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Case Report

A case of complete atrioventricular block: The use of magnetic resonance imaging conditional pacemakers for diagnosing cardiac sarcoidosis



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ABSTRACT

A 50-year-old man presented to the emergency department with repeated episodes of faintness and exertional dyspnea, and was found to have an atrioventricular (AV) block. Chest radiography and transthoracic echocardiography results were normal, without any evidence of heart failure, wall motion abnormalities, interventricular septum thinning, or bilateral hilar lymphadenopathy. A temporary pacemaker was implanted, followed by a permanent pacemaker. Chest computed tomography with contrast enhancement did not show abnormalities, including patent coronary arteries, lymph node adenopathy, and pulmonary abnormalities. Thus, an MRI conditional dual chamber pacemaker and leads were implanted. Six weeks following the implant, a cardiac MRI was performed to test for cardiac sarcoidosis. Although cine imaging showed normal left and right ventricular function, late gadolinium enhancement demonstrated multiple enhanced uptakes. Based on the results of the cardiac MRI, PET, and gallium scintigraphy, the most likely diagnosis was cardiac sarcoidosis. Although no abnormal findings were found on physical examination, blood work, chest radiography, and transthoracic echocardiogram, multiple regions of delayed enhancement were observed in the cardiac MRI. Thus, MRI conditional pacemakers are a useful tool for diagnosing cardiac sarcoidosis and early therapeutic intervention.

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1. Introduction

Cardiac sarcoidosis is a known cause of atrioventricular (AV) block, especially in younger people. Its progression can lead to ventricular tachycardia or heart failure [1]. Steroid therapy or immune suppressive therapy is moderately effective in the treatment of cardiac sarcoidosis [2,3], provided it is diagnosed early.

Cardiac MRI is an important diagnostic tool for cardiac sarcoidosis [4]. However, until recently, since MRI conditional pacemakers and ICDs were approved for use, the use of MRI was contraindicated in patients with implanted devices [5,6].

Here we present a case of a patient who presented with a complete AV block and underwent MRI conditional pacemaker implantation. A subsequent cardiac MRI suggested a likely diagnosis of cardiac sarcoidosis.

2. Case report

A 50-year-old man presented to the emergency department with repeated episodes of fainting and exertional dyspnea for 10 days, and was found to have an AV block. Chest radiography and transthoracic echocardiography results were normal, without any evidence of heart failure, wall motion abnormalities, interventricular septum thinning, or bilateral hilar lymphadenopathy. A temporary pacemaker was implanted, followed by a permanent pacemaker. Subsequent chest computed tomography (CT) with contrast enhancement did not show any abnormalities, including patent coronary arteries, lymph node adenopathy, and pulmonary abnormalities. An MRI conditional dual chamber pacemaker and leads (Advisa DR MRI™ SureScan™ with 5086 leads; Medtronic, Minneapolis, USA) were thereafter implanted (Fig. 1). Six weeks following the implant, a cardiac MRI was performed to test for cardiac sarcoidosis. Although cine imaging showed normal left and right ventricular function, late gadolinium enhancement demonstrated multiple enhanced uptakes (Fig. 2). Gallium scintigraphy revealed multiple uptakes in the heart, along with axillary and inguinal lymph nodes (Fig. 3). A PET-CT of the heart demonstrated

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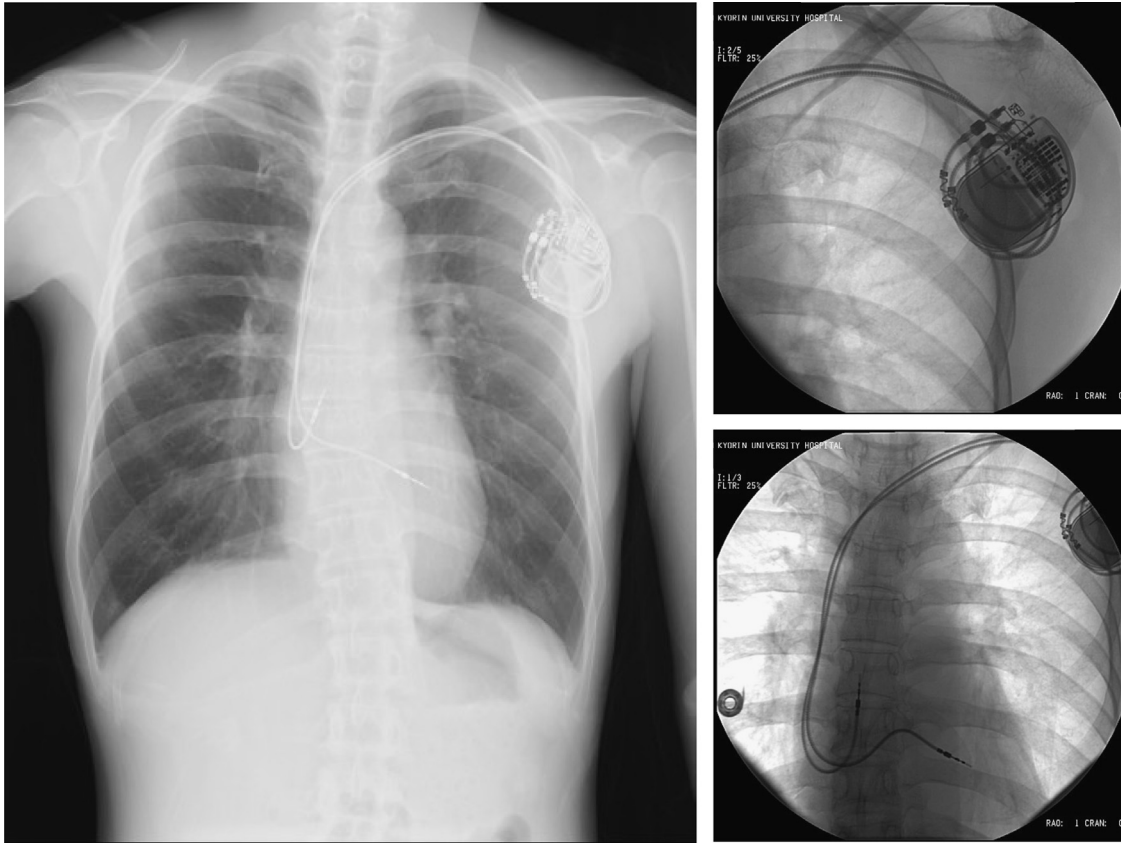


Fig. 1. Chest radiography following MRI conditional pacemaker implantation. No abnormal findings are seen in the lungs.

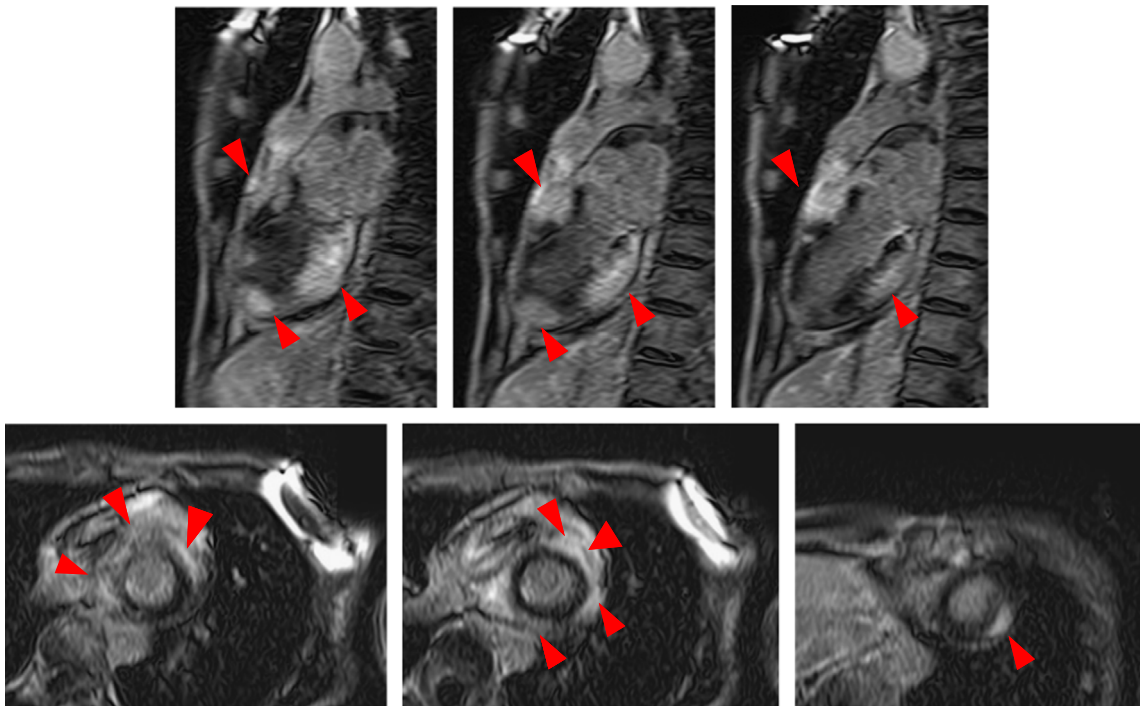


Fig. 2. Cardiac MRI with gadolinium enhancement. Left and right ventricular function is normal, but multiple areas with delayed enhancement are observed in the basal anteroseptal, lateral, and apical regions (shown by red arrows).

multiple enhanced uptakes appearing on the interventricular septum and left ventricular free wall (Fig. 4).

The serum levels of the angiotensin-converting enzyme, lysozyme, and other laboratory parameters were within normal range.

We were unable to obtain consent for the endocardial or lymph node biopsy, but considering the results of the cardiac MRI, PET, and gallium scintigraphy, the most likely diagnosis was cardiac sarcoidosis.

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