Electrocardiographic Case – A Man with Recurrent Syncope and Aborted Sudden Death

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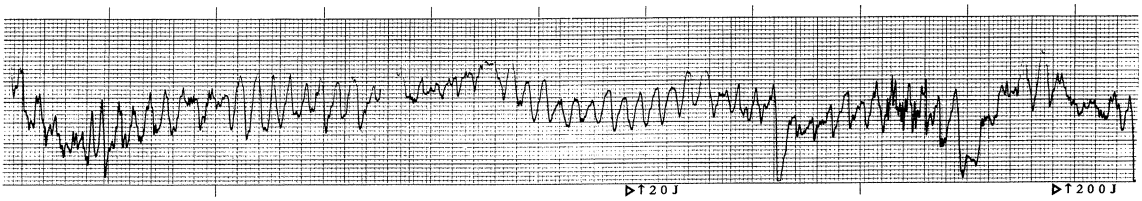

Fig 1 – ECG at time of collapse

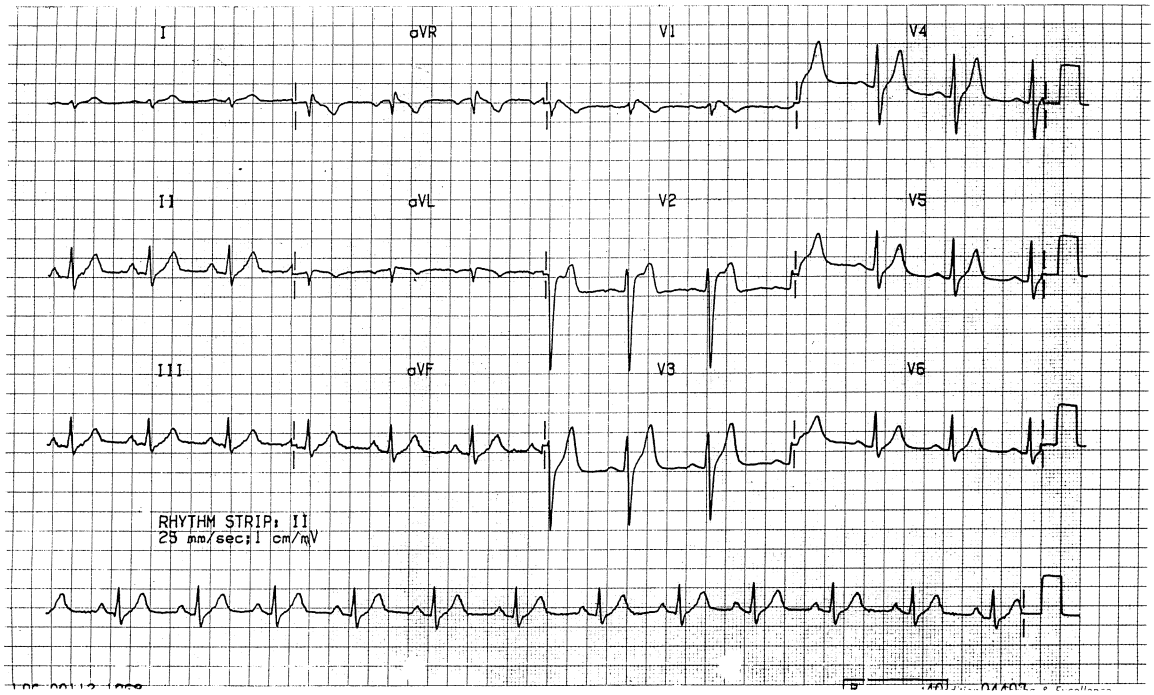

Fig 2 – 12-lead ECG

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CASE REPORT

TCT, a 77-year-old man, presented to the Accident and Emergency Department of our hospital with recurrent episodes of syncope within a day. Initially in sinus tachycardia, subsequent electrocardiograms (ECG) showed frequent R-on-T phenomenon, and then ventricular fibrillation (Fig 1), from which he was immediately resuscitated.

He had a one-year history of sporadic syncopal attacks. He also had chronic hypertension and Parkinson's disease, and was on atenolol and benzhexol. Previous investigations at another hospital revealed a normal echocardiogram and occasional unifocal ventricular premature beats on 24-hour Holter monitoring.

The 12-lead ECG post-resuscitation is shown in Fig 2. What is the diagnosis?

Diagnosis
Brugada Syndrome

DISCUSSION

The initial ECG in Fig 1 shows ventricular fibrillation. The causes of ventricular fibrillation are protean[1]: ischaemic, structural, inflammatory and infiltrative heart diseases, long QT syndrome (hereditary and acquired), ventricular pre-excitation, arrhythmogenic right ventricular dysplasia and drugs. Sometimes no obvious cause can be elucidated (idiopathic ventricular fibrillation).

The 12-lead ECG in Fig 2 shows a characteristic pattern of right bundle branch block and ST segment elevation in leads V1 to V3. This ECG appearance constitutes a recently-described syndrome – Brugada syndrome – that is associated with a high risk of ventricular fibrillation and sudden cardiac death.

In 1992, Brugada and Brugada[2] published a series of 8 patients with aborted sudden death, without evidence of organic heart disease or QT prolongation, who shared a distinct surface ECG morphology (described above). It may also occur in previously asymptomatic individuals, who are similarly at risk of sudden cardiac death[3]. Familial clustering of this syndrome has been reported[2, 4]. Recently, this syndrome has been postulated to be similar to the sudden unexplained death syndrome (SUDS) in Thai men[5, 6].

The cause of Brugada syndrome is unclear. Various mechanisms, such as intraventricular conduction disturbance and sympathetic imbalance, have been postulated. Interestingly, the ECG appearance is amenable to modification by some adrenergic drugs and anti-arrhythmic agents[7].

Recognition of this syndrome is extremely important. The ST elevations are often erroneously diagnosed as "benign early repolarisation changes". In a patient with unexplained syncopal episodes, the coexistence of this ECG syndrome mandates aggressive intervention. The failure of current anti-arrhythmic medication to prevent arrhythmogenic deaths in patients with Brugada syndrome makes the implantable cardioverter defibrillator (ICD) the treatment of choice.

In this patient, the serial ECGs and cardiac enzymes done showed no evidence of a myocardial infarction. A coronary angiogram done showed single vessel disease involving the obtuse marginal branch of the left circumflex artery. It was felt that ischaemia per se did not contribute to the cardiac arrest. The diagnosis of Brugada syndrome was confirmed by an electrophysiologic study, which demonstrated repeatedly-inducible ventricular fibrillation. The patient later underwent successful ICD implantation.

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