

Ovarian Tissue Freezing



Concept
Fertility
Centre

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Background

Ovarian tissue collection and cryopreservation has been developed for patients who are facing the possible loss of their ovarian function and / or oocyte quality due to various medical conditions or necessary medical therapies. The outer coating of the ovary, the cortex, normally contains an abundance of primordial follicles, which contain very immature oocytes (eggs). Ovarian tissue cryopreservation has been developed with the hope that by collecting and storing the tissue now, patients may at some time in the future use the tissue as a source of healthy oocytes.

Ovarian tissue cryopreservation has been studied for over 40 years however, it has only been in the last few years that technologies have been available to cryopreserve samples with any success. The technology is still considered "experimental", and as such there is no guarantee of successful recovery of the tissue from storage. Much research is occurring worldwide, especially in the area of thawing the tissue and methods to stimulate mature follicle formation.

At present the two main approaches are growth and development of the follicles in vitro or transplantation of the tissue back into the patient or into a host. Although the results seen so far are encouraging, very few pregnancies have been initiated with post-thaw ovarian tissue.

The first birth following transplant of frozen ovarian tissue was reported in September 2004. To date around 20 children have been born world-wide following transplantation of ovarian tissue.

Procedure

Ovarian tissue collection involves surgery, usually in the form of laparoscopy, this involves a visualizing instrument inserted through a small incision in the abdomen. Several other small puncture incisions are made for the other instruments which are required for holding the ovary and obtaining the pieces of ovarian tissue. The exact method can vary from patient to patient; therefore your Gynecologist will explain the procedure in detail prior to surgery.

At the time of the tissue collection, small slices of tissue are shaved off the ovary (approximately half the size of a thumbnail) and placed into a special solution for transportation by the embryologist to the laboratory for processing and storage. A small amount of the tissue is evaluated to confirm the presence of primordial follicles, and the remainder is prepared for storage. The tissue is placed into a special media containing a cryoprotectant and then packaged into small plastic vials that are labeled with the patient's name and file number. The vials are then placed into a pre-programmed machine and frozen to -196°C , before being stored in liquid nitrogen.

Risks

There are some risks associated with the laparoscopy, and adverse outcomes are seen in less than 1% of all cases. Your Gynecologist will be able to discuss these with you.

It is possible that when the tissue is thawed it may not yield usable oocytes, or may not result in pregnancy. The process of freezing the tissue or its prolonged storage may result in some damage to the immature follicles.

The collection of tissue is not thought to adversely affect any potential chance of the ovaries producing oocytes at a later date. The tissue removed is less than 5% of the total number of oocytes in the ovaries. It is possible however, that the removal could result in scar tissue or damage to the remaining ovarian tissue, which may reduce the chance of pregnancy occurring naturally.

Uncertainties

The objective of ovarian tissue cryopreservation is to preserve an opportunity for the restoration of ovarian function at a later date. There are however, a number of unknowns and uncertainties that need to be considered.

This is an innovative program and as such successful utilization of human ovarian tissue for the purpose of initiating a pregnancy or restoring ovarian function is limited. The medical procedures offered are

based on the results of animal experiments, and preliminary human experimentation. The team at Concept Fertility Centre has extensively reviewed research from around the world and employs techniques that are at present considered the most appropriate. The techniques for actual use of the tissue and development of healthy mature oocytes will be the focus of ongoing research that may take years to yield results. There is a possibility that such techniques may not become effective or safe enough to allow the use of the tissue in all patients.

Screening, Consent and Costs

All patients having ovarian tissue stored are required to undergo blood tests for Hepatitis B and C and HIV and complete the Ovarian Tissue Cryopreservation Consent form. This form indicates the patient's wishes with regard to the ovarian tissue that they do not use. The options are to either donate the tissue to research or to discard the tissue. The consent form also explains the costs of the storage.

Children born after ovarian freezing

It is not known whether children born as a result of using oocytes from stored ovarian tissue will have an increased risk of abnormalities. This type of uncertainty is common with any new method of laboratory-assisted reproduction.

Further Information

Further information on ovarian tissue cryopreservation is available from either the Scientific Director or Laboratory Manager, whom can be contacted via Concept Fertility Centre's main reception.

Steps involved in ovarian tissue freezing:

- Laparoscopic surgery to collect small slices of the ovary
- Ovary slices are prepared for freezing in the laboratory
- Ovary slices are transferred to labelled vials
- The vials are placed into a computer controlled freezer machine and slowly frozen at a controlled rate
- The vials are then removed from the freezer machine and stored at -196°C
- When needed the ovary slices can be thawed and then transplanted.

Questions and Notes

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