



## **Indefinite Fetal Heart Rate Pattern in a Patient with Vasa Previa: A Situation Where Guideline Is Inapplicable**

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### **Abstract**

Most fetal heart rate patterns can be interpreted accurately so that management decisions can be made correctly. However, few fetal heart rate patterns are so ambiguous that the obstetricians cannot interpret them precisely. A 27-year-old woman at 38 weeks' gestation in her first pregnancy was admitted with heavy vaginal bleeding and decrease in fetal movements. Fetal status was indeterminate according to an indefinite fetal heart rate tracing with regular decelerations. After emergent cesarean delivery, a ruptured vasa previa, traversing the fetal membrane, unsupported by either the umbilical cord or placental tissue, was clearly identified. Treatment decision-making is challenging in such patient with indefinite fetal heart rate pattern because limited data exist to guide management. Well-designed studies are needed to clarify the uncertainty about the effect of indefinite fetal heart rate pattern on clinical outcomes.

**Keywords:** Cardiotocography, Cesarean section, Fetal heart rate, Pregnancy, Vasa previa

### **Introduction**

Most fetal heart rate patterns can be interpreted accurately, which facilitates appropriate access to clinical management of labor. Fetal heart rate patterns are defined according to four characteristics of baseline, variability, accelerations, and decelerations as described in the National Institute of Child Health and Human Development guidelines (1). Based on these characteristics, a three-tier system for the classification of fetal heart rate patterns is recommended. It is expected that after designation into one of the three categories as normal, indeterminate, or abnormal, management decisions could be made accurately (2).

However, a few fetal heart rate patterns are too ambiguous for the obstetricians to interpret them precisely. Treatments are challenging in such cases because limited data exist to guide management. We describe herein a fetal heart rate pattern of

regular decelerations in a patient with vasa previa, where recommendations based on the guideline are unavailable.

### **Case Report**

A 27-year-old woman at 38 weeks' gestation in her first pregnancy presented with a report of heavy vaginal bleeding and decrease in fetal movements for the past hour. She did not complain of abdominal pain and no uterine contractions were noted. Abdominal ultrasonography did not show any evidence of placenta previa, or inappropriate fetal measurements for the gestational age. Fetal status was indeterminate, according to an indefinite fetal heart rate tracing with regular decelerations (Fig. 1). An emergent cesarean delivery was performed, for acute fetal distress was suspected.

A male infant was delivered, with Apgar scores of 9 and 10 at 1 and 5 minutes, respectively. After delivery, examination of the placenta did not reveal placental abruption or placenta previa, but a velamentous cord insertion is discovered. Ruptured vasa previa traversing over the cervix was identified (Fig. 2). Laboratory tests revealed a fetal

hemoglobin value of 85 gr per liter. The infant was transferred to the neonatal intensive care unit for neonatal anemia, and received a transfusion of 65-mL packed red blood cell. The mother's postpartum recovery was uneventful, and she was discharged home on postoperative day 4. The baby was discharged in good condition on day 8 of life.

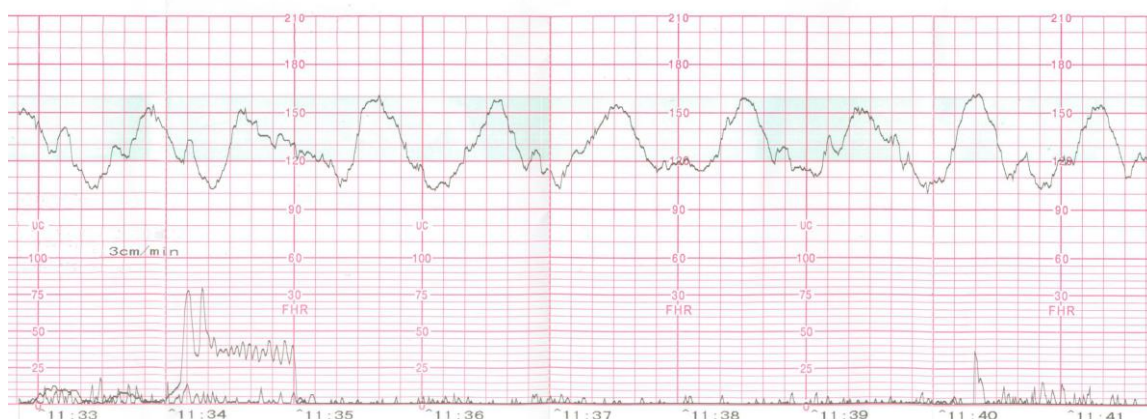


Fig. 1: Fetal heart rate tracing with regular decelerations of 50-60 beats per minute



Fig. 2: A ruptured vasa previa, traversing the fetal membrane of the lower segment over the cervix, unsupported by either the umbilical cord or placental tissue, was identified after delivery

## Discussion

The fetal heart rate pattern presented herein is an indefinite one, because the baseline rate is hard to identify. Recommendations for indefinite fetal heart rate pattern are unavailable due to the im-

possibility of categorization of a fetal heart rate pattern when its baseline rate is unrecognizable. But what if the fetal heart rate pattern had to be categorized? It should not be categorized as Category I (normal tracing), because there was deceleration in the pattern. It also should not be categorized as Category III (abnormal tracing), because recurrent late or variable decelerations defined in this category should be associated with uterine contractions, which is inconsistent with the presented pattern. Category II (indeterminate tracing) is the most likely option as it includes all fetal heart rate tracings not categorized as Category I or III (1). Category II tracings require reevaluation rather than an emergent cesarean delivery.

In this case, the decision to perform an emergent cesarean delivery was based on personal experience of the obstetrician and not entirely on guideline recommendations. Reevaluation of the patient, which is in keeping with the guideline but needs extra time, would be dangerous because the patient had later confirmed ruptured vasa previa, an obstetrical catastrophe with reported fetal mortality between 33 and 100 percent (3,4). Good fetal

outcome after active management in this case encourages us to prudentially recommend that regular decelerations be added as a criterion of Category III. So that patients with this kind of fetal heart rate pattern (presence of regular decelerations and absence of baseline rate) could be categorized correctly, hence receive expeditiously treatment. A single case is not sufficient evidence to address this issue. Well-designed studies are highly needed to clarify the uncertainty about the effect of indefinite fetal heart rate pattern on clinical outcomes.

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