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# The Fitbit: A novel tool for predicting complete heart block

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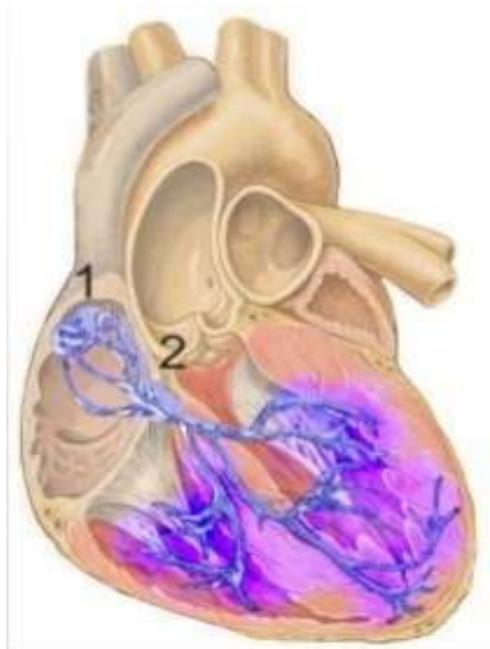


## Abstract

Bifascicular block has the potential risk of progression to complete heart block. Typically, monitoring for symptoms and heart rate guides timing for definitive pacemaker therapy. Current monitoring devices being used include Holter, event recorder, and implantable loop recorder. We present a case of a 72-year-old male with a history of coronary artery disease coronary artery bypass graft surgery and bifascicular block who presented to the hospital with syncope which required emergent transvenous pacemaker prior to permanent pacemaker placement. About 2 weeks prior to presentation, he had a syncopal spell while he was wearing his ambulatory wrist heart monitor “a Fitbit”. Upon review of the Fitbit heart rate monitor, the Fitbit had correctly recognized bradycardia during his syncopal spell. We report a case of a Fitbit correctly identifying advancing paroxysmal complete heart block. The Fitbit and other wearable wrist monitors maybe an alternative way to monitor patients long-term at increased risk for progression to complete heart block.

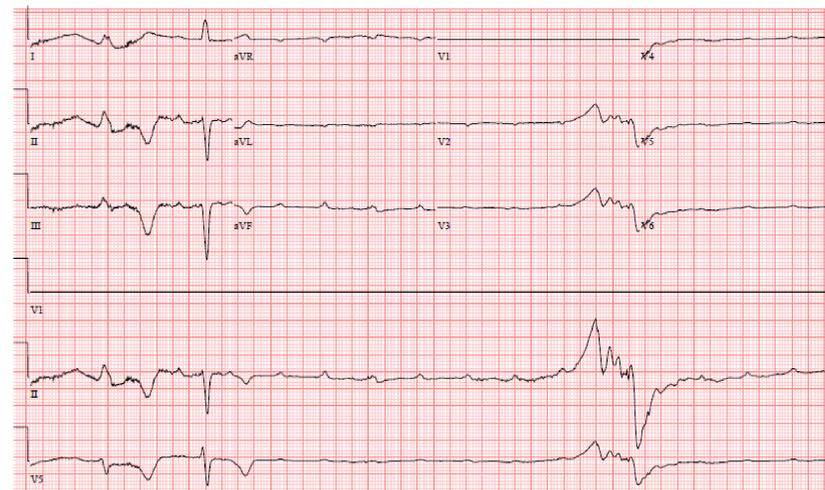
## Introduction

- Normal conduction system has three fascicles supplying electrical activity to the ventricular myocardium
- Bifascicular block results when two of the three fascicles have been interrupted
- Around 10% of the patients with bifascicular block will progress to complete atrioventricular block
- Prediction of progression does not exist currently and definitive pacemaker treatment is based on symptoms

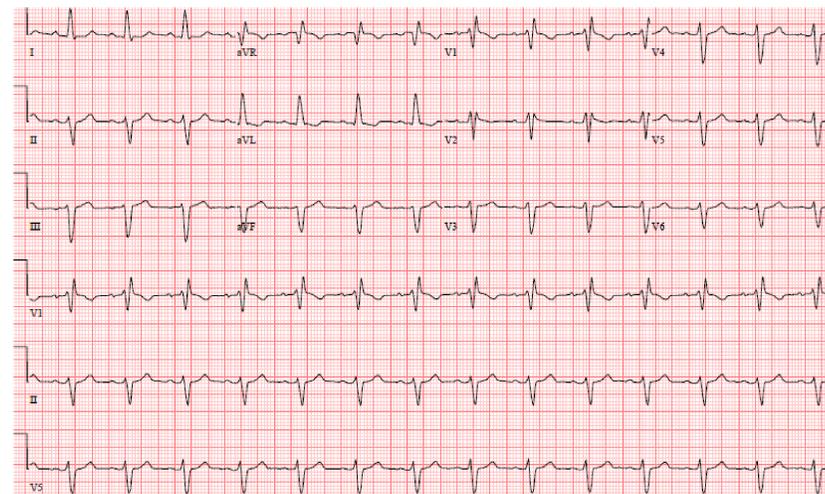


## Case Presentation

We present a case of a 72-year-old male with past medical history of coronary artery disease, status post cardiac bypass surgery, hypertension, hyperlipidemia and bifascicular block who initially presented after syncopal episode when he was exercising on treadmill. The patient was found to be in complete heart block when Emergency Medical Services arrived. The patient went into Pulseless Electrical Activity in the emergency department and underwent Cardiopulmonary Resuscitation with return of spontaneous circulation. A temporary transvenous pacemaker was inserted and the patient underwent urgent cardiac catheterization which showed no significant worsening artery disease. The patient did not have any reversible etiology for the complete heart block. The patient underwent successful single-chamber permanent pacemaker implantation on day 6 of hospitalization. About 2 weeks prior to the presentation, he had another syncopal episode while he was wearing his wrist heart monitor “a Fitbit”. Upon review of his Fitbit heart monitor, it had currently recognized bradycardia during episode. The episode of bradycardia was likely advancing paroxysmal complete heart block causing the syncopal episode.



EKG of the patient on initial presentation showing complete heart block



Previous EKG of the patient showing bifascicular block

## Discussion

- Progression of bifascicular block is unpredictable
- Monitoring techniques in addition to symptoms (syncope, presyncope) include Holter monitor, event monitor or implantable loop recorder
- Wearable heart monitors are being commonly used for detection of Atrial fibrillation such as the Apple watch study
- We report a case of Fitbit accurately detecting progression of AV block in patient with bifascicular block

## Conclusion

Wearable wrist heart monitors such as Fitbit may be an alternative way to monitor patients with increased risk of progression to complete heart block. It might be an alternative way compared to the conventional methods like Holter monitor, event recorder or implantable loop recorder. It also helps monitor the patient closely thereby preventing morbidity and mortality due to progression to complete heart block.



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