

MISINTERPRETATION OF FETAL HEART RATE MONITORING IN CASE OF INTRAUTERINE DEATH

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Misdiagnosis of fetal heart rate recording occurred very rarely, but in the advent of a dead fetus, conduction of the maternal electrical voltage could result in recording of maternal heart rate through abdominal cardiogram (1).

A recording of slow maternal heart rate could be misinterpreted as fetal distress (2).

Thus leading to the performance of an unnecessary cesarean section (3).

Conversely as we report here when intrauterine death is accompanied by maternal tachycardia, recording of a heart rate within normal limits may create a false sense of security (4).

CASE REPORT

A 25 years old gravida I para 0 was admitted to the labor ward at 30 weeks gestation, complaining of bloody vaginal discharge, loss of fetal movements and abdominal pains.

Pregnancy had been uneventful until admission. General physical examination revealed a slight ankle oedema with slight proteinuria. Blood pressure was 120/80, with normal fever.

The uterus was enlarged to 32 weeks, tender but no tonus was found. The cervix was 30% effaced, dilated to 1.5 cm, vertex was in station spina - 3 and unruptured membranes.

An external ultrasound transducer was used to monitor fetal heart rate (FHR) pattern (Hewlett Packard 8020-A).

Because fetal distress was suspected (fig. 1) the patient was promptly transferred to fetal intensive care unit where amnioscopy revealed turbid water.

An attempt to locate the FHR by ultrasound transducer and stethoscope failed, amniotomy was performed and a spiral electrode was applied to the fetus scalp. The rate obtained by the direct electrode showed wide beat to beat changes concomitant with regular recurring artifact (fig. 2).

The suspected diagnosis of fetal death accompanied with maternal ECG conduction was further confirmed by maternal radial pulse rate which was simultaneous with monitored abdominal heart rate.

A macerated male stillborn infant weighing 1700 was delivered vaginally.

The cord was about 40 cm length tangled around the infant's neck.

Autopsy examination revealed a macerated fetus with about three weeks retention and a large placental hemorrhage.

SUMMARY

Electronic fetal heart rate monitoring has become a routine examination to assess fetal well-being.

This report presents an unusual case in which maternal heart rate tachycardia was obtained from a dead fetus and was interpreted erroneously.

The dead fetus conducted maternal ECG even through a scalp electrode by amplifying the input signal through the Automatic Control system of the monitoring equipment.

The importance of concomitant maternal radial pulse recording or a real time scan is stressed.

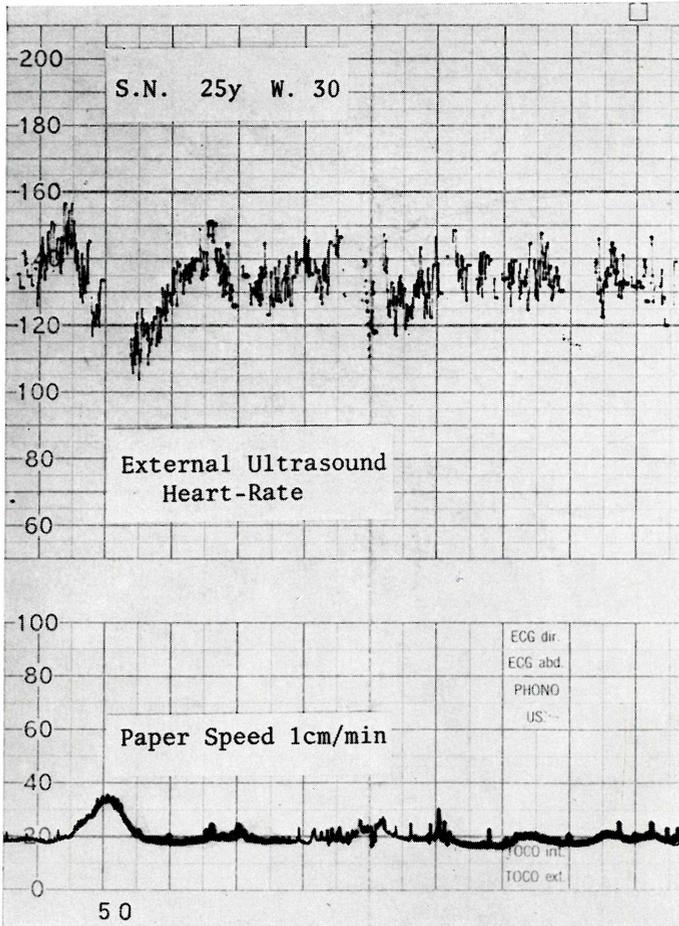


Fig. 1. — Maternal heart rate obtained by external ultrasound transducer, simulating deceleration pattern.

DISCUSSION

The external ultrasound technique for fetal heart rate is based on the doppler principle, detecting motion of a surface in relation to a transducer. Most direct monitors are equipped with automatic gain control devices which amplify input signal to levels sufficient for accurate counting of fetal heart rate monitoring. The fetus acts as a conductor for the low voltage maternal ECG.

When the fetus is dead automatic gain control amplifies the maternal ECG to high levels as simulating a regular fetal signal.

Few cases of maternal ECG conduction to the dead fetus were reported (5).

The most harmful erroneous diagnosis is that of a slow normal maternal heart rate which is misinterpreted as severe fetal bradycardia, leading to an unnecessary surgical intervention. On the other

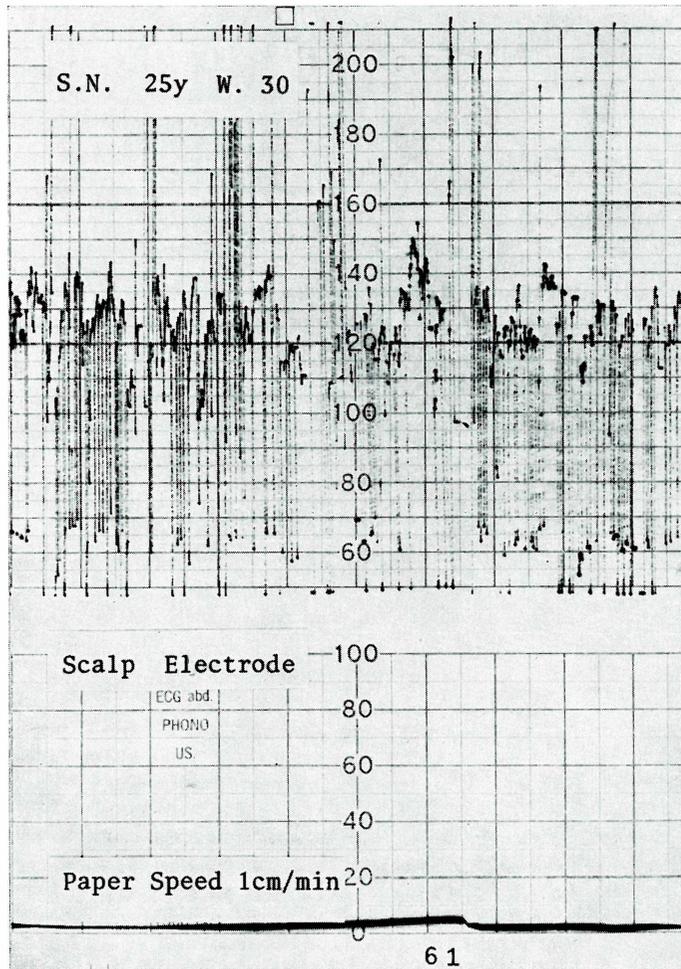


Fig. 2. — Maternal heart rate obtained by direct fetal scalp electrode. The instantaneous rate is irregular with wide beat to beat changes with recurring artifact.

hand, maternal tachycardia could simulate normal fetal heart rate resulting in erroneous diagnosis in a case of intrauterine death.

This indeed was the case of our patient.

The ultrasound transducer was placed over a large parasitic maternal vessel resulting in maternal pulse monitoring.

A combination of a few techniques may create a relatively safe diagnostic routine.

A real time ultrasound examination, which has been established in most delivery wards, a simultaneous maternal radial pulse detection concomitant with electronic fetal heart rate monitoring.

Use of direct fetal electrode can provide additional information about the origin of the ECG. A poor quality signal may indicate maternal origin.

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