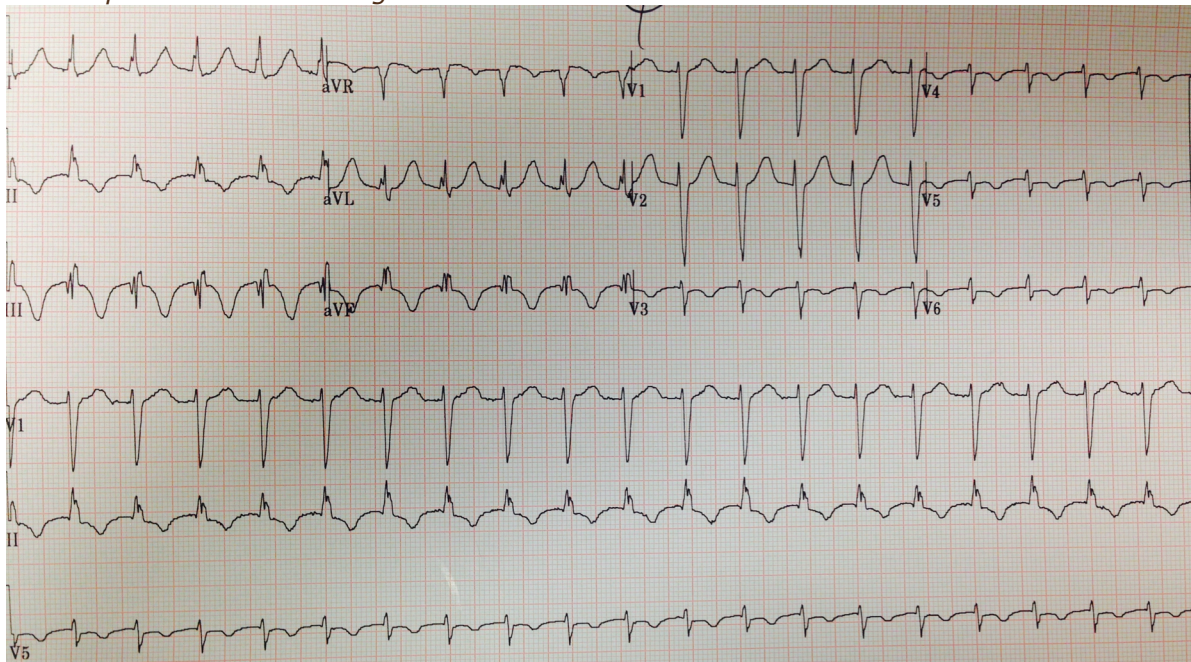


EM CASE OF THE MONTH

BROWARD HEALTH MEDICAL CENTER DEPARTMENT OF EMERGENCY MEDICINE

Wolff-Parkinson-White Syndrome

A 36 year old female with history of hypertension presents with persistent palpitations and "racing heart" after yelling at her son. States she has had these palpitations in the past. She denies chest pain or discomfort, dizziness, or syncope, headache, visual changes, dyspnea, fever, weakness or numbness. Vital signs revealed a heart rate of 121 bpm, systolic blood pressure of 128mmHg and diastolic blood pressure of 87mmHg. EKG is shown below.



What is the treatment?

- A. Cardioversion-defibrillation
- B. Cardioversion; IV procainamide, sotalol, lidocaine, or amiodarone.
- C. Adenosine



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The correct answer is C. This patient is presenting with supraventricular tachycardia (SVT) and Wolf-Parkinson-White Syndrome (WPW).

Clinical Pearls:

- **What are supraventricular tachycardias?**

SVT is improper electrical activity of the heart originating at or above the atrioventricular node. It can be broken down into two different mechanisms: re-entrant and automaticity. As well as irregular and regular. Irregular SVT includes: atrial fibrillation, and multifocal atrial tachycardia. While regular includes sinus tachycardia, atrial flutter, atrial tachycardia, atrioventricular tachycardia, atrioventricular nodal reentrant tachycardia, and junctional tachycardias.

- **What is Wolf-Parkinson-White Syndrome?**

WPW arises when a patient has an accessory pathway of myocardial fiber connecting the atria and ventricles with evidence of antegrade conduction. Patients may be in normal sinus rhythm or have a variety of supraventricular tachydyrhythmias, including AVRT in 80% of cases, AF in 15%-30%, and atrial flutter in 5%.

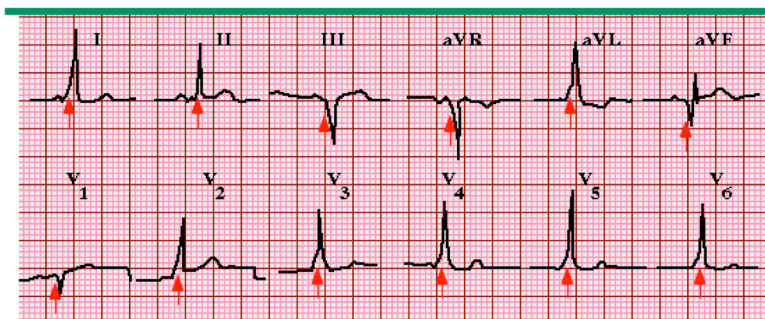
Morning Report Questions:

- **How does Wolff-Parkinson-White Syndrome present?**

Presents as SVT that can alternate with ventricular tachycardia. SVT presents with palpitations and tachycardia and occasionally syncope. SVT is not associated with ischemic heart disease. SVT has a regular rhythm with a ventricular rate of 160-180 bpm.

- **How is WPW diagnosed?**

12-lead electrocardiogram (ECG) showing the Wolff-Parkinson-White pattern



The two main electrocardiographic features of Wolff-Parkinson-White (WPW) pattern include a short PR interval (<0.12 seconds) and a delta wave (red arrows). The QRS complex is wide (>0.12 seconds) and represents a fusion beat; the initial portion (delta wave) results from rapid ventricular activation via the accessory pathway (pre-excitation), while the termination of ventricular activation is via the normal conduction system leading to a fairly normal terminal portion of the QRS.

Medical therapy of arrhythmias associated with Wolff-Parkinson-White syndrome

Arrhythmia	Preferred	Contraindicated
Orthodromic AV reentrant tachycardia		
Acute termination*	Vagal maneuvers IV verapamil IV adenosine Second-line: IV beta blocker IV digoxin IV amiodarone	
Chronic prevention*	Class IC Second-line: Beta blocker Calcium channel blocker Digoxin Class IA Amiodarone Sotalol	
Antidromic AV reentrant tachycardia		
Acute termination*	IV procainamide	Consider only if diagnosis secure: IV beta blocker IV calcium channel blocker IV digoxin IV adenosine
Chronic prevention*	Class IC Second-line: Class IA Amiodarone	Beta blocker Calcium channel blocker Digoxin
Atrial fibrillation		
Acute termination*	IV procainamide IV class IC if available	
Chronic prevention*	Class IC Class IA Amiodarone	

Class IC: flecainide, propafenone; class IA: quinidine, procainamide, disopyramide.
* Cardioversion is indicated if hemodynamically unstable or drugs are ineffective.
• Ablation of the accessory pathway is generally preferred to cure the arrhythmia.



• **How is WPW treated?**

Hemodynamic status is what you are first looking at. Unstable hemodynamic status should undergo urgent electrical cardioversion.

Patients are generally treated because of symptomatic arrhythmia or the risk of a life-threatening arrhythmia, while asymptomatic patients with the WPW pattern are usually not treated.

Treatment options for persons with arrhythmias and the WPW syndrome include nonpharmacologic therapies such as catheter ablation of the accessory pathway as well as pharmacologic therapy to slow ventricular heart rates or to prevent arrhythmias.

Clinical Pearls:

Orthodromic SVT: results in regular and narrow complex rhythm.

Antidromic SVT: results in regular and wide complex rhythm.

SVT with WPW can be treated as per usual narrow and wide complex tachycardia algorithms.

Resources:

1. Mattu, Amal. *Emergency ECG Video of the Week: WPW: Orthodromic and Antidromic SVT*. University of Maryland Emergency Medicine. <http://ekgumem.tumblr.com/post/17949025577/wpw-orthodromic-and-antidromic-svt-episode>
2. Buise, Luigi. *Treatment of Symptomatic Arrhythmias Associated with the Wolff-Parkinson-White syndrome*. UpToDate. 2014.
3. Adams, James. *Emergency Medicine*. 2nd Edition. Elsevier. 2013.