3-D Fetal Ultrasound Can Help With Counseling

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KAILUA KONA, HAWAII — Three-dimensional ultrasound is less helpful for diagnosing fetal abnormalities than for counseling patients, Dr. Dolores H. Pretorius said at a conference on obstetrics, gynecology, perinatal medicine, neonatology, and the law.

Always performed as an adjunct to two-dimensional prenatal ultrasound, never as a replacement for it, 3-D ultrasound can help visualize and evaluate certain fetal abnormalities, give clinicians more confidence about what they're identifying, and help explain the problem to patients, she said.

Rarely does 3-D ultrasound identify additional abnormalities, said Dr. Pretorius, professor of radiology and director of imaging at the University of California, San Diego.

The most helpful medical use of 3-D ultrasound may be for imaging facial anomalies, especially small cleft lips and cleft palates that are difficult to see with 2-D ultrasound, according to a 2005 consensus panel convened by the American Institute of Ultrasound in Medicine.

Because 3-D ultrasound can provide consistent symmetrical views, unlike 2-D ultrasound, it may help diagnose micrognathia (small chin), but further research is needed to confirm that, she said at the conference, which was sponsored by Boston University. It also may be helpful for imaging brain and spinal anomalies, identifying sutures on the fetal skull, and for research studies of cardiac anomalies, the consensus panel suggested.

Anomalies of the ear or the extremities can be seen with 3-D ultrasound. A diagnosis of club feet by 3-D ultrasound is false 12%-22% of the time, however, so patients must be warned of the false-positive rate, she cautioned. "We've had patients terminate the pregnancy for club feet and then have normal feet at autopsy."

Referrals to check for central nervous system anomalies include cases of craniosynostosis or of mild ventriculomegaly, to look for the corpus callosum. A 3-D ultrasound of a neural tube defect can localize the level of the defect. "Most of the time this does not impact patient care" except when surgical treatment is planned, she said. Scoliosis is much more apparent on 3-D than on 2-D ultrasound to the parents and clinicians.

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Trying to get parents to understand a fetal movement disorder can be difficult with just a 2-D image of an outstretched arm. Show them a 3-D image, however, "and all of a sudden the light bulb goes off in their head and they can understand it. Sometimes for patients the visual appearance of these can be very helpful," Dr. Pretorius said.

Parents love to see 3-D images of the fetal face, which has led some nonmedical businesses to offer controversial "entertainment" 3-D ultrasound services in shopping malls and elsewhere. "I've already seen several lawsuits coming through related to 3-D ultrasounds that missed anomalies. The key question is, did the patient know that this was for entertainment, not diagnosis?" said Dr. Pretorius, who has studied 3-D ultrasound for 17 years.

A 3-D exam can be a frustrating experience for sonographers. Even experts only manage to image the face in 80% of midtrimester fetuses and 50% of third-trimester fetuses. The fetus must be in the right position without anything obscuring the face, and with plenty of amniotic fluid around it. The results are affected by gestational age and other factors.

At the start of a 3-D exam, "there's no predicting whether I'm going to make a good picture or not. If the parents don't get a good picture, they think that I'm not a good doctor," Dr. Pretorius said.

As 3-D ultrasound gets used more and more, clinicians must become familiar with a slew of new imaging artifacts. To the untrained eye, a 3-D ultrasound may seem to show a fetus with a single nostril, or a black eye. Motion artifacts can simulate a cleft lip. Rendering artifacts can look like terrible ventriculomegaly. What seems to be a missing arm bone may be a shadow artifact. ■

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