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Wearing an Applea Day Won't Keep the Doctor Away: Diagnosing Wolff-Parkinson-White Syndrome With an Apple Watch

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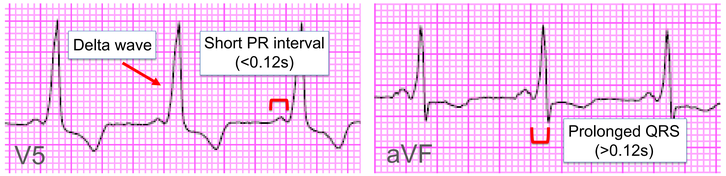
Case Presentation

History

- 35-year-old previously healthy male
- Presented to clinic concerned that Apple Watch was episodically reporting heart rate 220 bpm at rest
- Episodes lasted 1-6 minutes before spontaneously resolving
- Further interviewing revealed episodes associated with "feeling uncomfortable" and near-syncope

Clinical Course

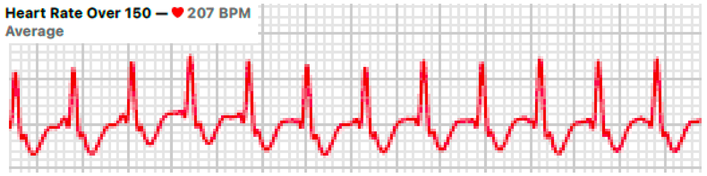
- EKG showed normal sinus rhythm with ventricular pre-excitation also known as Wolff-Parkinson-White (WPW) pattern
- This pattern coupled with symptomatic arrythmias is diagnostic of WPW syndrome



- Urgently referred to electrophysiology (EP)
- Prior to appointment went to emergency department for sustained supraventricular tachycardia (SVT), required diltiazem to convert to normal sinus rhythm, discharged on flecainide
- EP mapping revealed atrioventricular reentry tachycardia via anteroseptal bypass tract
- Elected to treat with ablation given symptomatic tachyarrhythmia

Outcome

- Continues to have SVT as documented on watch (below)
- Confirmed residual bypass tract present, now awaiting repeat ablation



Wolff-Parkinson-White Syndrome

A rare congenital condition with an accessory atrioventricular (AV) pathway which leads to ventricular preexcitation and can cause a supraventricular tachycardia

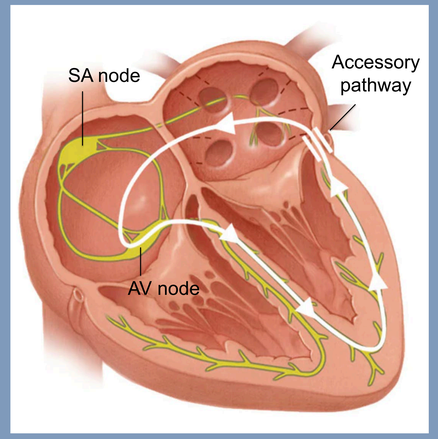
Prevalence in General Population

- WPW syndrome: 0.01-0.03%[1]

Clinical manifestations

- Palpitations
- Syncope or presyncope
- Chest pain

Management[2]	
Acute termination - Unstable	• Synchronized cardioversion
Acute termination - Stable	• Vagal maneuver • Antiarrhythmic
Chronic prevention	• Catheter ablation (first-line) • Antiarrhythmic



Using a Smartwatch

- User holds a finger from the opposite hand of the watch on the watch's edge
- Timer counts down 30 seconds
- EKG results on screen
- Data syncs with iPhone which can be exported as PDF and shared with physician

Smartwatches with FDA-Approved EKG

Fitbit Sense
Fitbit Charge 5

Apple Series 4-7

Samsung Galaxy Watch 2-4

Discussion

- This case is novel in that it demonstrates how patients can be directed by their smartwatch to be diagnosed with and manage WPW syndrome
- Patient much more alarmed by smartwatch-reported tachycardia than symptoms indicating he likely would have delayed or not sought care for symptoms alone
- Observing this suggests having a smartwatch may allow patients to overcome barriers to seek care which expedites treatment
- Barriers include hesitancy to visit a clinic in setting of COVID-19, limited access to health care, and lacking establishment with a primary care provider, particularly as a young and otherwise healthy adult

- Apple Watch EKG app classification algorithm (normal sinus rhythm vs. atrial fibrillation) showed sensitivity 93% and specificity of 84% under ideal watch placement and arm positioning[3]
- Limitations of smartwatch use include patient anxiety and unnecessary testing if device produces false positive or reads rhythm as "unclassifiable"

Takeaway Points

- Smartwatches are increasing in popularity[4] with some now including FDA-approved EKG
- Smartwatches may make patients more apt to take initial action and engage with the health care system, ultimately expediting treatment
- Validity of smartwatches for detecting dysrhythmias is proven to be a good alternative to EKG for ambulatory real-time monitoring[5]

References

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