THE UNIVERSITY of EDINBURGH

News Release

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Frozen tissue service offers fertility hope for children with cancer

Young people with cancer are set to benefit from a new service that aims to restore their fertility following chemotherapy.

Scientists are freezing tissue from the reproductive organs of boys and girls as young as one, which can be re-implanted once they reach adulthood.

The announcement follows the birth of the first baby in the UK to be born after his mother had a transplant of her own, previously frozen ovary tissue.

The 33-year-old from Edinburgh had a section of her ovary removed 11 years ago after being diagnosed with a rare form of cancer.

Following her chemotherapy, doctors re-implanted the tissue last year in the hope of restoring her fertility.

The woman, who wishes to remain anonymous, conceived naturally and gave birth to a healthy baby boy earlier this month.

Her success, which was led by a team at the University of Edinburgh, has been welcomed as a milestone in the effort to help young people with cancer and other diseases whose treatment threatens their fertility.

Chemotherapy and radiotherapy are known to have serious side effects on reproductive organs. If children are given these treatments before they reach puberty, it can render them infertile in later life.

By removing the tissue from children before they undergo cancer treatment, it is possible to protect it from side effects that can render patients infertile.

Scientists say restoring fertility in men can be more challenging than in women because the testicular tissue of prepubescent boys is not yet able to produce sperm. By comparison, girls are born with a full complement of egg cells which can be frozen for transplant at a later stage.

Researchers say the new service, led from the University of Edinburgh, is open to NHS patients.

The research has been funded by the Wellcome Trust, Children with Cancer, the European Union and the Medical Research Council. It has involved close collaboration with the Scottish National Blood Transfusion Service (SNBTS).

Dr Rod Mitchell, Wellcome Trust Intermediate Clinical Fellow, MRC Centre for Reproductive Health at the University of Edinburgh, said: "Clinicians and scientists in Edinburgh have very recently developed a service to store testicular tissue from boys as young as one who are at risk of infertility as a result of cancer treatment. Although still considered experimental, the option to store tissue, combined with research aimed at developing methods to restore fertility, offers real hope of fatherhood for these patients. We hope that in the future we will be in a position to see similar success in young men to that which we have now shown for women."

Professor Richard Anderson, Elsie Inglis Chair of Clinical Reproductive Science, MRC Centre for Reproductive Health at the University of Edinburgh, said: "The storage of ovarian tissue to allow restoration of fertility after cancer treatment in girls and young women was pioneered in Edinburgh over 20 years ago, and it is wonderful to see it come to fruition. This gives real hope to girls and young women facing treatment that may cause them to become infertile, and shows how some medical advances can take a long time to show their benefits. It comes at a time when NHS services for fertility preservation are developing across the UK, and we hope it will be the impetus to provide that to all who are in need."

Rob Thomson, Tissue and Cells Clinical Scientist with the Scottish National Blood Transfusion Service, said: "We are pleased to hear this wonderful news, and are proud to have been part of this scientific breakthrough, a first in the UK. Over the past 20 years, SNBTS has been storing biopsies of ovarian tissue from young women and girls who are about to undergo treatments which may lead to infertility at an early age. This has allowed medical research to progress and in this case has allowed a young woman, who would have otherwise been infertile, to conceive naturally against all the odds. We wish the family all the best for the future."

Dr Nick Goulden, Medical Research Director, Children with Cancer UK, said, "The important news from the Edinburgh team, who have pioneered the development of this technology in the UK, offers further hope that re implanting ovarian tissue frozen prior to successful treatment for cancer can be used to preserve fertility after cure. This is particularly important in girls and young women receiving radiotherapy that affects the ovaries or high dose chemotherapy. The next few years will likely see further developments in this field including preservation of fertility in pre-pubertal boys. Children with Cancer UK is pleased to be supporting this pioneering work."

Statement from the mother

The mother, a 33-year-old from Edinburgh, who wishes to remain anonymous, said: "When I had the initial procedure to remove my ovarian tissue, it was very new and experimental. There was no guarantee that it would work and while I kept the possibility in the back of my mind, my husband and I never pinned our hopes on it being successful. It was hard to imagine

how well it could work, given that my tissue had been stored for such a long time and I had already had one round of chemotherapy before it was removed.

“That the re-implanted tissue took so quickly then, came as a really wonderful surprise. I’m incredibly appreciative of my oncologist’s foresight in sending me for the consultation with the fertility team. I had one small surgical procedure before I began my second round of chemotherapy and now, 10 years on, my husband and I have been able to have a family. We never thought it would be possible and we are just astonished and overjoyed. We are extremely grateful to all the people involved in this process.

“When you’re going through cancer treatment it can be hard to think about the future, but I do think this will offer hope to others that they could one day have a family.

“Because of my treatment I went through the menopause in my early 20s. Now that the tissue transplant has been successful, it's possible that I may not need to be on HRT for the rest of my life. That feels like a wonderful thing as well, besides all of the fertility implications.”

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