

Safety And Utility Of Cardiac MRI In A Patient With Pericardial Effusion And A Recently Implanted Conventional Pacemaker

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Abstract

Cardiac MRI is usually not recommended in the acute phase after pacemaker implantation, particularly for conventional devices. This case concerns a 66-year-old patient who developed significant pericardial effusion subacutely after implantation of a dual-chamber, conventional pacemaker. Cardiac MRI was planned to elucidate the characteristics of the pericardial effusion and was performed under controlled conditions without any consequences. Images analysis was very helpful to reveal the non-hemorrhagic nature of the pericardial effusion and correct endocardial position of the leads. In conclusion, cardiac MRI might be feasible and useful, under controlled conditions, in selected non-pacing dependent patients with conventional pacemakers.

Introduction

A 66-year-old man with paroxysmal atrial fibrillation and sick sinus syndrome was referred to our center for pacemaker implantation. Basal trans-thoracic echocardiogram showed no structural abnormalities. The patient underwent uneventful implantation of a dual-chamber, conventional (non-MRI conditional), pacemaker (Medtronic/Adapta). Atrial and ventricular active fixation leads were implanted in the right appendage and ventricular apex, respectively. Before discharge, device interrogation and chest x-ray confirmed optimal parameters and positioning of the both leads. Two weeks later, the patient presented with chest discomfort and exertional dyspnea. Vital signs were stable, and 12-lead ECG showed normal sinus rhythm. Echocardiogram demonstrated abundant pericardial effusion (the asterisk in Fig.1A) without echocardiographic evidence of hemodynamic instability. Fluoroscopy check, chest x-ray, and device interrogation showed correct location and functioning of the pacemaker system.

To elucidate the underlying mechanism of this pericardial effusion, whether it was secondary to a breach in the myocardial wall or a reactive inflammatory process in the presence of active fixation leads; a

cardiac MRI was planned. After discussion with our radiologists, this imaging technique was preferred to CT imaging since it may provide better visualization of the pericardial sac, and characterization of soft tissues and pericardial effusions.^{1,2} Considering the theoretical risk of recent leads torsion /movement, MRI is usually not recommended in the acute phase after device implantation, particularly for non-MRI conditional devices.³ However, cardiac MRI was programmed in this case through an ongoing strict protocol by our equip that tests MRI safety/efficacy in non-pacing dependent patients with conventional devices under controlled conditions. After detailed discussion with the patient and obtaining his informed consent, 1.5 Tesla cardiac MRI was performed three weeks after the implantation. During MRI, the pacemaker was programmed to backup VVI pacing (40 bpm) with continuous electrocardiographic and saturation monitoring, and in the presence of a senior electrophysiologist during the entire exam. The MRI exam was accomplished without any consequences regarding both the patient and the pacemaker functioning.

Images analysis revealed non-hemorrhagic nature of the pericardial effusion, and correct endocardial position of the right ventricular lead tip (the arrows in Fig.1B/C). Successively, and due to the persistent, abundant and symptomatic pericardial effusion despite pharmacological therapy; elective pericardiocentesis was planned. The analysis of the pericardial fluid confirmed the cardiac MRI findings and the non-hemorrhagic nature of the effusion. An echocardiogram performed two weeks after the drainage showed only minimal posterior effusion (the asterisk in Fig.1D).

Key Words:

Cardiac MRI, Conventional Pacemaker, Pericardial Effusion.

Disclosures:
None.

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Conclusions

In conclusion, cardiac MRI might be feasible and useful, under

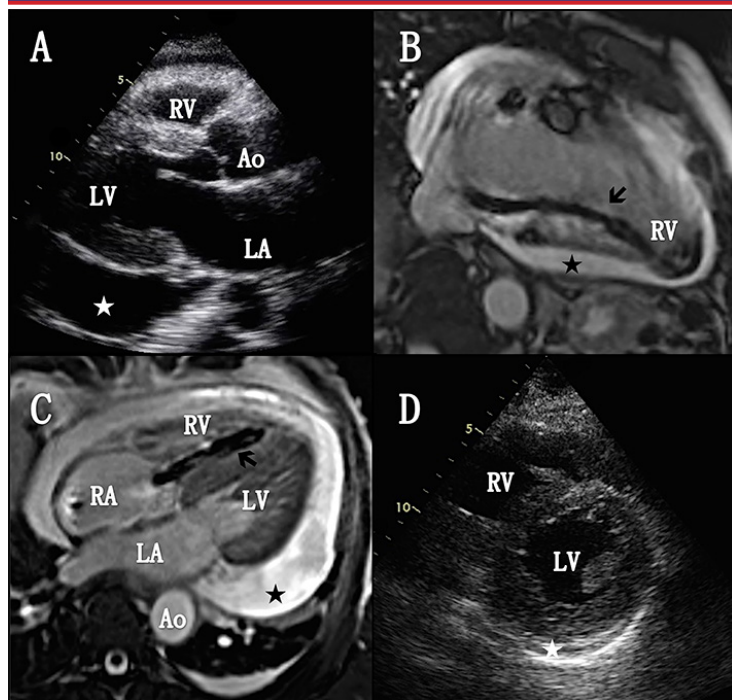


Figure 1:

A: An echocardiogram image showing abundant pericardial effusion (the asterisk).
B and C: Cardiac MRI showing the pericardial effusion (the asterisk) and correct intracardiac location of the ventricular lead tip (the arrow).
D: Echocardiogram control two weeks after pericardiocentesis showing minimal residual pericardial effusion (the asterisk).
 Ao = aorta; LA = left atrium; LV = left ventricle; RA = right atrium; RV = right ventricle

controlled conditions, in selected non-pacing dependent patients with conventional pacemakers to characterize the nature of pericardial effusion and the position of intracardiac leads. A careful risk-benefit analysis should be individualized for each case, and the patient should be informed about the potential risks and alternative options.

References

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