

Delaware Valley Institute of Fertility & Genetics Conceptions

Spring 2001

SONOGRAPHY AND YOU

As ultrasound improves, the possibilities are endless for helping infertile patients conceive.

By Laurie Miller, DVIFG Staff Sonographer

Ultrasound is the primary imaging modality used to evaluate the female pelvis. Sonographic diagnosis and management for the infertile patient have improved within the last decade due to the introduction of endovaginal transducers, as well as color and pulsed Doppler technology. As ultrasound evolves and medical professionals learn of new techniques to utilize it, the possibilities for the future are endless.

Most endovaginal transducers available today operate between 5 to 7.5 MHz. The higher the frequency, the better the resolution. A diagnostic, baseline pelvic ultrasound is used to evaluate the size of the uterus, and any abnormalities, including myomas (fibroids), malformations (bicornuate, unicornuate, septate), or abnormal appearance of the endometrium. The endometrium should appear as a thin, white line down the center of the uterine cavity without focal thickness (which may indicate a polyp). The endometrium should also appear without interruption. If the endometrium is not visualized well, or is pushed away from the center of the uterus, this may indicate a fibroid. The ovaries are evaluated for baseline follicles and size and screened for ovarian masses or the appearance of polycystic ovarian syndrome (PCOS). Polycystic ovaries are usually larger in size than normal. They also tend to have multiple follicles measuring less than 8mm arranged around the outer border in a "ring of pearls" pattern. All baseline ultrasounds are performed on the second or third day of the menstrual cycle.

During an infertile woman's evaluation, ovarian masses may be discovered. Most often these prove

to be functional follicular cysts or corpus luteum (post ovulation) cysts. However, other pathology, such as endometriomas, dermoids or malignant neoplasms can be discovered. What's inside these ovarian masses and their size are very important. A benign cyst is usually round with smooth borders and has few or no septations (solid components). A benign cyst usually will move when touched.

Pulsed and color flow Doppler have been at the forefront of screening for malignancy. Suspicious masses demonstrate increased, low resistant blood flow, especially within the center of the lesion. If there's no blood flow or if the blood flow is located around the borders of a mass, it usually indicates a benign process. Color flow Doppler improves the visualization of blood flow by "color tagging" moving blood cells. If there is an increase in blood flow in a certain area, the ultrasound screen will light up with colors tagged to show forward and reversed blood flow. Different color tag menus can be chosen, and the operator can choose the range of velocities screened. Pulsed Doppler is audible and displays a variable, flow velocity waveform on the ultrasound screen. Pulsed Doppler measurements used in ovarian evaluation are referred to as the PI (pulsatility index) and the RI (resistive index). Researchers have discovered that particular values of these measurements are helpful in diagnosing a malignant mass versus a benign process. Detection of increased vascularity and the characterization of specific waveform patterns help provide specific diagnosis not possible with gray scale ultrasound alone.

Prior to ovulation (around day 14 to 16 of a woman's cycle) the mature follicle measures 20 to 24mm. Color and pulsed Doppler examination in the mature follicle demonstrates a rim of increased



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vascularity (blood flow) surrounding the follicle. This increased blood flow "ring of fire" may be seen as early as day eight and may persist through day 24 and into early pregnancy. The endometrium appears triple layered, referred to as trilaminar and measures approximately 9 to 14 mm.

Following ovulation (day 17 to 22 of a woman's cycle) the endometrium changes from trilaminar to a thickened, white stripe, and measures the same or slightly less than it did immediately prior to ovulation. A corpus luteum, (or ruptured follicle) is also usually seen. Color flow Doppler demonstrates the ring of increased blood flow around the walls of corpus luteum, and can be especially helpful if the corpus luteum has bled into itself from releasing the ova (egg) and is difficult to visualize.

When pregnancy is achieved, ultrasound provides confirmation of an intrauterine gestation or gives clues of an abnormal pregnancy. Approximately 35 days after the last menstrual period, it is possible to visualize a small gestational sac within the endometrial cavity, usually less than 4 mm. Within one week, a yolk sac should be seen. A developing pregnancy is confirmed when the yolk sac is seen.

An ectopic pregnancy (a pregnancy outside the uterus) combined with an intrauterine pregnancy is rare (1 in 30,000 cases). In patients undergoing ovulation induction, the incidence of ectopic pregnancy in addition to an intrauterine gestation is 1 in 6,000 cases. Using color flow Doppler techniques, it is possible to highlight a suspicious area for an ectopic by observing blood flow in the region of the fallopian tubes. If an intrauterine gestational sac with a yolk sac is not visualized, but the pregnancy hormone bHCG is positive and the value is greater than 1500, it may indicate that an ectopic pregnancy may be developing.

The embryo should be evident by the end of the fifth menstrual week, and embryonic cardiac activity should be observed by the end of the sixth week. Once cardiac activity is visualized, it should always be seen from then on. Limb buds are apparent by eight weeks, and the jaw and early brain anatomy can be seen by the 10th week.

There also is a rising interest in the role of color Doppler evaluation of the early embryo and developing placenta. The information we can gain studying the vasculature of the early gestation can help us understand intrauterine fetal growth restriction (poor fetal growth), prematurity, and fetal loss.

Because a healthy pregnancy implants and develops within the endometrium, a complete evaluation of the endometrium throughout the cycle is imperative. Sonohysterography is the latest technique used for this purpose. The procedure entails placing a balloon catheter within the uterine cavity.

Once the balloon is inflated slightly to prevent leakage, sterile saline is injected through a small tube to fill the endometrial cavity. To demonstrate abnormalities of the endometrium, such as polyps or intracavitary fibroids, the endometrial layers are separated. The contour of the inside of the uterus is also more evident. The saline window also makes it possible to identify malformations, such as bicornuate or a uterine septum.

Ultrasound is our crucial diagnostic tool in the workup and management of the infertility patient. At DVIFG we are pioneering new techniques to gain the information we need to achieve our goals and assist our patients.

If you have any questions or concerns regarding ultrasound technology or examination, please contact me at (856) 988-0072.



Laurie Miller recently joined the DVIFG staff. A highly skilled, board-certified sonographer with 14 years of experience in the field, Ms. Miller served as staff sonographer for the division of Maternal Fetal Medicine at Cooper University Hospital before joining DVIFG. She received her BS degree from the Thomas Jefferson College of Allied Health Sciences and also has experience in general ultrasound and other OB/GYN subspecialties.

Ms. Miller is pictured here with DVIFG's new LOGIQ™400 ultrasound imaging system. This state-of-the-art machine has the capacity to help diagnose many high-risk pregnancy conditions, including placenta abnormalities, multiple pregnancies, and many other important conditions concerning infertility, including the appearance of the endometrium and the appearance and amount of follicles.



“Nothing in life is to be feared. It is only to be understood.”

— Marie Curie

NEWS You Can Use

BEWARE OF CERTAIN FISH.

The Food and Drug Administration (FDA) has issued a warning regarding fish intake. Women that are trying to conceive, pregnant women, nursing mothers, and young children should not eat shark, swordfish, king mackerel, or tilefish. These fish contain high levels of methylmercury that can damage developing nervous systems.

LIFESTYLE CHOICES AND INSULIN RESISTANCE.

There's renewed hope for infertile women with insulin resistance and other metabolic disorders, according to a recent study conducted by Chung H. Wu, M.D., FACOG,

director of DVIFG's Syndrome X Early Detection and Treatment Program. Dr. Wu treated 83 patients with insulin resistance (IR), impaired glucose tolerance (IGT), or diabetes mellitus (DM) for 3 to 12 months using lifestyle adjustments, and in some cases, with insulin sensitizing agents. The lifestyle adjustments included eating a low carbohydrate/low fat diet, reducing stress through stress management techniques, exercising regularly, and taking multivitamins, extra Vitamin C, Vitamin E, and Omega-3 fatty acids.

During one year of follow-up therapy, 78.3 percent of the participants achieved pregnancy, comparable to patients without metabolic disorders. Moreover, 75.8 percent of the patients lost weight, with 66.1 percent lowering their weight by 10 percent or less.

Obese women and women with high levels of stress are often insulin resistant, a condition that can lead to Polycystic Ovarian Syndrome (PCOS), a major cause of infertility. Dr. Wu's study shows that a program emphasizing weight loss and stress management may play a significant role in the long-term success of correcting IR and even PCOS. (For more on Dr. Wu's research, please turn the page.)

CAFFEINE CAN AFFECT MISCARRIAGE RISK.

Nonsmoking pregnant women who drink more than one cup of coffee or two cups of tea per day increase their risk of suffering a miscarriage (spontaneous abortion), according to a recent Swedish study published in the *New England Journal of Medicine*.

Researchers from Uppsala County, Sweden found that the risk increased in relation to the amount of caffeine ingested above the 100 mg recommendation. Based on their study and others, the researchers concluded that drinking one cup of coffee or two cups of tea per day is safe for pregnant women. Pregnant women also should watch their intake of soft drinks, tea, and chocolate, which all contain caffeine.

ASK THE DOCTORS

Q: Is there any evidence that depression may inhibit fertility?

A: According to a recent study published in *Fertility and Sterility*, there may be a link between depression and infertility. The women that participated in a support group designed to reduce their depression experienced enhanced conception. Those choosing to receive support from a psychologist for their depression also achieved enhanced conception.

Like most other things in life, there is no “one-size-fits-all” solution. An individual must determine if a support group can play a positive role in her life. Some women may prefer a support group with only peers, while a support group led by a professional counselor may help others more.

The Delaware Valley Institute of Fertility & Genetics (DVIFG) has been helping patients cope with the uncertainty of infertility for a decade. Through a unique program designed to help individuals and couples discuss and work through their feelings and concerns, they learn effective strategies to live each day to its fullest while trying to conceive.

Geoffrey D. Nusbaum, Ph.D., directs DVIFG's Medical Psychotherapy and BioMedical Ethics Service. A Fellow and Diplomat of the American Board of Medical Psychotherapy and a Fellow of the International Council of Sex Education and Parenthood at American University in Washington, DC. Dr. Nusbaum holds a clinical certificate from The American Association for Marriage and Family Therapy and is a Founding Member of the Mental Health Issues Group of the American Society for Reproductive Medicine. He has over 25 years of experience counseling people on how to deal with the stress associated with a medical condition, including infertility.

To make an appointment with Dr. Nusbaum, please call (856) 988-0072.

Look for more “Ask the Doctors” questions and answers on our web site at: www.startfertility.com



Conceptions is published quarterly for a select group of OB/GYNs and their patients. To receive extra copies of the newsletter or to be placed on our mailing list, please call Carla Scott at (856) 988-0072 or e-mail her at: info@startfertility.com.

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Happy Birthday to . . .



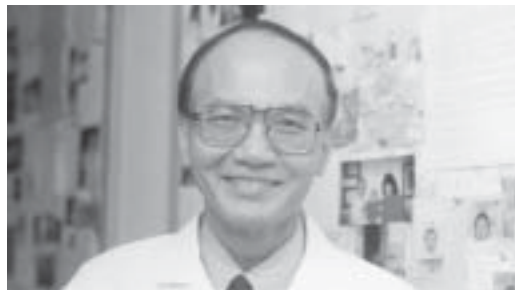
- Hailee Marie Traenkner**, born on November 2, 2000, to Lauren and Michael Traenkner.
- Radames Michael Morales**, born on November 3, 2000, to Lucy and Radames Morales.
- Brooke Getler**, born on November 11, 2000, to Lisa and Paul Getler.
- Kylie Nicole Cribben**, born on November 12, 2000, to Beth and Dennis Cribben.
- Alexis Faith Hutson**, born on November 24, 2000, to Mary Ann and David Hutson
- Jeffrey Robert Sheets**, born on November 28, 2000, to Tracey and Jeffrey Sheets.
- Janie Michelle Emery and Jeanie Marie Emery**, born on January 2, 2001, to Kathleen and Frank Emery.
- Sophie Rose Olschewski**, born on January 9, 2001, to Kelley and Tom Olschewski.
- Jack Werrell**, born on January 11, 2001, to Sandra Werrell.
- Giana Grace Favilla**, born on January 23, 2001, to Donna and Dan Favilla.
- Jake Brian Gugliemi**, born on January 24, 2001, to Brian and Brittney Gugliemi.
- Luis Daniel Cruz**, born on February 1, 2001, to Kim and Luis Cruz.

Rachel Louise Panetta, born on February 26, 2001, to Nancy and Dan Panetta.

Rachel Flynn, born on April 3, 2001, to Sue and Kevin Flynn.

Matthew Thomas Dwyer, born on April 11, 2001, to Susan and Paul Dwyer.

All the babies and parents are doing well. Thank you, DVIFG!



In March, Chung H. Wu, MD, FACOG, presented his research findings to colleagues at the Society for Gynecologic Investigation in Toronto, Canada. Dr. Wu shared the results of his study entitled, "Therapeutic Outcome of Infertile Patients With Insulin Resistance." (For details of the study please see, "Lifestyle Choices and Insulin Resistance" on page 3.)

Dr. Wu directs the Delaware Valley Institute of Fertility & Genetics (DVIFG) Syndrome X Early Detection and Treatment Program and is a member of the Cooper Health System's OB/GYN Department and the Virtua Health System's OB/GYN Department. As a professor of Obstetrics and Gynecology and a researcher in Reproductive Endocrinology and Infertility at the UMDNJ-Robert Wood Johnson Medical School, Dr. Wu has been at the forefront in educating the medical profession about lifestyle choices and insulin resistance, a leading cause of infertility and other health problems.

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