Gamete Intra-Fallopian Transfer (GIFT) [1]

By: Gilson, Hilary Keywords: Reproductive assistance [2]

Various techniques constitute assisted reproduction, one of which is gamete intra-fallopian transfer (GIFT). The first example of GIFT involved primates during the 1970s, however, the technology was unsuccessful until 1984 when an effective GIFT method was invented by Ricardo Asch [4] at the University of Texas Health Sciences Center [5] and the procedure resulted in the first human pregnancy [6]. The GIFT technique was created in hopes of generating an artificial insemination [7] process that mimicked the physiological sequences of normal conception [8]. The technique was further advanced at the Center for Reproductive Health at the University of California [9], Irvine, when Asch and his associate Jose Balmaceda [10] employed a newly developed catheter into the GIFT procedure that eliminated the need for general anesthesia in the later stages of the procedure.

On average, the GIFT cycle takes four to six weeks before fertilization [11] occurs. Women undergoing GIFT begin the procedure with hormonal treatments similar to patients undergoing *in vitro* [12] fertilization [11] (IVF). The hormonal treatments are administered in order to promote the development of oocytes, which are the precursor to eggs stored in the ovaries. For the highest chance of success with GIFT, fully mature eggs are essential. The male's sperm [13] is also manipulated in order to promote sperm capacitation [14] so it is primed to fertilize the egg [15]. Once the sperm [13] is capacitated, 100,000 to 500,000 motile sperm [13] are utilized in the GIFT procedure. For the highest chance of success with GIFT, an estimated 1.5 million sperm [13] should be motile with at least thirty percent having normal morphology [16].

The GIFT process begins by obtaining the father's semen [17] two hours before the mother undergoes a laparoscopic procedure to harvest her eggs. A small incision is made near the woman's navel and her eggs are harvested with the use of a fiber-optic viewing device known as a laparoscope. Once the sperm [13] and eggs are collected from both parents, they are immediately placed in the woman's fallopian tubes [18] through a catheter. The catheter contents are separated by air to prevent fertilization [11] prior to the transfer. Depending on the patient's age and the maturity of the oocytes, two to five oocytes are transferred into the fallopian tubes [18] along with the sperm [13]. The transfer of multiple oocyctes carries the possibility of multiple pregnancies, which occurs in an estimated thirty percent of assisted reproductive pregnancies. After the sperm [13] and oocytes are delivered to the woman's fallopian tubes [18] and consequently mix, the hope is that the resulting embryo or embryos will divide normally, move down to the uterus [19] to implant, and result in a healthy live birth.

The GIFT procedure is considered to be very similar to the process of normal conception [8] since fertilization [11] occurs within the woman's body. Because the GIFT procedure closely resembles natural or unassisted reproduction, it is one of the few reproductive technologies approved by the Vatican: no decisions are made as to which embryos are implanted or discarded, the embryo itself is not manipulated, and fertilization [11] occurs naturally *in vivo* [20] rather than artificially *in vitro* [12]. However, one point of contention with Catholic doctrine results from obtaining sperm [13] through masturbation.

GIFT is a viable [21] treatment for infertility [22] caused by certain ovary [23] disorders, endometriosis [24], and cervical problems, but it does not treat women with untreated fallopian tube blockages. GIFT requires at least one healthy fallopian tube, whereas treatments such as *in vitro* [12] fertilization [11] do not. Results of GIFT vary depending on the age of the patients and the quality of the sperm [13]. Women have decreased fertility odds and increased miscarriage [25] risks with increasing age, and most successful cases are with women thirty-five years of age or younger. The GIFT technique is generally more expensive and more invasive than IVF because the former requires surgical procedures. According to the 2004 report from the Center for Disease Control and Prevention on Assisted Reproductive Technology, GIFT is the least selected technique with only one percent of 94,242 couples undergoing the procedure. Of the one percent of couples undergoing a GIFT procedure, twenty-three percent result in a live birth.

Although GIFT is seldom chosen among the different assisted reproduction techniques, it remains an option for treating infertility [22]. GIFT is one artificial insemination [7] technique that is accepted by the Vatican, making this technology an appropriate choice for patients abiding by certain religious doctrines. Drawbacks of GIFT are that there is no diagnostic test to determine whether fertilization [11] has occurred and there is an increased chance of having an ectopic pregnancy [26]. Although GIFT is generally more invasive than traditional IVF, it constitutes one of many choices in pursuing assisted reproductive technology [27].

Sources

1. Brody, Steven, and Robert Geoffrey Edwards. *Principles and Practice of Assisted Human Reproduction*. Pennsylvania: W. B. Saunders Company, 1995.
2. Burfoot, Annette. *Encyclopedia of Reproductive Technologies*. Colorado: Westview Press, 1999.
3. Gilbert, Scott, Anna Taylor, and Emily Zackin. *Bioethics and the New Embryology.* Virginia: W. H. Freeman & Company, 2005.
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[2] https://embryo.asu.edu/keywords/reproductive-assistance
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