

P043

In vivo maturation and in vitro fertilization after cryopreserved mouse ovaries and subcutaneous autotransplantation

Chung-Hao Lu¹, Hsin-Yi Ho² and Robert Kuo-Kuang Lee^{1,2}

1.Division of Reproductive and Endocrinology department of Medical Research, Mackay Memorial Hospital

2.Division of Reproductive Endocrinology and Infertility, Mackay Memorial Hospital

BACKGROUND: As compared with orthotopic transplantation in pelvic cavity or heterotopic transplantation under renal capsule, subcutaneous transplantation is easier to perform the transplantation, to monitor the development of ovarian stimulation, and much easier to have ovum picked up. Ovarian tissue cryopreservation with subcutaneous transplantation is the most applicable procedure for clinical use, but it is still needed to verified the efficacy.

METHODS AND RESULTS: In this study, female mouse ovaries will be placed in various cryoprotectants and processed with slow freezing and fast thawing procedure. After autologous transplantation into subcutaneous tissue, controlled ovarian stimulation with gonadotropin and ovum retrieval for in vitro fertilization will be performed. 2PN Embryos from IVF will be transferred to oviducts of surrogates to deliver offspring.

RESULTS: Survive rate of cryopreserved ovaries (n = 16) was 87.5 % 14 days after autologous transplantation into subcutaneous tissue. On 14th days after transplantation, ovarian graft were recovered and processed histologically for follicle number counting. The rates of follicle loss after subcutaneous transplantation in the group of fresh ovary and the group of cryopreserved ovary were 26.8 % and 32.06 % respectively, as compared with the fresh ovaries obtained from the other side ovaries of the same mouse. The study indicate that transplantation rather than cryopreservation accounts for the major and early loss of follicles in grafted mice ovaries. In vivo matured oocytes of cryopreserved ovaries from superovulated mice were fertilized in vitro can development to 8 cell stage embryo.

In this experiments, it may be concluded that in vivo maturation by grafting followed by in vitro fertilization of frozen - thawed ovaries could make the chance to restore fertility in mice. Ovarian tissue cryopreservation with subcutaneous transplantation is the most applicable procedure for clinical use.