

3rd International Conference & Exhibition on**TISSUE PRESERVATION AND BIOBANKING &**6th International Conference on**TISSUE ENGINEERING AND REGENERATIVE MEDICINE**

August 23-24, 2017 San Francisco, USA

Ovarian function recovery after transplantation of ovarian tissue cryopreserved and stored for long-term

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Statement of the Problem: Ovarian tissue cryopreservation represents a valid strategy to preserve ovarian function in cancer patients with a high risk of premature ovarian failure due to chemo/radiotherapy. The ovarian tissue remains frozen for very long period of time (the request of tissue replanting usually occurs after at least five years from the end of therapies and this period may dragging on further in the case of diseases that require prolonged treatments or in the case of pediatric patients). The purpose of this study is to evaluate the morphology and functional activity of cryopreserved ovarian tissue stored for 18 years after thawing and transplantation.

Methodology & Theoretical Orientation: Ovarian tissue of a 29 year old patient suffering from Hodgkin Lymphoma was cryopreserved at our Centre before starting anticancer treatment. 18 years after storage; her ovarian tissue was evaluated by light microscopy, transmission electron microscopy, TUNEL assay and LIVE/DEAD viability/cytotoxicity test and then heterotopically transplanted in two subcutaneous pockets of patient. Follicle development was evaluated by ultrasound examination on the graft sites.

Findings: Ovarian tissue showed a good morphology, no apoptosis signs, sub-cellular integrity of follicles and interstitial edema foci. The LIVE/DEAD assay performed on stromal cells, isolated from cryopreserved tissue, showed viable cells (>97%) after 2 and 7 days of culture. The patient had the first menstruation five months after transplantation and to date (20 months from the graft), she is regularly menstruating every 30-40 days. Follicular development is monthly evidenced by a bulge palpable beneath the skin in the graft sites.

Conclusion & Significance: This study provides evidence that the storage time does not impact on tissue quality and on tissue ability to resume the ovarian function after replanting. These results give hope especially to cancer girls, whose tissues could remain cryopreserved for a very long time.

Biography

Raffaella Fabbri has been working as a Biologist in the Human Reproductive Medicine Unit, S Orsola-Malpighi Hospital of University of Bologna in Italy since 1977. In 2001, she received a national and international worldwide patent about method and solution for cryopreserving oocytes. In 2006, she obtained the United States Patent US 7,011,937 B2 for method and solutions for cryopreserving oocytes. She has her expertise in cryopreservation of human mature and immature oocytes, cryopreservation of embryos and blastocysts, cryopreservation of human ovarian tissue *in vitro* maturation of ovarian follicles, co-cultures of human granulosa cells and sperms, fertilization and embryonal development. She has been involved in many scientific activities which are well-documented by 335 articles published in Italian and foreign journals, participated in 134 meeting as speaker and 58 as Auditor.

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