



Bradyarrhythmia during pregnancy: A Tale of two cases of Atrioventricular block during first trimester



Joseph Mancuso, Senan J Yasar MD, Tushar Tarun MD, Richard Weachter MD
Division of Cardiovascular Medicine, University of Missouri-Columbia

Learning Objective

The purpose of these cases is to illustrate the management dilemma presented when pregnant subjects present with significant bradyarrhythmias.

Background

Heart block during pregnancy is rare, but when present has its challenges to management. Complete heart block may be congenital or acquired, which can be associated with infection, prior cardiac surgery, acute myocardial infarction, and more. Women may present with syncope, presyncope, or it may be an incidental finding on ECG. There are no guidelines that address the monitoring of conduction disorders in women during pregnancy. For patients with complete heart block, pacemaker implantation is typically recommended for those who are either symptomatic or asymptomatic with heart block below the bundle of His. The most common concern with managing heart block during pregnancy is radiation exposure using fluoroscopy during pacemaker implantation. Fetal risks of anomalies, growth restriction, or abortions are not increased with radiation exposure of less than 50 mGy (5 rads).

Case Presentations

Case 1

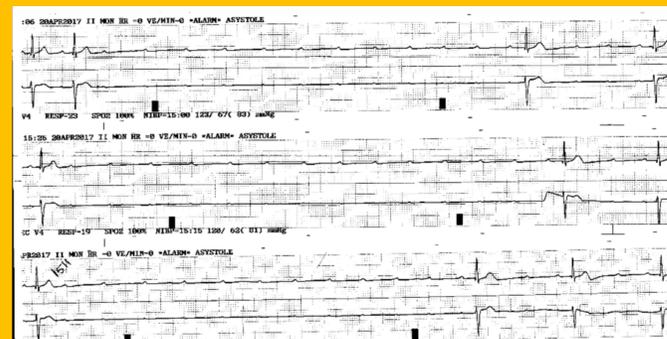
Case Presentation

A seven-week pregnant, 25-year-old G1P0 female with history of a seizure disorder presented to the hospital with recurrent loss of consciousness without prodromal symptoms. Telemetry showed intermittent complete heart block with ventricular asystole and resultant pauses up to 9.2 seconds that alternated with Mobitz II AV block with an effective heart rate of 36 beats per minute. Episodes were associated with dizziness. Baseline electrocardiogram revealed a PR interval of 191 ms and QRS duration of 73 ms. Echocardiogram showed a normal ejection fraction and no significant valvular defects

Decision Making

A temporary transvenous pacemaker was placed followed by a Biotronic dual-chamber pacing system with closed loop stimulation (CLS). A lead apron over the mother's abdomen was used during pacemaker placement to reduce radiation to the fetus. The patient received a total exposure of 11 mGy. Of note, incremental atrial pacing during the procedure resulted in Wenckebach conduction, which occurred at a rate of 105 beats per minute and suggested intrinsic conduction system disease. She was discharged home without complication. Upon one-year follow-up, the patient was asymptomatic without any further episodes of syncope or seizure. Her device was properly functioning with 50% atrial and 8% ventricular pacing noted.

Figure 1. Telemetry showing complete heart block with ventricular asystole.



Case 2

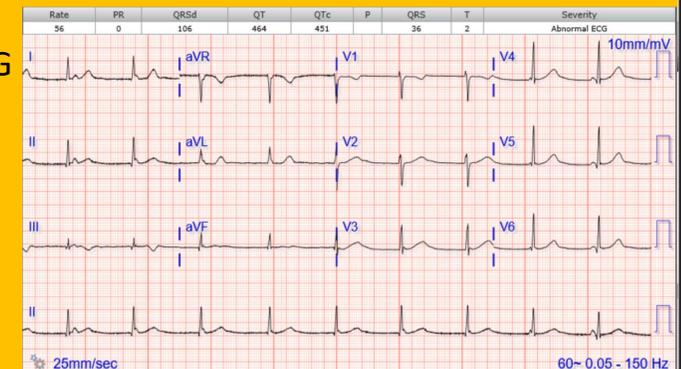
Case Presentation

A thirteen-week pregnant, 22-year-old white G1P0 female presented to the hospital following a syncopal episode with prodromal symptoms. She had no notable past medical history. The initial electrocardiogram showed junctional rhythm, rate 54 beats per minute, with AV dissociation. Lab assessment demonstrated a potassium level of 2.7 mmol/L. Echocardiogram showed a normal ejection fraction with no abnormalities.

Decision Making

The patient's hypokalemia was corrected and a Medtronic MRI compatible dual-chamber pacing system was implanted. A lead apron was used to shield the fetus from radiation exposure. The patient received a total dose of 256 mGy during implantation due to difficulties in lead placement. At 12-month follow-up, the patient was doing well with a normal functioning device. Interrogation revealed 25% atrial and 0.7% ventricular pacing

Figure 2. ECG showing AV dissociation with junctional rhythm.



Conclusion

Managing AV block during pregnancy requires balancing the immediate safety of the mother and fetus with the potential for long-term effects of radiation exposure during device implantation. Nevertheless, numerous measures can be taken to minimize the total dose of radiation, including strategic use of lead barriers, minimizing fluoroscopy time, and reducing the frame rate.