EM CASE OF THE WEEK.
BROWARD HEALTH MEDICAL CENTER
DEPARTMENT OF EMERGENCY MEDICINE

BROWARD HEALTH
Care Warriors

Wah Wong, NSU OMS-IV

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Wolff-Parkinson White Syndrome

A 33-year-old male with no significant past medical history ambulates to the ED with two prior syncopal episodes within the last 3 hours. Patient reports that earlier in the day after urinating he experienced a syncopal episode while walking back the bathroom. He states he lost consciousness for approximately 30 seconds. After recovering, as the patient was cooking an hour later, he experienced his second syncopal episode but was able to brace himself. He reports that he has had a history of syncope in the past, but attributes this to vasovagal causes. During this current syncopal episode, he denied any chest pain, SOB, feeling flush or warm prior to LOC. Patient currently reports a minor bump localized to the posterior skull base due to the fall, but otherwise feels well. He denies any headache or vision changes.

Upon evaluation, patient appears to be a well-groomer, fit Caucasian male. He is conversive and alert. Cardiac exam reveals sinus bradycardia, with no murmurs, heaves, lifts or thrills. Lungs are CTA bilaterally without any increased work of breathing or noticeable stridor or wheezes. CN2-12 grossly intact. The remainder of the physical exam is within normal limits.

EKG is done and shown on the following page.

Based on the H&P and EKG findings (on the following page), what would be the next step in management?

A. Direct Cardioversion
B. Morphine + O2 + Nitroglycerin + Aspirin (MONA) and Discharge
C. Discharge + Follow-up Outpatient Cardiology
D. Admission + Consult Cardiology
E. Emergent Open-Heart Surgery

Vitals:
Temp: 97.8F
HR: 50 beats/min, regular
RR: 16 breaths/min
BP: 100/60 mm Hg
O2: 97% Sat on RA

Height: 5'11
Weight: 180 lb

Labs:
Troponin: Pending
BMP: Pending
CMP: WNL

EM Case of the Week is a weekly "pop quiz" for ED staff.

The goal is to educate all ED personnel by sharing common pearls and pitfalls involving the care of ED patients. We intend on providing better patient care through better education for our nurses and staff.

BROWARD HEALTH MEDICAL CENTER

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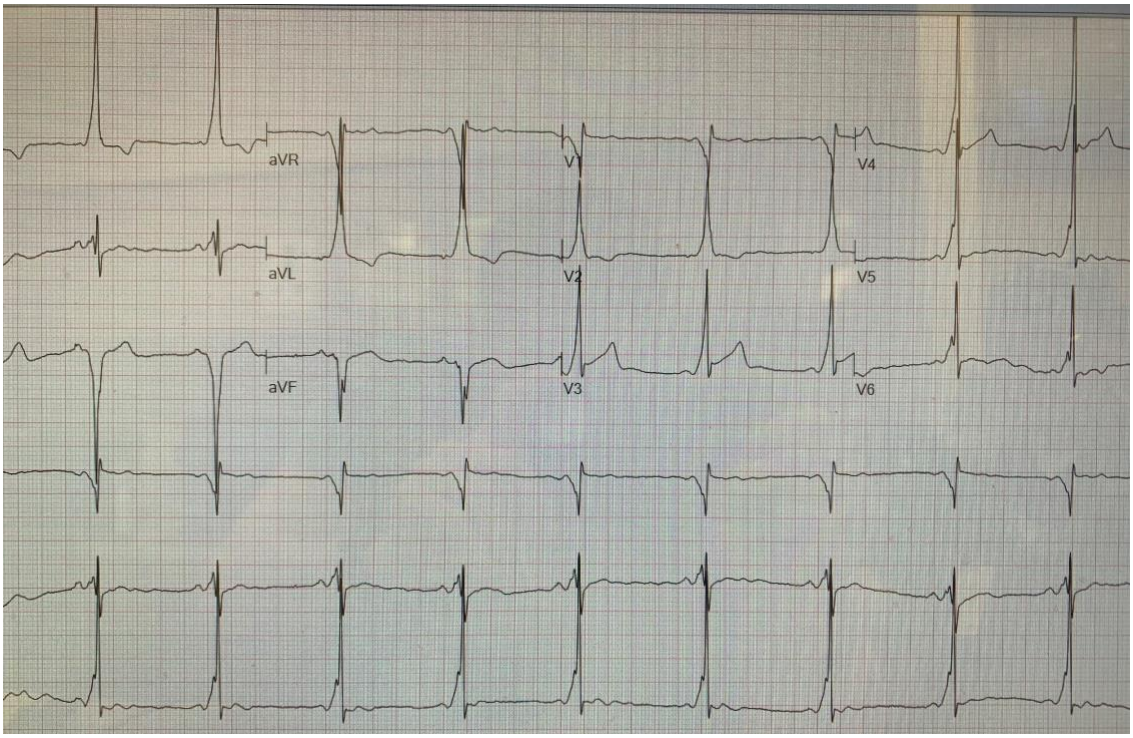

Differential Diagnosis:
Myocardial Infarction
Wolff-Parkinson-White Syndrome
Pericarditis
AV Block (1*/2*)

The correct answer is D. This is an EKG consistent with Wolff-Parkinson-White Syndrome. In WPW cases, it is important to admit the patient and consider radiofrequency ablation as part of long-term therapy. If they are unstable secondary to the arrythmia, direct cardioversion would be necessary. MONA would be used for acute STEMI, which is not likely due to the absence of ST elevations. Pericarditis commonly presents with diffuse ST elevations, as well as an absence of pleuritic chest pain and friction rub rules out this differential diagnosis. While AV blocks can present with bradycardia, the common theme of primary and secondary AV blocks is PR prolongation, which is the opposite to the shortened PR interval seen above.

Discussion:
Wolff-Parkinson-White is a form of arrythmia due to an accessory pathway between the upper and lower chamber of the heart. This accessory pathway via the Bundle of Kent allows for SA node automaticity to bypass the AV node in the conduction pathway.[1] Therefore, this leads to pre-mature excitation, increased ventricular beats and decreased ventricular filling. This decreased filling can lead to bradycardia, and syncope as seen in this patient.

Treatment:
Long-term definitive treatment is radiofrequency ablation if the patient is stable. If the patient is unstable, direct cardioversion must be attempted to restore temporary functional conduction pathway.[2][3] Pharmaceutical treatment may be used as well, such as procainamide, which is a class 1a sodium channel blocker. In this particular case, the patient is stable, and thus the next step would include a Cardiology consult for ablation.

For a list of educational lectures, grand rounds, workshops, and didactics please visit ***BrowardER.com*** and **click** on the ***"Conference"*** **link**.

All are welcome to attend!

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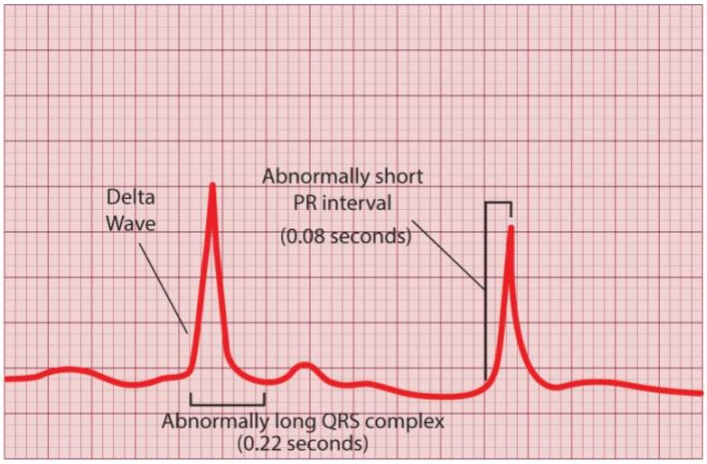

Key EKG Points:

Due to the accessory pathway via the Bundle of Kent, which bypassed the AV node, there is pre-excitation of ventricular function, which results in the classic hallmarks of WPW on an ECG:

1) Shorted PR interval
2) Slurred "Delta" Wave
3) Prolonged QRS

References:

1. Biase, Luigi Di, and Edward P Walsh. "Wolff-Parkinson-White Syndrome: Anatomy, Epidemiology, Clinical Manifestations, and Diagnosis." *UpToDate*, UpToDate, 4 Oct. 2019, www.uptodate.com/contents/wolff-parkinson-white-syndrome-anatomy-epidemiology-clinical-manifestations-and-diagnosis?search=wolff+parkinson+white.

2. Chhabra L, Goyal A, Benham MD. Wolff Parkinson White Syndrome. [Updated 2020 Aug 10]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan-. [Figure, Wolff-Parkinson-White-Syndrome, Delta Wave, Abnormally short...] Available from: https://www.ncbi.nlm.nih.gov/books/NBK554437/figure/article-31383.image.f1/

3. Liu, Lucy. "Wolff-Parkinson-White (WPW) Syndrome." *Wolff-Parkinson-White (WPW) Syndrome - Cardiovascular - Medbullets Step 2/3*, MedBullets, 10 Oct. 2021, step2.medbullets.com/cardiovascular/121718/wolff-parkinson-white-wpw-syndrome.

4. Newhouser, Karen. "Syncope." *Back-2-Basics-Series-Syncope*, Medpartners, 19 Apr. 2017, www.medpartners.com/back-2-basics-series-syncope/.

5. *Wolff Parkinson White Syndrome*, Pediatric Heart Specialists, 2021, pediatricheartspecialists.com/heart-education/18-arrhythmia/192-wolff-parkinson-white-syndrome.

Management:

Because there is a risk for sudden cardiac death due to improper filling of the ventricles, it is important to work these patients up with an ECG, Echocardiogram, exercise stress-test and maintain appropriate cardiac follow-up.[1][2] Pharmaceutical management may be pursued via procainamide, but definitive treatment would include radiofrequency ablation via catherization. It is also important to avoid pharmaceutical treatment which may prolong the AV node conduction, such as digoxin, calcium channel blockers, amiodarone, and beta-blockers.[3]

This month's case was written by Wah Wong. Wah is a 4th year medical student from NSU-COM. He did his emergency medicine rotation at BHMC in January of 2021. Student Doctor Wong plans on pursuing a career in Internal Medicine after graduation.