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CASE REPORT

WILEY

Case report of paroxysmal atrioventricular block and ventricular arrest in a young pregnant woman: What is the mechanism?

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Abstract

A 30-year-old female patient with 12 weeks of gestation was admitted to our hospital due to dizziness and amaurosis fugax. Moreover, 24 h Holter monitoring showed paroxysmal atrioventricular block (P-AVB) and ventricular arrest. The heart block in the patient was likely a vagally mediated heart block based on the "vagal score." She was not given a pacemaker, and the symptoms and AV nodal conduction were improved following the delivery.

KEYWORDS
atrioventricular block, cardiovascular diseases, pregnant, ventricular arrest

1 | CASE REPORT

A 30-year-old female patient with 12 weeks of gestation was admitted to the Department of Cardiovascular Medicine with the complaint of dizziness and amaurosis fugax for 1 day. It happened every 2 ~ 3 min during the day, and each attack lasted about 20 ~ 30 s. She had no history of myocarditis or other heart disease and denied a family history of coronary heart disease or sudden cardiac death. The 12-lead electrocardiogram (ECG) was normal at a heart rate of 83 beats/min. Myocardial enzymology was negative. Echocardiography showed no abnormality.

Holter monitoring showed paroxysmal atrioventricular block (P-AVB) and 12 episodes of ventricular arrest with a duration of 3 ~ 7 s, occurring during 10 am at 9 pm, and the maximum ventricular arrest was 6.8 s (Figures 1 and 2). There were occasional atrial premature beats and ventricular premature beats during Holter monitoring. The symptoms of dizziness and amaurosis fugax only lasted for 4 days. The patient was not given a pacemaker. Shortly thereafter, the patient underwent two cycles of 24 h Holter monitoring, and no P-AVB was found. The pregnant woman delivered naturally at full term during our follow-up. The symptoms resolved after delivery. The patient did not undergo additional monitoring.

2 | DISCUSSION

P-AVB is an abrupt block of atrial impulses as they propagate to the ventricles, leading to ventricular asystole. Based on the history and the Holter monitoring, the patient was diagnosed with P-AVB. The patient was a young pregnant woman without structural heart disease. It was considered that straining and anxiety in early pregnancy might cause autonomic nerve dysfunction and lead to increase the excitability of the vagus nerve. Usually, the site of the block is above the His bundle, which is considered relatively safe. As the pregnancy progresses, the enlarged uterus may also compress the diaphragm, which can also cause vagus nerve excitement. Overexcitation of the vagus nerve inhibits the function of the atrioventricular node, leading to the occurrence of P-AVB. During the period of observation

FIGURE 1 A 24 h Holter monitoring showing P-AVB. The PR interval was gradually prolonged and the PP interval became longer before the onset of P-AVB. The PP interval became shorter before the termination of P-AVB

and repeat 24 h Holter monitoring, the decision was made to not implant a permanent pacemaker given the resolution of symptoms and heart block.

Two common mechanisms of P-AVB include vagally mediated mechanism and intrinsic conduction disease. The pathogenesis and treatment of P-AVB are different. Therefore, it is very important to determine the mechanisms of the two subtypes. Cardiac pacing should be avoided using for the management of a vagal P-AVB. P-AVB due to intrinsic conduction disease, especially from the His–Purkinje system block, should be treated with pacemaker implantation in time to effectively prevent the occurrence of cardiac events. The "vagal score" is a new ECG index to determine the mechanism of P-AVB (Komatsu et al., 2017). The vagal score is developed by assigning 1 point each for the following items: (1) normal ECG without conduction abnormality, (2) prolongation of PR interval just before P-AVB, (3) PP prolongation just before P-AVB, (4) initiation of P-AVB by PP prolongation, (5) PP prolongation during ventricular asystole, (6) resumping of AV conduction with shortening PP interval, and by assigning -1 point each for (7) initiation of P-AVB by a premature beat, and (8) resumping of AV conduction by an escape beat. P-AVB with a vagal score ≥3 points strongly suggests a vagally mediated mechanism. When the total score is less than 1 point or negative, the P-AVB due to intrinsic conduction disease can be identified. We analyzed Figure 1, and the results showed that the total vagal score was 5 points (see Table 1), indicating that the pregnant woman had a vagal P-AVB.

3 | CONCLUSION

P-AVB is accompanied by an abrupt block of ventricular arrest and intermittent attacks. Therefore, it may lead to a high risk of sudden cardiac death. The resting ECG is difficult to record P-AVB, and its definite diagnosis usually relies on long-term Holter monitoring. Pregnancy with P-AVB is uncommon and difficult to be detected. Therefore, for pregnant women with symptoms of dizziness, 24 h Holter monitoring can be conducted to help detect P-AVB. We should pay more attention to this aspect of pregnant women in future clinical practice. The ECG index "vagal score" is very important for the determination of the mechanism of P-AVB and the choice of treatment. This method can be used in clinical diagnosis and guide clinical treatment.

Last, to the best of our knowledge, this is the first case of P-AVB in a young pregnant woman. We used the ECG index "vagal score" to determine the mechanism of P-AVB and gave the correct management.

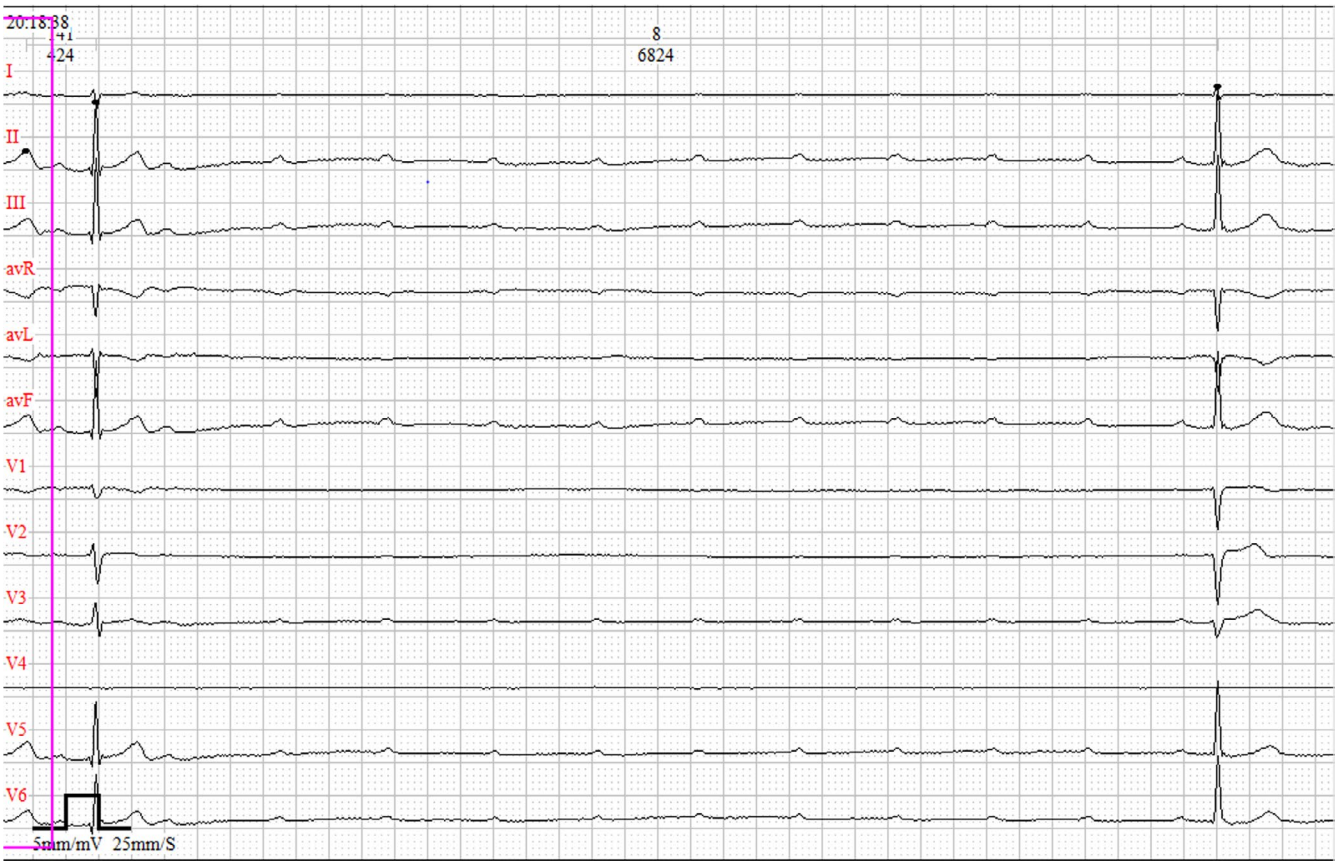

FIGURE 2 A 24 h Holter monitoring showing P-AVB, Ventricular arrest lasted for 6824 ms

TABLE 1 The vagal score of the patient

ECG index	score	patient
①Normal ECG without conduction abnormality	1	1
②Prolongation of PR interval just before P-AVB	1	1
③Sinus slowing just before P-AVB	1	1
④Initiation of P-AVB by PP prolongation	1	1
⑤Sinus slowing during ventricular asystole	1	–
⑥Resumption of AV conduction with PP shortening	1	1
⑦Initiation of P-AVB by a premature beat	−1	–
⑧Resumption of AV conduction by an escape beat	−1	–
Total points		5

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CONFLICT OF INTEREST

All authors declare that they have no conflict of interest.

AUTHOR CONTRIBUTION

All authors have made substantial contributions to the study. All authors endorse the data and conclusions.

ETHICAL APPROVAL

This case report was approved by *the First Hospital of Changsha, Hunan, China*. The patient had the opportunity to read the present case report and had no objections to the case report.

DATA AVAILABILITY STATEMENT

Data sharing not applicable to this article as no datasets were generated or analysed during the current study

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