Chapter 8

ELECTROCARDIOGRAPHIC FINDINGS OF NARROW QRS COMPLEX TACHYCARDIAS

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Introduction

Twelve derivation electrocardiography (ECG) obtained both during sinus rhythm and tachycardia may give important clues about the tachycardia mechanism. Information obtained from ECG may be valuable for clicical diagnosis and may increase the safety and success of electrophysiological study (EPS) and ablation procedures.

Tachycardia with QRS duration <120 ms is considered to be a 'narrow QRS complex tachycardia' and tachycardia with QRS duration ≥ 120 ms is considered to be a 'wide QRS complex tachycardia' on surface ECG. Narrow QRS complex tachycardias are usually of supraventricular origin; however certain rare type ventricular tachycardias (VT) may also manifest themselves with narrow QRS on ECG. Differential diagnosis for the wide QRS complex tachycardia includes VT, aberrantly conducted supraventricular tachycardia (SVT) and preexcitation.

In this chapter norrow QRS complex tachycardias will be evaluated and clues from surface ECG will be emphasized for each type of narrow QRS complex tachycardia.

Electrocardiography In Narrow QRS Complex Tachycardias

Irregular Narrow QRS Complex Tachycardia:

Common causes of narrow QRS complex tachycardia with irregular ventricular activation include atrial fibrillation (AF), multifocal atrial tachycardia (MAT) and atrial tachycardia related with irregular ventricular conduction. Atrial fibrillation is characterized by irregular and continuous atrial activation without discernible isoelectrical line on surface ECG. Irregular atrial activation is conducted to ventricles irregularly by AV node and ventricular activation also becomes irregular (QRS complexes with irregularly irregular time intervals). In MAT different autonomic foci stimulate atrium at different rates, however there is discernible isoelectric line between atrial depolarizations. In atrial tachycardia related with irregular ventricular conduction there is rapid and repetitive atrial activation and variable conduction through AV node gives rise to irregular ventricular activation.

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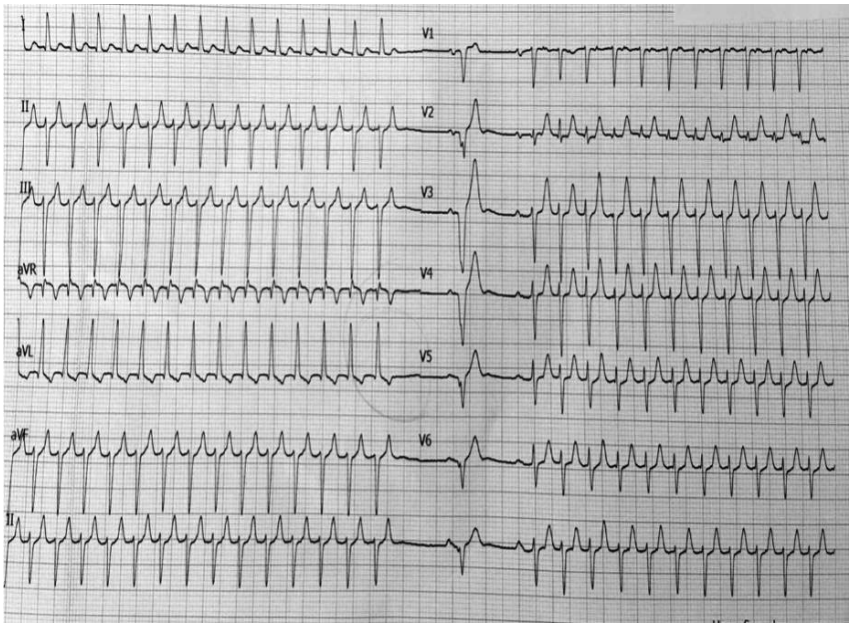

Figure 8: *ECG tracing of a patient with orthodromic AVRT. Tachycardia teminates with p wave. In the middle a preexcited beat is seen. A parahisian accessory pathway was identified in this patient during electrophysiological study. After preexcited beat tachycardia initiates with long PR interval. It is possible that tachycardia uses slow pathway as antegrade limb and accessory pathway as retrograde limb during the tachycardia. Note the alteration in QRS voltage during the tachycardia which also suggests AVRT.*

Conclusion

A careful examination of ECG during narrow QRS complex tachycardia usually gives important clues for the diagnosis. Configuration of p waves and QRS complex and their relationship with each other should be examined during tachycardia. Initiation and termination of tachycarda may also give important clues related with mechanism of narrow QRS complex tachycardia. Examination of ECG obtained during sinus rhythm may facilitate recognition of subtle alterations during tachycardia. Information obtained from ECG is valuable for diagnosis and appropriate therapy of narrow QRS complex tachycardias.

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