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A Rare Case of Second-degree Atrioventricular Block and Takotsubo Syndrome

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ABSTRACT

Background: Takotsubo cardiomyopathy is characterized by transient left systolic dysfunction that can mimic acute myocardial infarction. Atrioventricular (AV) block associated with Takotsubo is rare, but a few cases have been reported in recent years.
Methods: We present the case of a 77-year-old woman presenting with second-degree AV and Takotsubo syndrome.
Results: The diagnosis of Takotsubo syndrome was based on echocardiogram changes and the absence of coronary artery obstruction on coronary angiography.
Conclusions: We describe a patient with a diagnosis of Takotsubo syndrome and AV conduction defect. These conditions rarely occur simultaneous, but when they do, a dilemma arises regarding pacemaker implantation.

LEARNING POINTS

- Takotsubo syndrome is a rare disorder that can mimic acute myocardial infarction.
- Takotsubo syndrome normally resolves by itself, but the associated arrhythmias may need treatment and pacemaker implantation.
- The timing of pacemaker implantation has to be evaluated on a case-by-case basis.

KEYWORDS

Takotsubo, atrioventricular, pacemaker

INTRODUCTION

Takotsubo cardiomyopathy is characterized by transient left systolic dysfunction that can mimic an acute myocardial infarction, but with no signs of coronary artery disease on angiography [1]. This syndrome usually occurs secondary to emotional or physical stress [1, 2].
The prognosis is normally good, but, in certain cases arrhythmias and even death can result. Atrioventricular (AV) block associated with Takotsubo is rare but a few cases have been reported in recent years [2]. The mechanism causing this condition is unclear, but some authors suggest that it could be due to diffuse spasms of the coronary arteries [2].
Although Takotsubo syndrome resolves by itself within days or weeks, this may not be the case with the associated AV. Consequently, the timing of pacemaker implantation is controversial.
We present a case of Takotsubo syndrome associated with second-degree AV block and describe management strategies for this rare association.

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CASE DESCRIPTION

We report the case of a 77-year-old woman with a medical history of arterial hypertension and dyslipidaemia. The patient had undergone hip replacement and was discharged from hospital 4 days later with the recommendation to see her attending doctor because her heart was "beating slowly". She was immediately referred by her attending doctor to the emergency department (ED). An electrocardiogram (EKG) was performed, revealing second-degree AV block and ST segment elevation in V2 and V3. Blood chemistry showed no elevation in cardiac markers of necrosis. The patient did not report any syncope, dizziness, chest pain or dyspnoea. The echocardiogram showed apical akinesia with hypokinesia of the distal septum and anterior and inferior distal wall, with hypercontractility of the other segments, and depression of the ejection fraction (36%). The patient was admitted with the diagnosis of myocardial infarction or Takotsubo syndrome. To confirm the diagnosis, she was submitted to coronary angiography, which showed no signs of coronary obstruction. After a week, another echocardiogram showed the ejection fraction had returned to normal (53%), although there was still evidence of apical hypokinesia. The rest of the segments also had normal contractility. Accordingly, the results of the echocardiograms and coronary angiography indicated the diagnosis of Takotsubo was most likely.

During her stay in the hospital, the patient remained stable and asymptomatic. The EKG changes improved over time and as did the AV block and ST elevations.

Three months after discharge, the patient returned to ED because of a presyncope episode associated with bradycardia. An EKG was performed in the ED and revealed second-degree AV block. A permanent pacemaker was placed. The patient is currently stable.

DISCUSSION

Takotsubo syndrome was first described in Japan in 1991 [1]. Clinically, it is also called stress cardiomyopathy because it is normally precipitated by emotional or physical stress. The pathophysiology remains unclear but there may be excessive activation of the sympathetic axis, which leads to a rise in catecholamine levels [3]. Other theories include diffuse coronary spasm and microvascular dysfunction [2, 3]. The relationship between Takotsubo cardiomyopathy and arrhythmias remains unknown, although some authors have speculated that diffuse coronary spasm can affect the conduction system of the heart, thus causing AV disturbance [2-4]. The alterations that present with Takotsubo syndrome are normally transient, so disturbances in the conduction system should also return to normal. However, it is possible that the conduction system does not recover at the same time as the contractile system.

In our case, the patient had received a hip replacement, a physical stress that probably caused the stress cardiomyopathy and consequently the second-degree AV block. This case is intriguing as the patient had a normal EKG at discharge, so the conduction system had recovered at the same time as the contractile system. However, after 3 months, the patient developed symptoms and AV block was again detected, leading to implantation of a permanent pacemaker.

AV conduction defects and Takotsubo syndrome rarely occur simultaneously, but when they do, a dilemma arises concerning the implantation of a pacemaker. There are no guidelines concerning the need for and timing of pacemaker implantation, so this decision should be made on a case-by-case basis. Takotsubo syndrome normally has a good prognosis, but careful management is required when it is associated with arrhythmias.

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