

EM CASE OF THE WEEK.

BROWARD HEALTH MEDICAL CENTER
DEPARTMENT OF EMERGENCY MEDICINE



Care Warriors

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Wide Complex Tachycardia

A 62-year-old female with past medical history of HTN, HLD, CVA and seizures presents to the ED with primary occurrence of intermittent palpitations for 1 day. She admits to nausea, epigastric discomfort, 1 episode of vomiting and some dizziness while having the palpitations. She denies chest pain, shortness of breath, diaphoresis and syncope. Patient is afebrile and vitals are within normal limits with the exception of her HR (170 bpm). Physical exam was unremarkable. Initial EKG results is as shown below. Which of the following is the most appropriate management of this patient's condition after ABC's have been addressed?

- A. Amiodarone 150 mg over 10 minutes
- B. Synchronized Cardioversion
- C. Vagal Manuever
- D. Adenosine 6 mg rapid IV push
- E. Stat consult for an Electrophysiologist

VR: 170bpm, QRS: 124 ms, QT/QTc: 298/501 ms



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.

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Warriors

The correct answer is: E. Stat consult for an Electrophysiologist

Wide complex tachycardia (WCT) is defined as a cardiac rhythm with a heart rate greater than 100 bpm and a QRS longer than 120 ms. Differential diagnosis range from benign to life threatening but mainly revolves around distinguishing ventricular tachycardia (VT) from supraventricular tachycardia (SVT) with aberration. Treating WCT have been challenging for ER physicians due to the absence of a definitive algorithm for proper diagnosis, differences in management and possible complications of incorrect treatment.

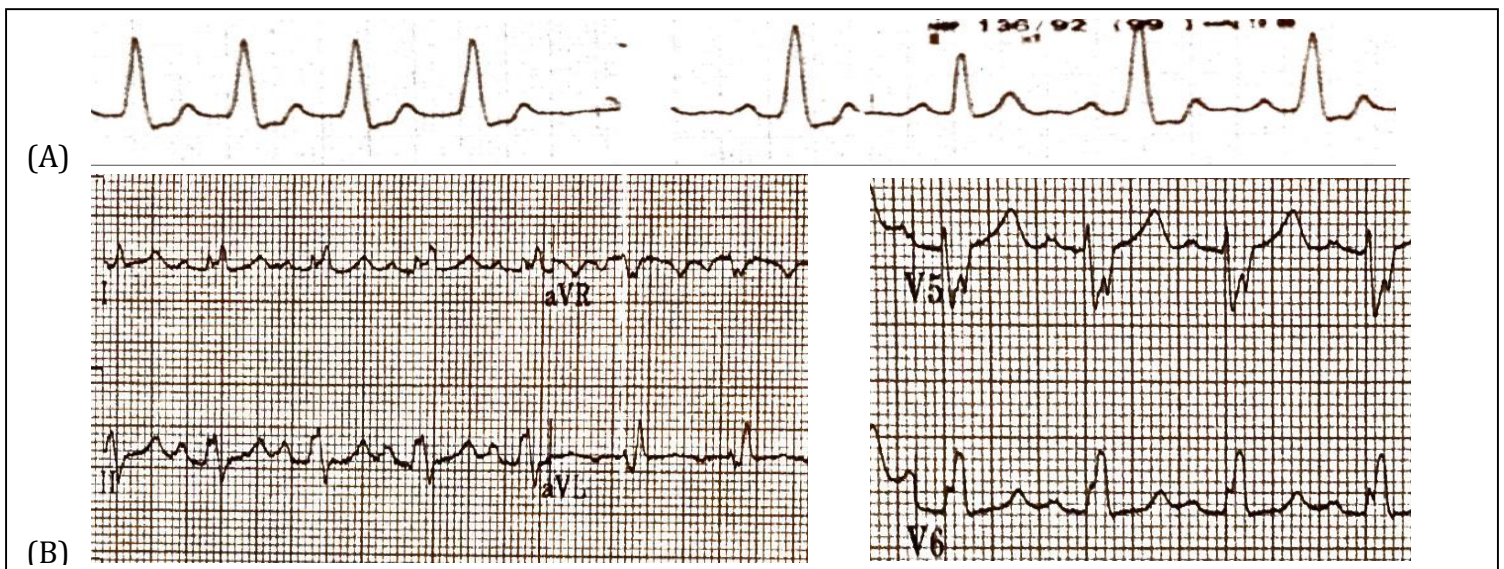
Discussion

The main diagnostic possibilities for WCT include VT and SVT with aberrant conduction secondary to a bundle branch block or Wolf-Parkinson-White Syndrome (WPW). The widened QRS in bundle branch blocks and WPW distorts the typical narrow (<120 ms) QRS characteristic of a pure SVT, calling into question the possibility of SVT with aberrance vs. VT. However, the increased rate in WCT often "hides" the delta wave or RR' (bunny ears)

associated with WPW and bundle branch blocks respectively, making the differentiation more complicated. Some features that are suggestive of VT include QRS complexes >160ms, AV dissociation, absence of bundle branch block morphology, or RR' complexes with a taller "left bunny ear" (most specific). VT is also more likely if the patient is >35 years old, has history of heart disease, MI, CHF, cardiomyopathy or family history of sudden cardiac death. The likelihood of SVT with aberrancy is increased if previous ECG show identical morphology, evidence of WPW or if the patient had previous episodes of palpitations amenable to vagal maneuvers or adenosine. Several algorithms exist to aid in diagnosis of WTC, one of which is the ACA/AHA Algorithm (*Figure 1*), however there is not one that is consistently reliable.

Management

According to ACLS, the treatment of VT in an unstable patient with a pulse is synchronized cardioversion. The treatment of VT in a stable patient with a pulse includes adenosine (if regular and monomorphic), an antiarrhythmic such as amiodarone or expert consultation. There is concern that adenosine may lead to atrial fibrillation

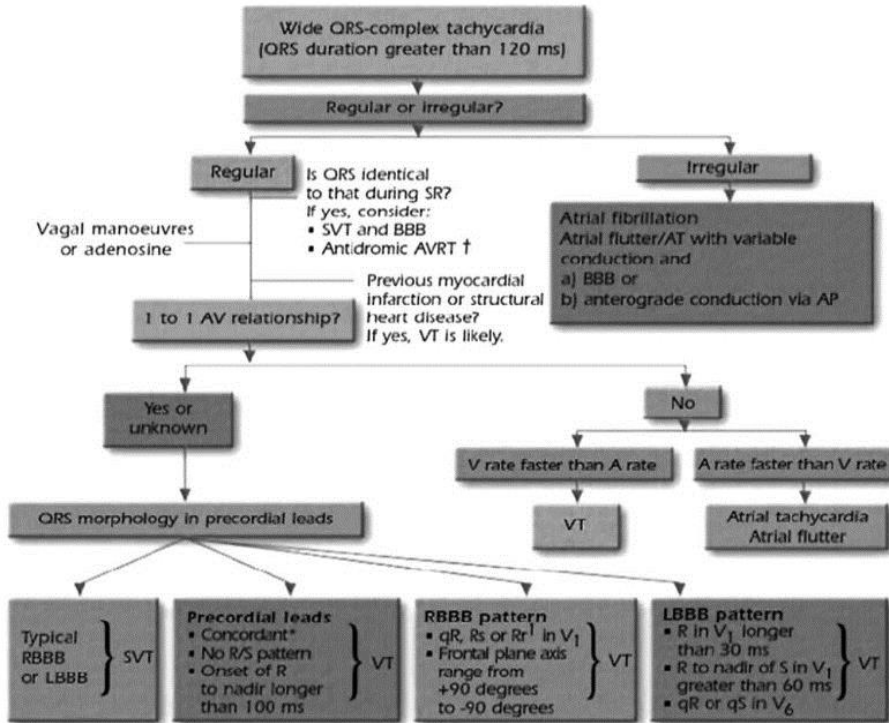


For a list of educational lectures, grand rounds, workshops, and didactics please visit BrowardER.com and click on the "Conference" link.

All are welcome to attend!

ACC/AHA Algorithm for Differential Diagnosis of WCT

Figure 1



or rapid ventricular rates in patients with pre-excitation syndromes such as WPW. However, the rise in ventricular rates has not consistently led to hemodynamic deterioration. Additionally, adenosine has been used to reveal primary etiologies for WCT by decreasing the heart rate and exposing accessory pathways (A), (B). AV-nodal blocking agents such as verapamil and diltiazem, should not be used in WCT due to tendency to cause hemodynamic instability in those with VT misdiagnosed as SVT.

WCT should be treated as VT if there is uncertainty and especially if the patient is unstable. Once stability has been attained, the ER physician may then research and apply algorithms and/or pursue expert consultation (i.e. Electrophysiologist) for further management.

Take Home Points

- It is not always possible to differentiate VT from SVT with aberrancy using ECG.
- Algorithms for differential diagnosis of WCT are not consistently reliable.
- Do not administer AV-nodal blocking agents in those with WCT.
- If the patient with WCT is unstable, treat as VT and perform synchronized cardioversion.



ABOUT THE AUTHOR

This month's case was written by Kaydian Hunter. Kaydian is a 4th year medical student from NSU-KPCOM. She did her emergency medicine rotation at BHMC in November 2017. Kaydian plans on pursuing a career in Family Medicine after graduation.

REFERENCES

1. Garmel, G. M. (2008). Wide Complex Tachycardias: Understanding this Complex Condition Part 2 - Management, Miscellaneous Causes, and Pitfalls. *Western Journal of Emergency Medicine*, 9(2), 97-103.
2. B Garner, J., & M Miller, J. (2013). Wide Complex Tachycardia - Ventricular Tachycardia or Not Ventricular Tachycardia, That Remains the Question. *Arrhythmia & Electrophysiology Review*, 2(1), 23-29. <http://doi.org/10.15420/aer.2013.2.1.23>
3. Burns, Ed. (2017). VT versus SVT with aberrancy. *Life in the Fastlane*. <https://lifeinthefastlane.com/ecg-library/basics/vt-vs-svt/>