

Cardiac resynchronisation therapy after percutaneous mitral annuloplasty

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Abstract

Percutaneous approaches to reduce mitral regurgitation in ischemic cardiomyopathy have stirred interest recently. Patients with ischemic cardiomyopathy and functional mitral regurgitation often meet criteria for cardiac resynchronisation therapy to improve left ventricular function as well as mitral regurgitation, and alleviate symptoms. This case shows that implantation

of a pacing lead in the coronary sinus to restore synchronous left and right ventricular contraction is feasible, despite the presence of a remodeling device in the coronary sinus.

Key words: Mitral regurgitation; Cardiac implantable electronic device; Percutaneous mitral regurgitation; Ischemic cardiomyopathy; Cardiac resynchronisation therapy

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Core tip: A review of cardiac resynchronisation therapy in a patient with ischemic cardiomyopathy and previous percutaneous mitral annuloplasty using a remodeling device in the coronary sinus.

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INTRODUCTION

This case reports a successful upgrade of an implantable cardioverter defibrillator (ICD) to a biventricular ICD, despite the presence of a remodeling device in the coronary sinus.

CASE REPORT

A 76-year-old man underwent mechanical aortic valve replacement 23 years ago and developed an ischemic cardiomyopathy [left ventricular (LV) internal diastolic dimension 69 mm, ejection fraction (EF) 30%] with coronary artery disease not amenable to revascularisation. Percutaneous mitral valve annulo-

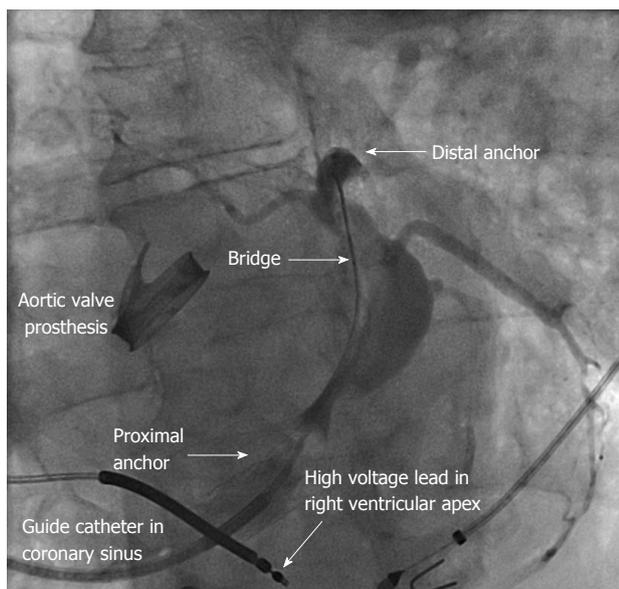


Figure 1 Balloon occlusion venogram in the coronary sinus. The proximal and distal anchors of the annuloplasty device are shown within the coronary sinus, which is filled with contrast to show target branches for the LV lead. LV: Left ventricular.

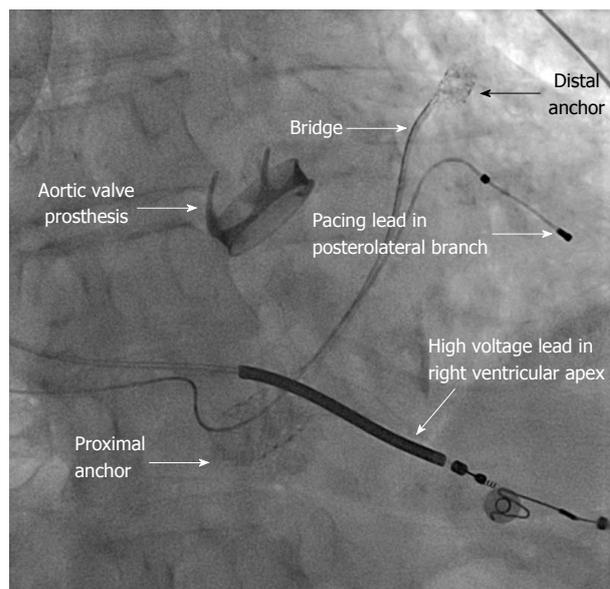


Figure 2 Pacing lead in posterolateral branch of the coronary sinus. The final position of the LV lead is shown. LV: Left ventricular.

plasty had been performed 7 years ago for severe functional mitral regurgitation, using a coronary sinus device (MONARC, Edwards Lifesciences, California). One year after mitral annuloplasty he was in persistent atrial fibrillation with a slow ventricular response rate, and as his LV function remained poor a single chamber ICD was implanted as primary prevention (Virtuoso generator with 6947 Sprint Quattro Secure lead, Medtronic, Minnesota). At generator replacement 6 years later he was in New York Heart Association (NYHA) class 3, with a paced left bundle branch block morphology, QRS duration 130 ms and his EF had deteriorated to 20%. Upgrade to a biventricular ICD was recommended in order to improve LV function, mitral regurgitation and symptoms.

After left subclavian vein access was achieved we advanced a guiding catheter over a wire and into the right atrium. We manipulated a polymer-tip wire past the proximal anchor of the annuloplasty device and into the body of the coronary sinus, and advanced the guide catheter over it. A balloon occlusion venogram was performed (Figure 1) and an 88 cm 5F Medtronic Attain Ability 4296 LV pacing lead was positioned in the posterolateral vein (Figure 2). Electrical parameters were good (threshold 1.0 V at 0.4 ms, R wave 11 mV, impedance 900 ohms) with no diaphragmatic pacing. The guiding catheter was slit and removed without dislodgement, and the lead was sutured to the pectoral muscle fascia. The existing generator was removed and a Medtronic Viva S cardiac resynchronization therapy device was connected to the leads, placed in the subcutaneous pocket, and the wound was closed. At 3 mo post-procedure the patient had symptomatically

improved to NYHA class 2, with a mild improvement in LV function and mitral regurgitation on echocardiography.

DISCUSSION

Implantation of a pacing lead into the coronary sinus is potentially challenging with an annuloplasty device already in the venous system. The device consists of a distal anchor in the great cardiac vein, a flexible shortening bridge, and a proximal anchor in the proximal coronary sinus^[1]. The anchors draw the proximal coronary sinus and distal great cardiac vein together, displacing the posterior annulus anteriorly, reducing mitral annulus diameter and septal-lateral distance, and thereby improving mitral insufficiency^[2-4]. As left ventricular systolic dysfunction and conduction abnormalities often coexist in patients with valvular heart disease, biventricular pacing is often indicated to attempt to restore synchronous contraction and improve ventricular function. This case shows that cardiac resynchronisation therapy is possible in the presence of a mitral annular remodeling device in the coronary sinus.

COMMENTS

Treatment

Left ventricular systolic dysfunction and conduction abnormalities often coexist in patients with valvular heart disease, biventricular pacing is often indicated to attempt to restore synchronous contraction and improve ventricular function.

Experiences and lessons

This case shows that cardiac resynchronisation therapy is possible in the presence of a mitral annular remodeling device in the coronary sinus.

Peer-review

The paper is well written.

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