Prenatal Ultrasound (continued)

a genetic ultrasound image. Ultrasonography is also extremely useful in the prenatal detection of heart defects. As with Dr. Fleming and genetic ultrasound, Dr. Barsoom's experience in evaluating the fetal heart using ultrasound gives him the ability to detect prenatal cardiac problems, including abnormalities of cardiac structure, cardiac rhythm disturbances, or disorders of cardiac function.

Dr. Barsoom's experience in evaluating the fetal heart using ultrasound gives him the ability to detect congenital cardiac anomalies.

Intrauterine Transfusion for Rh Incompatibility

When an Rh-negative mother is first exposed to her Rh-positive baby's blood due to a fetomaternal hemorrhage or an event such as a normal pregnancy and delivery, her immune system will treat her baby's blood cells as a foreign antigen and she will develop antibodies against it. If these antibodies are of sufficient quantity in a subsequent pregnancy, they can cross the placenta and bind to the baby's red blood cells. This can then cause the baby to hemolyze its own blood, resulting in severe anemia, which in turn can result in heart failure and if undetected and untreated, fetal death. If these antibodies are identified in the mother, maternal-fetal specialists can monitor their babies using middle cerebral artery Doppler. If anemia is identified, Creighton University Medical Center's Center for Maternal-Fetal Medicine is one of only a few centers in the Midwest that performs intrauterine blood transfusions to treat maternal-fetal redcell incompatibility due to isoimmunization. Dr. Barsoom uses ultrasound to guide the needle through the mother's abdomen into the fetus's umbilical vein, transfusing the fetus with Rh-negative blood. The procedure is performed with the mother sedated. Typically this procedure is performed around the 20th week of pregnancy, but it can be done as early as the 17th week. Multiple transfusions are typically necessary to sustain the fetus' hematocrit until delivery.

Dr. Barsoom performs intrauterine transfusion for Rh incompatibility multiple times a year.

Vesicoamniotic Shunting for Posterior Urethral Valves

Posterior urethral valves (PUV) are the most common cause of male pediatric obstructive uropathy, a condition in which the fetus is unable to void urine into the amniotic cavity, which can in turn result in renal failure, poor lung development, and fetal death.

One method the maternal-fetal specialists at Creighton University Medical Center employ is the vesicoamniotic shunt. This is a closed fetal surgical procedure in which a tube is placed in the baby's bladder to drain urine into the surrounding amniotic space. The procedure is performed under epidural anesthesia with ultrasound guidance. A trocar is inserted through the mother's abdominal and uterine walls into the amniotic cavity and subsequently into the bladder of the fetus. A catheter is inserted through the trocar and positioned with one end in the bladder and the other in the amniotic cavity. The trocar is then removed and the final position of the catheter confirmed by ultrasound. When correctly placed, this allows the urine to be excreted into the amniotic cavity, hopefully restoring the amniotic fluid index to normal and preventing pulmonary hypoplasia. Occasionally the procedure needs to be repeated, as the catheter can become displaced as the fetus grows.

This is a closed fetal surgical procedure in which a tube is placed in the baby's bladder to drain urine into the surrounding amniotic space. The procedure is performed under epidural anesthesia with ultrasound guidance.

To speak with one of Creighton University Medical Center's Maternal-Fetal specialists or to refer a patient, contact Creighton-On-Call at 877-775-0011.

THE CENTER FOR MATERNAL-FETAL MEDICINE AT CREIGHTON UNIVERSITY MEDICAL CENTER

Creighton UNIVERSITY Medical Center

Maternal-Fetal
CONSULTANT

February 2010

Biochemical Screening Increases the Detection Scope of Amniocentesis

In this day and age, the goal is to reduce the risk of miscarriage or fetal injury by only performing amniocentesis when indicated by an abnormal result on a non-invasive screening.

The Center for Maternal-Fetal Medicine at Creighton University Medical Center is staffed by maternal-fetal medicine specialists, nurses, neonatologists and support personnel who are specially trained in the management of high-risk pregnancy. As a Jesuit-affiliated facility, Creighton University Medical Center is dedicated to the concept of Cura Personalis – care for the whole individual. This means not only managing a high-risk pregnancy medically, but also taking into account psychosocial and spiritual factors.

For many years it was standard practice to recommend an amniocentesis for any pregnant woman over the age of 35. While this is no longer the case, there are still physicians who use age as a determinant for recommending the procedure, which carries with it a small risk of fetal injury or miscarriage.

The primary problem with screening based on maternal age is that this only detects approximately one in two babies with Down syndrome. This is because only about 50% of babies with the extra 21st chromosome that causes the syndrome are found in women over the age of 35, while the other 50% of affected babies are born to women younger than 35. The other issue is that 99.2% of women age 35 and older have normal children. Amniocentesis is one of the diagnostic tests that can detect chromosomal abnormalities such as Down syndrome. This procedure is performed by the maternal-fetal medicine specialists at Creighton University Medical Center's Center for Maternal-Fetal Medicine.

In this day and age, the goal is to reduce the risk of miscarriage or fetal injury by only performing amniocentesis when indicated by an abnormal result on a non-invasive screening. According to Michael Barsoom, M.D., FACOG, Associate Professor of Obstetrics and Gynecology and Director of the Division of Maternal-Fetal Medicine, non-invasive tests such as the quad screen and the sequential screen should be done regardless of maternal age. These screening tests are extremely useful in reducing the number of amniocenteses performed by selecting the appropriate patients, those most likely to be carrying an affected fetus. These screening tests come back positive 5% of the time. By using these screening tests, we can identify 80 to 90 percent of babies with Down syndrome. As Dr. Barsoom states, "Why should a woman have an amnio if there are other non-invasive tests available to determine if the pregnancy is at risk for being affected with Down syndrome, especially when those tests are much better at predicting it than by simply asking, 'how old are you?'" Additionally, the true strength of these tests is the negative predictive value, where a negative test correctly identifies a normal, unaffected fetus in 99.7% of cases.

Prenatal Ultrasound Detects Genetic and Cardiac Abnormalities

Alfred Fleming, M.D., FACOG, is renowned for his ability to read a genetic ultrasound image.

The use of ultrasonography to detect specific physical markers in the fetal anatomy that may indicate Down syndrome is typically referred to as a "genetic" ultrasound. Certain physical characteristics can be seen more frequently in fetuses with Down syndrome when compared to normal fetuses, such as nuchal fold thickening or a shortened humerus or femur length. These can be detected by the careful study of a detailed ultrasound of the fetus. These ultrasound findings are then combined with biochemical screening results to give parents a risk assessment for aneuploidy, which they can then use to decide whether or not to have an amniocentesis. The critical factor in reducing false positives and arriving at a correct analysis is the experience of the person manipulating the transducer and analyzing the ultrasound image. At the Center for Maternal-Fetal Medicine, Alfred Fleming, MD, FACOG, Professor and Chairman of the Department of Obstetrics and Gynecology at Creighton University School of Medicine, is renowned for his ability to read

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