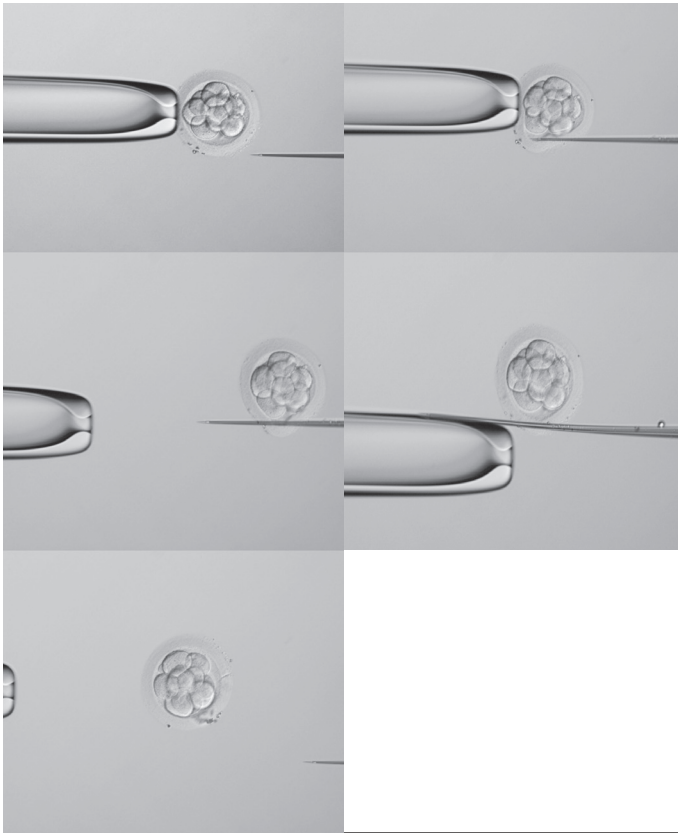


Figure 1. Representative Pictures of Assisted Hatching Procedures

Seventy-two hours after oocyte retrieval, the patient was called for embryo transfer. Three embryos were selected for transfer. During embryo selection, all embryos had thicker zona pellucida and poor embryo quality. Thereafter, assisted hatching was performed mechanically via inverted microscope with a micromanipulator before the transfer. While cervical mucus cleaning was being performed, pelvic ultrasonography showed endometrial fluid. Before embryo transfer, transfer catheter was inserted into the uterine cavity to aspirate endometrial fluid, which was purulent. Endometrial purulent fluid was cultured. Embryo transfer was postponed and embryos which assisted hatching had been performed were frozen via slow freezing.

The patient was hospitalized for antibiotic therapy. Gentamycine 2 mg/kg loading dose and 1,5 mg/kg maintenance dose together with clindamycine 900 mg tid were administered to the patient. Before antibiotics, the patient had pelvic discomfort which had been assumed to be due to oocyte retrieval. The patient's pelvic pain was relieved and her CRP and leucocytosis regressed to the normal range after antibiotherapy. Interestingly, the patient had no fever. She was discharged with oral metranidazole 500 mg bid with doxycycline 200 mg bid for two weeks.

Two months later, she was prepared for the thawing cycle, with ovarian down regulation starting with daily leuprolide acetate 1 mg (Lucrin, Abbott, France), beginning on the 21st day of the preceding menstruation. The endometrium was prepared with 2 mg/d estradiol valerate (Cyclo-Progynova tb, SCHERING

together with a transdermal patch containing 100 μ gr estradiol (Estraderm TTS, Novartis). The endometrial pattern was monitored with serial ultrasonography. After support with progesterone to the endometrium (Progestan kapsul, Koçak Farma), on the 16th day of the cycle, 3 embryos which had not degenerated were thawed. After embryo transfer, the luteal phase was supported by intravaginal 90 mg progesterone daily (Crinone 8% gel, Serono). 10 days after transfer, the first β HCG was 80 IU and doubling of hCG was observed 2 days later. Pregnancy was confirmed by visualization of single fetal cardiac activity appropriate to 6 weeks of gestation. The patient was delivered via caesarian section at the end of 32 weeks due to severe preeclampsia. A 1950 gr male baby was born with a 10 APGAR score. The patient was discharged on the second post-operative day. The newborn was discharged 15 days after admission to the neonatal intensive care unit.

Discussion

The assisted hatching procedure is generally performed on day 3 after fertilization using various methods with similar success rates (7). Transfer of frozen-thawed blastocysts which underwent quarter laser-assisted hatching on day 3 of the cleaving stage before freezing was previously reported in the literature (8). Herein, we presented the first case report of a successful pregnancy achieved by transfer of thawed day 3 embryos that had been frozen after AH. In this case, we performed AH to 3 selected embryos due to poor embryo quality and thick zona pellucida. Endometrial fluid visualized through ultrasonography during ovarian stimulation in IVF cycles impairs the outcome (9). On the day of embryo transfer, pelvic ultrasonography revealed a collection of endometrial fluid with absence of any symptoms of pelvic inflammatory disease. After endometrial aspiration, the presence of purulent endometrial fluid obligated us to freeze the selected poor embryos on which AH had already been performed. Although we hesitated to freeze day 3 embryos on which AH had been performed due to the risk of embryo degeneration of freezing and scarce literature, a relative good quality of thawed embryos and a successful pregnancy after thawing cycle was optimizing and interesting.

The assisted hatching procedure may be associated with specific complications independent of the IVF procedure itself, including lethal damage to the embryo and damage to individual blastomeres, with reduction of embryo viability. In addition, artificial manipulation of the zona pellucida has been associated with an increased risk of monozygotic twinning (10, 11).

This case shows that AH might have no risk for embryos if freezing is planned or obligated. The implantation and success of transfer of frozen-thawed day 3 embryos on which AH had been performed could be debated, whereas, this case report might open a horizon for further considerations.

Conflict of interest

None declared

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