Ultrasound in Pregnancy

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Ultrasound examination or ultrasonography is a high technology imaging study to detect the human structure or internal organ abnormalities. It is not some kind of radiation or X-ray but it works like sonar in submarine by sending high frequency of sound waves through the body. The sound will echo off of the body structures in a different density depending on the complexity of the objects and the computer will convert the echoes into images or pictures. Ultrasound had been developed and used in medicine for more than 30 years, not only for diagnosis but also for assessment of the extent of the diseases as well as interventional therapy. Since the sound wave is not harmful to the fetal development, ultrasound is very useful in pregnancy to determine some abnormalities that clinical assessment may be missed with the hope to improve the maternal and neonatal outcome. Therefore ultrasound is becoming an integral part of the prenatal care in most part of the world.

The importance of ultrasound is not just only to look for the gender of the future child as requested by those curious parents or advertised by some private hospitals. The gender finding is just a supplementary service. The main benefits of the ultrasound are; 1) to determine the gestational age in women with uncertain menstrual dates, 2) to detect multiple gestations such as twins or triplets, 3) to detect the congenital anomalies, fetal growth retardation and tumor, and 4) to detect the breech and other malpresentations as well as the placenta appearance. These conditions may be associated with increased maternal or perinatal morbidity and mortality. Inaccurate estimation of gestational age may lead to an induction of labor in pregnancies erroneously thought to be postterm. Multiple gestations are associated with increase perinatal mortality, preterm delivery and other obstetric complications and it is more likely to result in cesarean delivery. Malpresentations may be associated with poor outcome and also result in cesarean delivery in 84% of cases. It occurs in 38/1,000 live births, with the risk increasing with increasing age of the mother.

As a consequence, is it necessary to do a screening ultrasound in all pregnant

women? According to Dr. Tuangsit Watagnara, from Division of Maternal-Fetal Medicine, Department of Obstetrics and Gynecology, Faculty of Medicine Siriraj Hospital, he encourages all pregnant women to have at least one ultrasound done in the second trimester or at 16-20 weeks gestation. However if the women are affordable, the first ultrasound should be done as early as possible in the first trimester to assess the gestational age, (if there is indication), by measuring the gestational sac when the fetus is not well formed, or measuring head circumference, biparietal diameter or femur length. The second ultrasound should be carried out at 16-20 weeks as stated earlier to examine both gestational age and the fetal abnormalities after all important structures had been fully developed such as heart diseases, brain and spinal cord diseases, abdominal wall defect, cleft lips, cleft palate and genito-urinary system defects, etc. If such an anomaly is quite lethal, legal termination of pregnancy is possible. The third ultrasound will be done in the third trimester to determine if the baby is healthy, with good movement, heart function and placement in uterus.

As recent advances in the field of maternal-fetal medicine, new interventional therapy with ultrasound guided had been developed such as fetal therapy. Dr. Tuangsit explains one of such a procedure is the use of intrauterine fetal transfusion or percutaneous umbilical cord blood transfusion to prevent the complication of Rh (red blood cell) isoimmunization by inserting a small needle from the abdominal wall to the uterus, to amniotic sac and umbilical vein respectively.

EXIT procedure or ex utero intrapartum treatment is another newly developed method performing when the baby is partially delivered via cesarean section. The baby is evaluated and treated while on placental support (still attached to the umbilical cord). This method is usually employed when the fetus suffers from a congenital defect or tumor that block the airway, such as teratoma, EXIT gives surgeons time to do the things that secure the baby's airway before the cord is cut.

In spite of the improvement of technology and refinement in visualization, the key success in the accuracy of diagnosis is the expertise of the ultrasonographers. Ultrasound examination is a procedure of operator dependent. Ultrasonographer should be trained and casual use of ultrasound in pregnancy should be avoided.

Lastly, any physicians who are interested in this field of medicine, The topic of

“Role of 3D and 4D ultrasound in obstetrics” will be presented on July, 6, 2005, in the 45th Siriraj Scientific Congress, at Royal Thai Navy Conference Hall. All are welcome and registration is available on site.