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IMAGES IN ELECTROPHYSIOLOGY

Bidirectional ventricular tachycardia in fulminant myocarditis

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A 14-year-old girl (176 cm, 60 kg) was referred to our hospital with acute heart failure. She had a history of dyspnoea during a week. She developed orthopnoea and palpitations on the day of admission. The ECG of the referring hospital showed a bidirectional ventricular tachycardia (VT) (*Figure 1A*). She was transferred to our intensive care unit. After administration of amiodarone (300 mg/2 h followed by 900 mg/24 h iv), sinus rhythm was restored. Marked ST elevation became apparent in all leads (*Figure 1B*). After stabilization another ECG showed ventricular bigeminy (*Figure 1C*). Echocardiography was suggestive for acute myocarditis. Fulminant myocarditis was proven by endomyocardial biopsy. No aetiological agents could be withheld. After 4 days, our patient developed cardiogenic shock and an assist device was placed. She was successfully transplanted 58 days after the diagnosis.

Distinction between acute and fulminant acute myocarditis is important in view of the difference in presentation and outcome. Fulminant myocarditis is associated with critical illness and rapid deterioration to cardiovascular collapse.[1] Ventricular arrhythmias are common. Bidirectional VT is a rare rhythm disorder that is usually described in digitalis intoxication, but is also seen in ischaemic heart disease, hypokalaemia, myocarditis, and familial catecholaminergic polymorphic VT.[2,3] Experimental data in a canine ventricular wedge preparation suggest that the underlying mechanism of VT in these cases is ectopic discharges by triggered activity mainly in the epicardium.[4] In these experiments, bidirectional VT and polymorphic VT are preceded by multiple ectopic beats, increasing transmural dispersion and creating a substrate for VT. In view of the presence of multiple ventricular extrasystoles, our case is illustrative for this pathophysiological mechanism. Distinction between bidirectional VT (*Figure 1A*) and ventricular bigeminy (*Figure 1C*) can be difficult. In *Figure 1C*, QRS complexes identical to the ones in sinus rhythm (*Figure 1B*) with a normal PR can be clearly distinguished from other QRS complexes with a very short PR suggestive of ventricular extrasystoles. In contrast, in *Figure 1A*, none of the QRS complexes resemble sinus rhythm and there might in some complexes be a suggestion of a retrograde P-wave shortly after the QRS, both indicative for bidirectional VT.

Conflict of interest: none declared.

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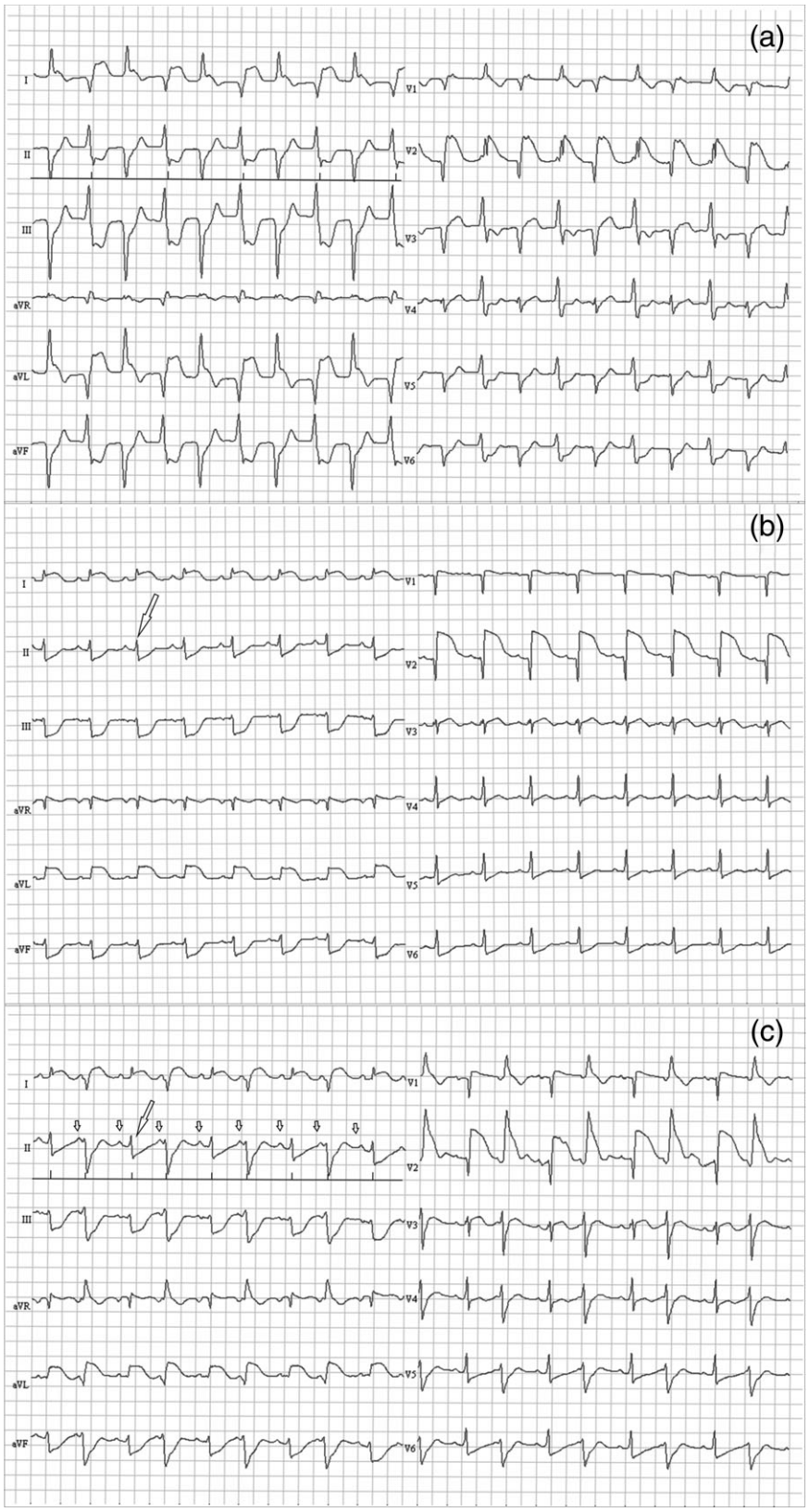

Figure 1 (*A*) Bidirectional ventricular tachycardia at 117 per minute. QRS complexes differ from (*B*) and (*C*). Constant RR interval is seen. (B) ECG in sinus rhythm at 97 per minute. Manifest ST- T changes with elevation anteroseptal and depression inferior and anterolateral. Identical QRS complex in (C) (big arrow). (C) Ventricular bigeminy with sinus rhythm at 110 per minute. QRS complex is identical at the complexes seen in (B). Notice the changing RR intervals. Identical QRS complex in (B) (big arrow). P-waves are indicated by small arrows.