

Simultaneous Recording of Maternal and Fetal Heart Rate

To the Editor:—I read with interest the letter to the editor, "Monitoring Maternal Heart Rate during Epidural Injection of a Test Dose Containing Epinephrine," by Chestnut and Weiner.¹ We tried to duplicate the technique using the same machine. It was difficult to do so for the following reasons: The electrodes are connected originally to a hook that is supposed to be attached to the fetal scalp; therefore, the wires have to be cut and their terminal ends exposed before being attached to the regular electrodes placed on the maternal chest. Subsequently, conductive gel has to be applied to the cable block, which is strapped to the patient's arm. Also, by using the fetal scalp electrodes, one may deny the fetus from being monitored during the procedure. The absence of fetal heart rate monitoring is evident in the figure in their correspondence.

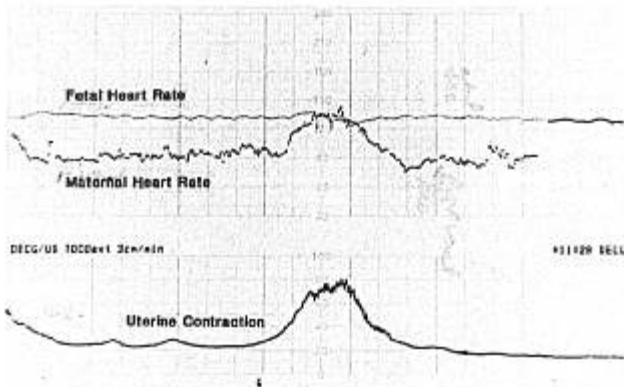


FIG. 1. Simultaneous recording of fetal heart rate by ECG (light tracing), maternal heart rate using Doppler (dark tracing), and uterine contractions. The heavy vertical lines are 1 min apart.

We hereby describe an easier way. Using the same machine (Hewlett-Packard Model 8040A), leave the internal monitor to record the fetal heart rate by ECG. At the same time place the Doppler component of the machine over major maternal arterial blood flow, *e.g.*, the aorta at the substernal angle. Thus, you can simultaneously record the fetal heart rate, maternal heart rate, and uterine contractions, as shown in figure 1. Also, we would like to draw attention to the fact that during a uterine contraction, the maternal heart rate can increase by 50% (approximately 40–50 beats/min), as shown in figure 1. This maternal heart rate acceleration in response to uterine contractions was one of the reasons we objected to the use of epinephrine as a test dose because of the possibility of a false positive result.² If you still prefer to use epinephrine, inject the test dose immediately after a uterine contraction.

EZZAT ABOULEISH, M.D.

Professor of Anesthesiology, Professor of Obstetrics and Gynecology

KERRY JOHNSON, M.D.

Resident of Obstetrics and Gynecology

*Department of Anesthesiology
The University of Texas
Houston, Texas 77030*

REFERENCES

1. Chestnut DH, Weiner CP: Monitoring maternal heart rate during epidural injection of a test dose containing epinephrine. *ANESTHESIOLOGY* 64:839–840, 1986
2. Abouleish E, Bourke E: Concerning the use and abuse of test doses of epidural anesthesia. *ANESTHESIOLOGY* 61:344–345, 1984

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In reply:—We appreciate the interest of Drs. Abouleish and Johnson in our recent correspondence. We regret the misunderstanding regarding the technique that we described. We have *not* used a fetal scalp electrode to monitor the maternal heart rate. Rather, we have used pregelled electrodes and electrocardioscope lead wires, such as those routinely used in the operating room. The

lead wires may be easily inserted into the cable block. Further, we have not found it necessary to apply conductive gel to the cable block.

Drs. Abouleish and Johnson have described use of the dual heart rate monitoring capability, an option that was not standard equipment on earlier editions of the Hewlett-Packard Model 8040A. This "twin option" is now a stan-