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## THE MATCH - DAY 3 - CHAPTER 3: OVARY REMOVAL

### HELPING PRESERVE FERTILITY

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Katie Trebing is believed to be the youngest girl to have an ovary removed and frozen for future use.

Ovarian cryopreservation has been done for about a decade. The first - and so far only - birth in the United States after ovarian tissue was removed, frozen and later reimplanted, occurred in September 2005, to Ann Dauer, then 33. She had a baby girl she named Sienna. Dauer surprised doctors by getting pregnant naturally after the reimplantation.

#### Keeping her 'dreams alive'

"Being a mom is the coolest gift you can ever get," said Dauer, who lives near Syracuse. Being able to freeze her ovary gave Ann hope during her stem-cell transplant to fight non-Hodgkins lymphoma in 2002. After her ovary was removed and frozen, she said she would lie in the hospital bed thinking, "I've done every step I can to keep all my dreams alive."

Dr. Kutluk Oktay, the fertility specialist at New York-Presbyterian/Weill Cornell Medical Center in Manhattan who froze Katie's ovary, also was the doctor who froze Dauer's. To date, Oktay has frozen ovaries from about 90 women, he said. He called ovary cryopreservation a "burgeoning technology."

Dauer's daughter was the second such birth in the world - the first was in Belgium a year earlier. There's been one more documented, in Israel in 2005. About nine other women have had their ovaries re-implanted. Half of them have tried to have children but haven't yet been successful, Oktay said.

#### A promising option

The perfection of ovarian cryopreservation and subsequent reimplantation is important to women diagnosed with cancer, blood diseases or other disorders that require radiation and chemotherapy, which can cause infertility. If they can have an ovary removed before the eggs are damaged, they might later have biological

children.

Oktaý found it disturbing that, while doctors could cure a woman of cancer, they would leave her infertile.

"It didn't make sense to me that while we were treating a woman for one thing, we would leave her severely disabled - and infertility is a disability," Oktaý said. Oktaý also is working on ways to protect women's ovaries during chemotherapy to eliminate the need for ovary removal.

Though ovarian cryopreservation was meant for cancer patients, it could in the future open up opportunities for all women - healthy women who want to delay childbirth could have an ovary frozen while still young and fertile, suspending the aging of the eggs.

### Beating the biological clock

"If our method works, a young woman, age 21 and entering law school or journalism school or medical school, could cryopreserve her ovary for later use," said Teresa Woodruff, the Thomas J. Watkins Professor of Obstetrics and Gynecology at the Feinberg School of Medicine at Northwestern University in Chicago. "Rather than take a chance with the biological clock, you could cryopreserve your ovary and use it when you are ready. You would be your own egg donor."

While doctors have advanced the freezing technique, which originated in England, they are still working on the best way to reimplant the ovary so it might produce a pregnancy years down the road.

Woodruff and her team are working on maturing eggs in the laboratory. The matured eggs would be fertilized in a petri dish and the embryo implanted into the woman's womb.

In this case, the benefit - in addition to eliminating the need for women to take certain fertility medications and have implantation surgery - would be that cancer patients wouldn't risk reintroducing cancerous cells into their systems along with the reimplanted ovary.

Woodruff was recently awarded a \$21 million grant from the National Institutes of Health to continue her work on preserving fertility in cancer patients.

As with all innovative medical technologies, there is an element of the unknown in ovarian cryopreservation that concerns some bioethicists.

When individuals try most new treatments, they are risking only their own health.

But when they try new reproductive technologies, they impose that risk on their offspring, said Alta Charo, professor of law and bioethics at the University of Wisconsin. No data yet exists on implications for a child born of a frozen ovary.

"When you, the adult, accept there is risk, it's really your child who will share the burden of those risks," Charo said.

In Dauer's case, Oktaý reimplanted her ovary in her groin. He had planned to extract eggs with a needle and do

in vitro fertilization. But Dauer surprised Oktay by conceiving naturally. The transplanted tissue "jump started" the ovary left inside Dauer, Oktay theorized, taking her out of premature menopause and restoring fertility.

## SAVING HER OVARY

Though it would help save her life, the chemotherapy Katie undergoes could damage her ovaries, preventing her from having children. To save one ovary, doctors removed it through her belly button and preserved it.

1 OVARIES CUT: After it is surgically removed, the ovary is sliced into tiny slivers about the size of grains of rice.

2 READY FOR FREEZING. Each sliver is soaked and packed with an anti-freeze substance to prevent ice from forming and damaging the eggs during the freezing process.

3 PRESERVED FOR FUTURE. Ovary pieces are frozen and stored in cryo-preservation. When Katie is ready to have kids, the ovary pieces are implanted in its normal location or in the forearm or abdomen. Eggs would be extracted and fertilized in vitro.

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