ECG Of The Month

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Citation

Abstract
45 years old male, with h/o frequent episodes of palpitations and hypertension on amlodipine, no h/o of CAD or MI with family h/o HT got admitted with haemodynamic compromise. ECG at admission revealing Figure 1: wide QRS tachycardia.

D Dx.
- a) Ventricular tachycardia.
- b) SVT with Aberrancy.
- c) Pre-excitation with AF with F VR.
- d) Bundle Branch Re-Entry Tachycardia.

At first glance one thinks of VT in view of wide QRS complex. However if one looks at ECG carefully the absence AV Dissociation, Capture/Fusion beats, Lack of regularity makes VT unlikely. The presence of underlying CAD or Prior MI has an accuracy of >90% in predicting ventricular mechanism of wide QRS complex arrhythmia, both were absent in our patient. Second important is the differentiation between SVT with aberrancy and pre-excitation. Pre-excitation can be diagnosed by applying Burgadas Criteria which has sensitivity of 75% and specificity of 100% to diagnose VT and exclude the pre excited tachycardia. The first step is to look for the predominantly negative QRS complexes in V4 - V6 if present favours the VT and if absent; the 2nd step is to look for QR complex in one or more of the precordial leads V2-V6 if present goes in favour of VT; If not go for third step which is to look for A V Dissociation (more QRS complexes than P waves) if present VT, if not pre-excited tachycardia.

So the correct diagnosis is pre-excitation tachycardia with AF with FVR was made with anti-grade conduction over the accessory pathway. The patient was given a DC shock and was reverted to sinus rhythm with ECG revealing WPW syndrome with left sided pathway. Fig:2

Figure 2
Figure 2: ECG after DC Shock (short PR with delta wave)

BBR tachycardia is wide QRS tachycardia with a well defined macro re-enterant circuit. It occurs more often in patients with dilated cardiomyopathy and are frequently symptomatic. This form has typically LBBB morphology although less common are RBBB morphology. The mechanism is antigrade conduction over the RBB and retrograde via the LBB.

Additional mechanism for wide QRS complex tachycardia in patients with AVRT that uses an AP as its anterograde limb; AF; or other atrial tachycardias with ventricular pre-excitation. During AF with a rapid ventricular response rate, however the characteristic pre-excited QRS pattern may be difficult to detect. Pre-excitation may be most evident in the QRS complex after the longest RR interval during irregular tachycardia. (4th complex of lead V6)

The short term treatment of wide QRS complex tachycardia
is first and foremost depends on patients haemodynamic compromise. In presence of haemodynamic compromise DC shock remains the choice as in our patient. In presence of stable haemodynamics several I.V antiarrythmic drugs are available. I.V procainamide is most widely used for this purpose. This agent not only alters the propagation across the AP, but may also directly restore normal sinus rhythm. Use of B Blockers/Lidocaine is not effective for either purpose. IV antiarrythmic drugs IC:III sotolol are effective in both slowing the ventricular response during AF and restoring sinus rhythm in patients with APs. I.V. amiodarone is also effective although time to act may be longer and overall the conversion rate may be low. Several I.V. agents may accelerate A.V conduction through AP. This agents include adenosine, digoxine, IV verapamil potentially causing AF to degenerate into VT, I.V but not oral Diltazem. 

References
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