NARROW-COMPLEX PRESENTATION OF VENTRICULAR TACHYCARDIA

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Introduction: Tachyarrhythmia is common in emergency or intensive care unit which occurring in 12 – 20% of all patients. It is often difficult to differentiate the origin of tachyarrhythmia between ventricular or supraventricular based on electrocardiographic findings. The distinction between Supraventricular Tachycardia (SVT) and Ventricular Tachycardia (VT) is critical because inappropriate acute management of a VT often results in poor outcome. Almost all of diagnostic criteria are used for differentiating VT from SVT with aberrancy in wide-complex tachycardia form, while narrow-complex tachycardia is almost always considered as an SVT. However, there is a VT involving His-Purkinje re-entry path that produces relatively narrow QRS-complex.

Methods: CASE DESCRIPTION: A 84-years-old female came to our emergency department, complaining shortness of breath. This patient had history of advanced HF (NYHA functional class IV). Her shortness of breath deteriorated and accompanied with upper back discomfort within last week. She was tachycardic (Heart Rate 140 bpm) and dyspneic (Respiratory Rate 32/min) with Blood Pressure 108/69 mmHg and 99% SaO2 in simple mask oxygenation. A 12-lead electrocardiogram (ECG) showed a regular, monomorphic, relatively narrow QRS complex (QRS duration 136 ms) tachycardia with RBBB morphology, left superior axis (frontal axis -70o), and also there were several fusion beats and atrioventricular (AV) dissociation (Fig. 1). Chest radiography showed cardiomegaly and early pulmonary edema. Intravenous loading continued with continuous infusion of amiodarone was given to her. Her ECG then converted to sinus rhythm with different QRS morphology and axis from tachycardia episode (Fig. 2).

Result: DISCUSSION: Her surface ECG didn't show typical form of VT, such as concordance of the QRS complex in all precordial lead, R-S interval > 100 ms, Josephson's sign, or initial R in aVR. Diagnostic algorithms including Brugada, Vereckei, Griffith, Bayesian, or R-wave Peak Time are used for wide-complex tachycardia. Understanding of traditional criteria of VT is very useful in the setting of narrow complex presentation (Table 1). The presence of AV dissociation and fusion beat is quite specific for VT. RBBB morphology with left axis and qR pattern in V1 in relatively narrow (< 140 ms) QRS-complex consistent with fascicular VT (FVT). Based on Segal criteria2 (Fig. 3), the ectopic focus came from posterobasal or posteromedial origin, as well as posterior fascicular VT is the most common among FVT. Verapamil wasn't chosen to terminate her VT because of its cardiac depressive effect.

Conclusion: Fascicular VT is present in relatively narrow complex VT involving Left Ventricle His-Purkinje system, usually the left posterior fascicle. Differentiating FVT from SVT is often difficult with the usual diagnostic algorithm. Understanding traditional criteria of VT is useful to diagnose FVT and lead to the best treatment to terminate.