Identification of Fetal Atrial Flutter by Doppler Tissue Imaging

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A 26-year-old woman presented at 33 weeks of gestation with a singleton fetus with tachycardia. A complete fetal echocardiogram revealed a structurally normal fetal heart without signs of hydrops. The fetal heart rate was between 200 and 220 bpm. Evaluation of the rhythm with pulsed Doppler and M-mode scanning was not definitive. Fetal Doppler tissue imaging color M-mode scanning was performed by placing the cursor across the atrium and ventricle and increasing the color tissue scale while decreasing the overall gain to optimize visualization of the tissue motion. A diagnosis of atrial flutter with 2:1 block was made (Figure 1). The mother was treated with digoxin and flecainide to control the flutter, without success. After documentation of fetal lung maturity, the mother underwent delivery. The newborn was noted to be in atrial flutter with 2:1 block (Figure 2) and was eventually cardioverted to normal sinus rhythm after failure of further medical treatment.

Fetal arrhythmias occur in 1% to 2% of all pregnancies. Current methods used to evaluate these rhythm disturbances during fetal echocardiography include M-mode and pulsed Doppler scanning. Because color facilitates visual interpretation in difficult cases, color M-mode Doppler tissue imaging can be an important adjunct to the usual imaging techniques in the differentiation of arrhythmias in the fetus.

Figure 1. Fetal color Doppler M-mode tracing of atrial flutter. Atrial contractions (A) are seen at bottom of tracing and ventricular contractions (V) in middle of tracing. One contraction-relaxation cycle is represented by blue and red signal. Two atrial contractions (at a rate of 440 bpm) are seen for every ventricular contraction (at a rate of 220 bpm), suggesting fetal atrial flutter with 2:1 block.
Figure 2. Postnatal color Doppler M-mode tracing of atrial flutter. Two atrial contractions (A) are seen for each ventricular contraction, as noted on ECG at top of screen.