Intractable Ventricular Tachycardia Associated With Stress Cardiomyopathy

Eun-Sun Jin, MD, PhD
Cardiovascular Center, Kyung Hee University Hospital at Gangdong, Seoul, Korea

ABSTRACT
A 75-year-old woman presented with medically intractable wide QRS tachycardia. She had experienced chest discomfort during a vertebral procedure and was transferred to our hospital. Electrocardiography showed sustained wide QRS tachycardia, which persisted in various QRS axes despite the repeated administration of electrical shock. Through amiodarone infusion and repeated shock delivery, the cardiac rhythm was stabilized to a sinus rhythm. Thereafter, the sustained ventricular tachycardia, for which electrical shock was necessary, occurred repeatedly for 12 hours, but then decreased in frequency and disappeared in 3 days. Echocardiography revealed akinesia of the entire left ventricular apical segment, and coronary angiography showed minimal coronary disease, which was compatible with a diagnosis of stress-induced cardiomyopathy. The patient recovered with general supportive care. Follow-up echocardiography revealed normalized left ventricular wall motion and systolic function.

Key Words: ■ Takotsubo cardiomyopathy ■ tachycardia ■ ventricular

Introduction

Stress cardiomyopathy (SCM)—also known as Takotsubo cardiomyopathy—is a common clinical condition with a clinical presentation that similar to acute myocardial infarction. Such patients may present with chest pain, ST changes on electrocardiography (ECG), elevated cardiac enzyme levels, and regional wall motion abnormalities of the left ventricular wall. However, the coronary arteries appear normal in such cases and the prognosis is good. Patients with SCM also present with QT prolongation on ECG. However, only a few cases of SCM presenting with ventricular tachycardia (VT) associated with long QT have been reported. In the present report, we describe a case of a 75-year-old patient with medically intractable monomorphic VT associated with SCM.

Case
A 75-year-old woman was transferred to the emergency room of our hospital for chest dis-
comfort that developed during neuroplasty for lumbar spinal stenosis. She was receiving medication for diabetes mellitus and hypertension. Upon arrival to the emergency room, her ECG showed a sustained wide QRS tachycardia of 150 bpm. Her blood pressure was 90/50 mmHg. We suspected the presence of monomorphic VT, and hence, electrical shock was delivered. After repeated administration of electrical shock, the QRS axis changed, but the wide QRS tachycardia persisted (Figure 1). Most of the VTs were monomorphic, but occasionally, the QRS axis changed spontaneously (Figure 2). The patient underwent electrical shock more than 30 times within 12 hours to terminate the recurrent VT. Because the QT interval of the sinus rhythm was normal (Figure 3), amiodarone was infused for the recurrent VT. Subsequently, VT changed to the nonsus-

Figure 1. Sustained wide QRS tachycardia even after an electrical shock. Occasionally, the QRS axis changed after an electrical shock.

Figure 2. Spontaneous QRS axis changes during wide QRS tachycardia.
**Figure 3.** Electrocardiography in sinus rhythm showed no QT prolongation (A). 1 month later, ECG showed better R wave progression and T wave change without QT prolongation in precordial leads (B).

**Figure 4.** Coronary angiography showing no significant stenosis.
tained form and then gradually resolved.

Thereafter, echocardiography showed akinesia of the middle and apical wholsegments. Ex-tensive ischemia of the left anterior descending artery was suspected, but the findings were also compatible with stress—induced cardiomyopathy. In addition, coronary angiography indicated no significant stenosis (Figure 4).

Amiodarone administration was discontinued because of the development of QT prolongation during drug infusion. With supportive treatment, the left ventricular function and wall motion normalized, and VT did not recur. The patient was discharged without any medication. ECG which was taken 1 month after discharge showed better R wave progression with T wave change without QT prolongation in precordial leads (Figure 3B).

Discussion

SCM is a commonly encountered disease, characterized by its initially severe presentation, followed by a mild clinical course. On presentation, it is often misdiagnosed as myocardial infarction. The most distinguishable clinical aspects of this disease are the absence of coronary artery stenosis and a good prognosis. Although myocardial infarction is the most common cause of sudden cardiac death, the mortality rate of SCM in hospitals ranges from 1% to 2%.1,3

A potentially dangerous clinical presentation of SCM is torsades de pointes coinciding with QT prolongation, which is often accompanied by hypokalemia.3 However, cases of sustained VT causing cardiac death are uncommon.

In the present case, the patient showed recurrent, sustained VT of both the monomorphic and polymorphic forms, with the monomorphic form occurring more frequently. In the sinus rhythm, QT was not prolonged and the serum potassium level was 3.5 mmol/L. Although prolonged QT with polymorphic VT is a common ECG finding in cases of SCM, monomorphic VT may also develop. Because the proposed mechanism of SCM involves microvascular myocardial ischemia,

Medical treatment for sustained VT can be adjusted according to the VT mechanism. Amio-
darone infusion is not used for treating cases of torsades de pointes with long QT, but can be used for treating cases of monomorphic VT with no QT prolongation that may be associated with microvascular myocardial ischemia.

Although a patient may experience life—threatening sustained VT resulting from SCM, placement of an implantable cardioverter-defibrillator is not recommended because SCM is considered a reversible, self—limited disease. Nevertheless, 11% of patients experience symptom recurrence after a 4—year follow—up period.6 Thus, large—scale, long—term follow—up data are needed to estimate the recurrence of life—threatening VT caused by SCM.

References