Media Release

Breakthrough ovarian transplant surgery may preserve fertility for cancer patients

Women who are diagnosed with cancer face the distressing prospect that they may have to undergo long-drawn treatments. Younger women especially face the even harder truth that the life-saving chemotherapy may dash their hopes of giving birth in the future.

An ovarian tissue cryopreservation and a breakthrough Ovarian Orthotopic Transplant surgery performed by surgeons at the Singapore General Hospital (SGH) may now help to preserve ovarian functions before women commence cancer treatment, giving them the option of conceiving and starting a family after treatment and remission.

“This procedure is more than just assisted reproduction. It is about taking a part of the ovary before its functions are damaged, freezing it for several years and transplanting it back to the same patient after her cancer is in remission,” said Dr Yu Su Ling, Director, Centre for Assisted Reproduction (CARE) and Senior Consultant, Department of Obstetrics & Gynaecology, SGH.

SGH carried out the Ovarian Orthotopic Transplant in August last year on a 40-year-old married woman who suffered from breast cancer. Her ovarian tissues were transplanted back to the natural ovary location (orthothopic implant) three years after she was treated for cancer. The patient resumed menstruation three months after the transplant, indicating that she is ready for conception again.

About the Ovarian Orthotopic Transplant

Before starting on chemotherapy, a patient would undergo a keyhole procedure to remove one of the ovaries. The specimen is then transported on ice to the laboratory where the ovary tissue is cut into small strips, of no thicker than 1 millimeter to enable rapid restoration of blood supply post transplant. These are then slow freeze to liquid nitrogen temperature of almost minus 200 degree Celsius, called cryopreservation.

The patient undergoes cancer treatment thereafter. In most cases, transplant of the ovary back into the patient’s body can only take place at least two years after the end of cancer treatment, when the risk of relapse has greatly reduced.
Before the transplant, one strip of the frozen tissue will be thawed and checked for any spread of cancer. If there is no trace of malignancy, the other ovarian pieces would be thawed and transplanted within an hour.

Three horizontal incisions are made at the ovary site for transplant. The thawed pieces of the ovarian tissue would be placed in the incision site and sutured closed. If there are any remaining tissues, they will be transplanted into the right ovarian fossa, the depression near the wall of the pelvis.

The transplant is successful when there is growth of ovarian follicles and cessation of menopausal symptoms after a few months.

“The freezing of ovarian tissue and storage has shown to preserve the functions of the ovary and vitality of egg follicles, even after several years of storage in liquid nitrogen. Doctors should offer this option of preserving and restoring fertility to suitable patients as part of holistic treatment,” said Dr Yu.

Cancer in women

Advances in cancer treatment and diagnosis have led to the increased survival rate of patients with cancer. However, treatments like chemotherapy can lead to early menopause and onset of ovarian failure, occurring in 80 per cent to 100 per cent of such cases. Common cancers in women include blood and breast cancers. Breast cancer is the most common cancer, making up 29% of the top cancer conditions in Singaporean women.

About 1,200 babies were born in Singapore through Assisted Reproduction (AR) treatments in 2009. That is a 44 per cent spike from over 800 babies born this way in 2007. In 2009, about 3,300 women used AR treatments, almost double the number in 2004.

To date, there are at least 20 live births worldwide from ovarian tissue cryopreservation from women with previous cases of cancer.

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Fact Sheet

Assisted Reproduction Methods of Fertility Preservation

There are currently three assisted reproduction methods of fertility preservation for the female before she undergoes sterilising chemotherapy and radiotherapy. One can freeze egg cells retrieved from the woman; freeze embryos if she has a partner or freeze the ovarian cortex.

If chemotherapy can be postponed for two weeks, ovarian stimulation, egg cell retrieval and freezing of egg cell or embryos can be performed. If the cancer treatment is urgently required, women now have the choice of ovarian tissue cryopreservation, which can be done under general anaesthesia.

Usually one ovary is removed via laparoscopy, or keyhole procedure and small cut pieces of ovarian cortex is cryopreserved. If the patient does not have a partner, ovarian tissue preservation is recommended.

The risk of premature ovarian failure is dependent on factors such as the age of the patient, the type and the dose of toxic therapy. Chemotherapy involving the use of alkylating agents, poses the highest risk of ovarian failure as it leads to follicular depletion when the toxic dosage increases during treatment.