

Tricuspid leaflet flail after Micra™ leadless pacemaker implantation: a case report

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Background

Currently, the leadless pacemaker indications are limited to few and highly selected cases.

Case summary

We describe the first reported case of an atrioventricular Micra™ leadless pacemaker implantation complicated by tricuspid posterior leaflet flail with severe regurgitation in a 29-year-old man affected by asymptomatic and progressive high degree atrio-ventricular block. The patient was then treated with endoscopic tricuspid valve repair, leadless pacemaker removal and implantation of an epicardial pacemaker.

Discussion

Leadless pacemaker complications are multiple, hence it is essential to ensure a safe procedure, especially in the younger patients. We thought that the application of a transesophageal echocardiography guidance might mitigate the risk of major complications.

Keywords

Atrio-ventricular block • Leadless pacemaker • Micra device • Tricuspid leaflet flail • Echocardiography • Endoscopic cardiac surgery

ESC Curriculum

2.1 Imaging Modalities • 2.2 Advanced Echocardiography • 4.3 Valvular Heart disease: Mitral Regurgitation • 4.5 Valvular Heart disease: Tricuspid Regurgitation • 8.1 Sports Cardiology

Learning points

- Currently, the leadless pacemaker indications are limited to few and highly selected cases because of the absence of long-term data, hence it is mandatory to evaluate accurately if appropriate before proceeding with the implantation, especially in the younger patients.
- Leadless pacemaker complications are multiple, such as cardiac tamponade and ventricular arrhythmias; among these, we have also documented severe tricuspid regurgitation due to iatrogenic tricuspid flail leaflet.
- Of prime importance are adequate training and individuating the right strategy to further improve the procedure safety. We thought that the application of a transesophageal echocardiography guidance might mitigate the risk of major complications.

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Timeline

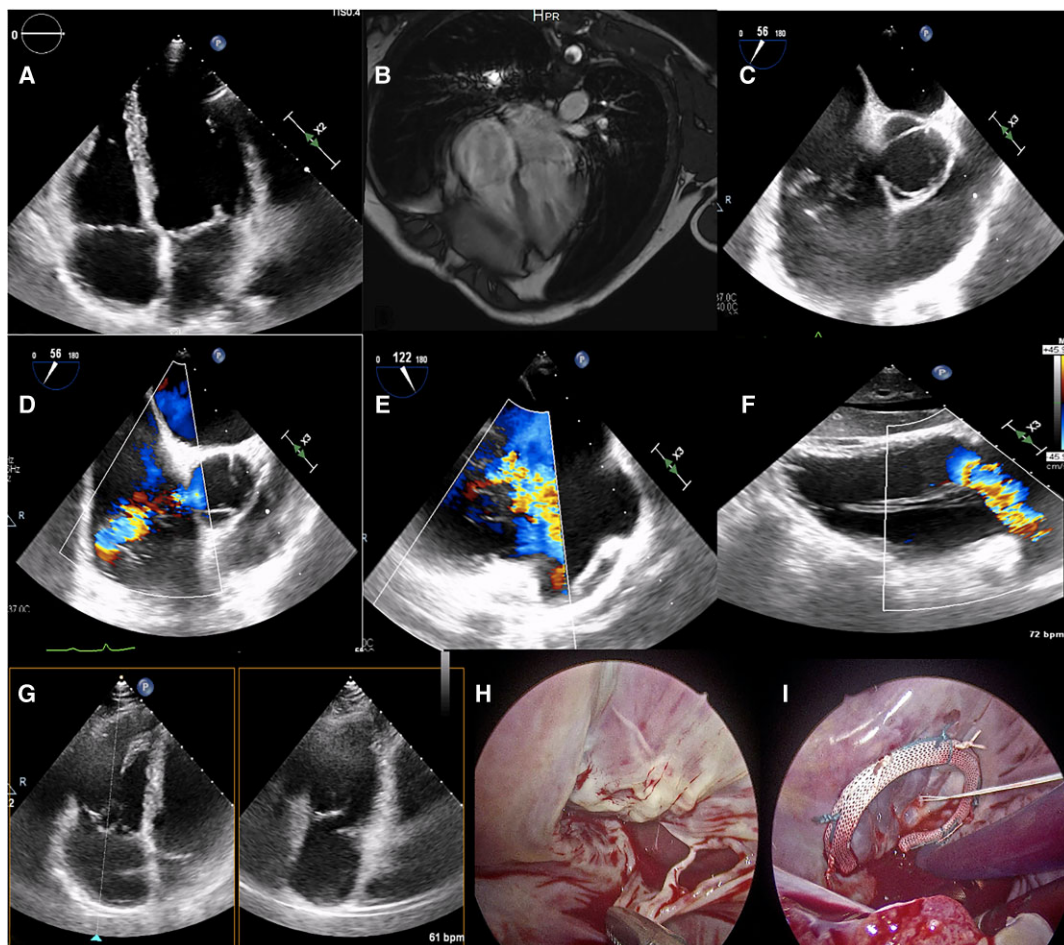
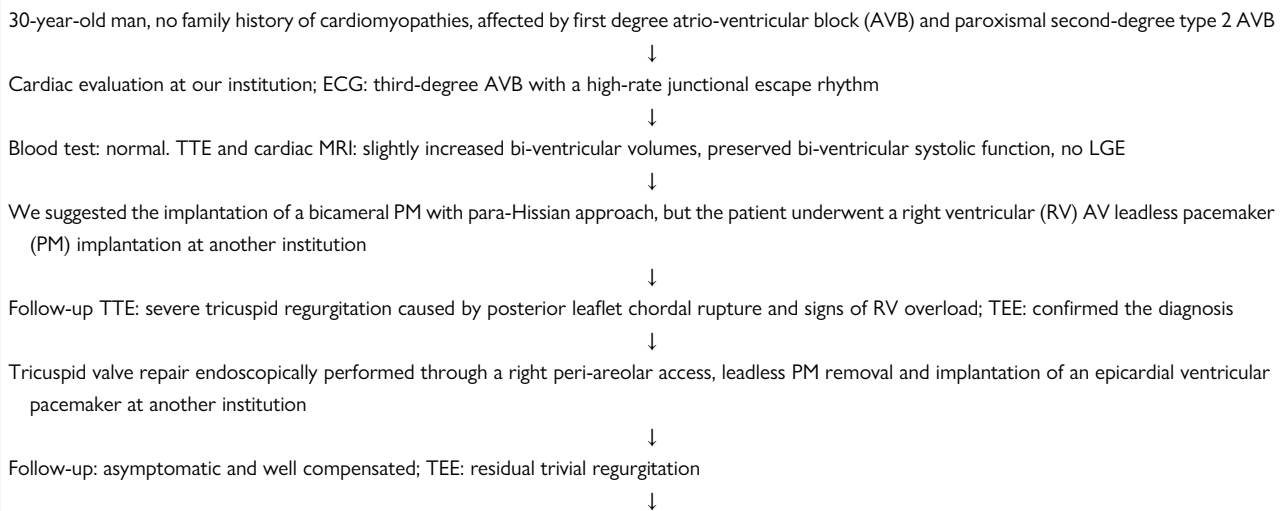


Figure 1

A 29-year-old underwent right ventricular Micra™ (Medtronic, Minneapolis, MN, USA) leadless pacemaker (PM) implantation at another institution for worsening but asymptomatic advanced atrio-ventricular block (AVB). The patient did not refer family history of cardiomyopathies, and he was diagnosed with second-degree Type 2 AVB at the age of 15; over the following years, he developed a third-degree AVB with a high-rate junctional escape rhythm. Transthoracic echocardiography (TTE) and a cardiac MRI (Figure 1A and B) performed before Micra™ implantation documented slightly increased bi-ventricular volumes, normal bi-ventricular systolic function, and absence of late gadolinium enhancement. At the beginning of the procedure, a temporary PM was positioned for safety reasons; the young man complained of chest discomfort afterwards; however, the chest X-ray resulted normal.

Thereafter, the TTE performed at our outpatient clinic 3 months later showed severe tricuspid regurgitation apparently caused by posterior leaflet chordal rupture and right ventricular overload, confirmed by transoesophageal echocardiography (TEE) (Figure 1C–G). The patient was referred for cardiac surgery evaluation and, through a right periareolar access, was performed an endoscopic optimal tricuspid valve repair; the Micra™ device was removed, and an epicardial PM was implanted (Figure 1H–I).

The Micra™ leadless PM consists of a tiny device (25.9–6.7 mm), delivered by a 23 Fr introducer in the right ventricle, which adheres by small nitinol anchors to the endocardium. To date, this is the first reported case of tricuspid flail after Micra™ implantation, which is usually considered an atraumatic

device for the tricuspid valve. It could be noticed that several serious complications might be avoided with TEE guidance which ensures safer procedures.

Lead author biography



Dr. Annachiara Pingitore is a young specialist in Cardiology and a PhD student. During the residency she gained professional experience in the diagnosis and treatment of cardiomyopathies and arrhythmogenic cardiac diseases. In the last few years, she acquired competences in advanced echocardiography, with particular application to the cardiac surgery and interventional cardiology.

Her PhD projects are focused on cardiovascular imaging in Sports Cardiology.

Consent: The patient gave his consent to proceed with the submission by signing the patient consent form.

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