Interesting Ecg- Wide Qrs Tachycardia - A Case Study

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On 4th September 2012, one patient, aged 67 years, a known case of DM with IHD (old AWMI with post CABG status-2000) presented with complaints of palpitation and uneasiness of ½ hour duration. He was conscious, oriented, cooperative gentleman, with pulse rate of 204/min, B.P. of 100/60 mm of hg. On

His R/S examination reveled clear chest and no abnormality was detected in any other systemic examination. On admission ECG showed following picture -wide QRS tachycardia.

Three-step clinical protocol to WCTs

1. If the patient is asymptomatic, or minimally symptomatic and hemodynamically stable, call an experienced electro cardiographer or look up the criteria … while observing the patient….

2. If the patient is hemodynamically unstable, immediate synchronized graded cardioversion … is indicated. Subsequent pharmacologic therapy can be guided by experienced physicians.

3. If the patient is symptomatic … but is otherwise hemodynamically stable, then controlled graded cardioversion or pharmacologic therapy [sic] … may be tried.

Table 1.

Electrocardiographic axis and WCTs

1. Abnormal QRS axis supports VT (particularly if newly abnormal)
2. Northwest axis (-90 degrees to +/- 180 degrees) strongly suggests VT
3. In V1-negative WCT, RAD strongly supports VT

Table 2.

Wellens' Criteria (VT favored in the presence of)1. AV Dissociation

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2. Left Axis Deviation
3. Capture or Fusion Beats
4. QRS generally greater than 140 msec
5. Precordial QRS concordance
6. RSR' in V1, mono- or biphasic QRS in V1, or monophasic QS in V6

Brugada's 4-step Algorithm Approach

This step-wise approach is performed as a series of questions. If the answer to any of these questions is "YES," VT is identified and no further steps are made. If the criteria are not met for that step, the next question is asked

1. If RS complex absent from all precordial leads, then VT
2. If RS present, and the longest precordial RS interval > 100 msec in one or more precordial lead(s), then VT
3. If atrioventricular dissociation present, then VT*
4. If morphological criteria for VT present both in precordial leads V1-2 and V6, then VT. If morphologic criteria for VT not present, then the diagnosis of SVT with aberrant conduction is made by exclusion.

Morphological criteria favoring VT

A.RBBB-like QRS:

monophasic R, QR, or RS in V1

R/S ratio less than 1.0, QS or QR in V6

* triphasic QRS in V1 or V6 supports SVT with aberrant conduction

B.LBBB-like QRS:

R > 30 msec, >60 msec to nadir S, or notched S in V1 or V2

QR or QS in V6

* monophasic R in V6 not helpful

C. Using V1(V2)-positive and V1-negative QRS morphology characteristics:

1. V1(V2)-positive:

V1: mono- or biphasic QRS = VT

Rabbit ear sign with first peak > second (L > R) = VT

rSR' (triphasic) = SVT + RBBB
V6: QS or deep S (R/S ratio < 1.0) = VT
qRS (triphasic) with R/S ratio > 1.0 = SVT + RBBB

2. V1-negative:
V1,2: broad r > 0.04 sec and/or slurred or notched S resulting in prolonged interval from beginning QRS to S nadir = VT
*narrow r wave and quick S wave downstroke = SVT + LBBB
V6: any q wave = VT

The Brugada criteria are perhaps slightly favored by clinicians and cardiologists may be because they are most recent. There are several aspects of medical h/o that contribute to a clinician's ability to identify the etiology behind WCT. Individuals with previous MI or K/C CAD are approximately four times more likely to present with ventricular rather than supraventricular etiologies of their WCT. Our patient was K/C CAD. His 2D ECHO showed akinetic, scarred and thinned out distal septum apex, hypokinetic anterior wall with global LVEF of 20%. The Electro-cardiographic axis is -130°, which strongly suggest VT. Going by the Wellen's criteria the above ECG fulfills 3 criteria's favoring VT.

Applying Brugada's 4 Step algorithm approach to above ECG reveals A-V dissociation and Monophasic R in V1. Rabbit ear sign in V2 with first peak>second.

Our patient was treated with injectable Xylocard 5 cc(50 mg) IV stat. There was no response, hence the same dose was repeated. Then injectable Cordarone 150mg IV bolus over 10 minutes was given. There was no response again. Medical management was not helpful hence electrical D.C. Cardioversion of 360 J was given after sedation. Hence after the rhythm reverted to NSR. Later on AICD implantation was done to prevent future such episodes.