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A Successful Ongoing Pregnancy after Electro Microscope (EM) Grid Vitrification of Human 6-cell Embryos: Case Report

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Background & Objectives: Vitrification has been emerged as a promising technique for cryopreservation of human embryos or oocytes preventing ice crystal formation and chilling injuries by ultra-rapid cooling rate. Recently, several successful pregnancies have been reported after vitrification of blastocysts or oocytes using cryotop, cryoloop, electron microscope (EM) grid, or hemi-straw. However, pregnancy following vitrification of cleavage embryos using EM grid has been not reported. Here we describe a successful ongoing pregnancy after EM grid vitrification of human 6C embryos.

Method: A 31-years-old woman (para; 0-0-0-0) underwent controlled ovarian hyperstimulation (COH) by recombinant FSH and GnRH antagonist for the first in vitro fertilization (IVF) cycle. She had a history of pelvic surgery due to endometriosis (stage IV) and prior two cycles of COH and intrauterine insemination were failed. The husband's sperm characteristics were within normal range by WHO criteria. Eleven oocytes were retrieved as a mature form and ten zygotes were obtained following conventional IVF and ICSI. Two good quality 8C embryos were transferred on day 3, but no implantation occurred. The remaining seven 6C embryos (one 4C embryo arrested) were vitrified using a two-step protocol with EM grid. The equilibration solution was a mixture of 7.5% ethylene glycol (EG) and 7.5% propylene glycol (PROH). The vitrification solution was composed of 15% EG, 15% PROH and 0.5 mol/L sucrose. Two months later, four vitrified 6C embryos were thawed on the day before uterine transfer. The patient's endometrium was prepared by estradiol valerate 4 mg/d orally with progesterone 50 mg/d IM.

Results: All embryos were survived completely without any damaged blastomere and developed to 8C embryos on the next day. Therefore, four embryos were transferred into the patient's uterus. At post-transfer 20 days, three intrauterine gestational sacs were identified by ultrasound. At post-transfer 29 days, two fetal hearts were checked.

Conclusions: Vitrification using EM grid can be suggested an efficient method for freezing of human cleavage stage embryos.