

An unexpected outcome of successful radiofrequency ablation for persistent typical atrial flutter lasting 12 years

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Typical atrial flutter (AFL) is a type of macro-reentrant atrial tachycardia, with the cavotricuspid isthmus serving as the critical zone of slowed conduction.^{1,2} The success rate of pharmacotherapy in patients with AFL is limited, and class IC antiarrhythmic drugs are not recommended.³ An initial strategy of rate control is usually preferred, followed by a cardioversion procedure scheduled in advance.

A 77-year-old man after tricuspid valve replacement (Liotta bioprosthesis no. 29.9, Bio-Implant, Canada) and a surgery of ventricular septal defect in 1984, with severe bioprosthetic valve stenosis and long-standing persistent AFL was admitted for implantation of a pacemaker due to episodes of advanced atrioventricular block.

On admission, his medical records revealed over 10-year history of typical AFL with bifascicular block (FIGURE 1A and 1B). Echocardiography showed the enlargement of all heart chambers (left atrial area, 33 cm²; right atrial area, 40 cm²), enlarged coronary sinus, reduced left ventricular ejection fraction (35%–40%), moderate mitral regurgitation, and severe bioprosthetic valve stenosis (mean and maximal gradients, 9 mm Hg and 17 mm Hg, respectively).

Considering the presence of typical AFL, we decided to perform radiofrequency ablation (RFA). Once the involvement of the cavotricuspid isthmus in the circuit was confirmed, the RFA was performed and arrhythmia resolved. The patient's condition improved but severe sinus bradycardia was detected. Due to the presence of severe valve stenosis and bifascicular block,

a decision was made to implant dual-chamber rate-responsive pacemaker (DDDR) with a ventricular electrode inserted through the coronary sinus (FIGURE 1C and 1D) and long atrioventricular delay to avoid ventricular pacing (VP). Simultaneously, the patient was referred for percutaneous tricuspid valve-in-valve replacement.

After 1 month, the patient was readmitted to the hospital. Right heart catheterization and transesophageal echocardiography performed directly before the procedure revealed a marked reduction of the mean transtricuspid pressure gradient to a range of 3.5 to 5 mm Hg (FIGURE 1E and 1F). The VP percentage was close to 1%. Due to the absence of symptoms and a reduction in the prosthetic valve gradient, the implantation was not performed.

Radiofrequency ablation is the first-line treatment for symptomatic typical AFL and may be an alternative to electrical cardioversion in the management of ongoing arrhythmia.³ The success rate is close to 100%, with a recurrence rate of less than 10%.³ In our case, the treatment was effective, leading to a significant gradient reduction and sparing the patient a complex heart valve procedure. The mechanism underlying this outcome remains unclear. In AFL, right and left atrial pressures are increased, while right ventricular end-diastolic pressure is decreased. The restoration of sinus rhythm might have reversed these effects.⁴ Another mechanism could be the unmasking of stenosis (caused by undersized bioprosthesis) in response to an increased transvalvular flow rate during AFL, similarly to low-flow, low-gradient

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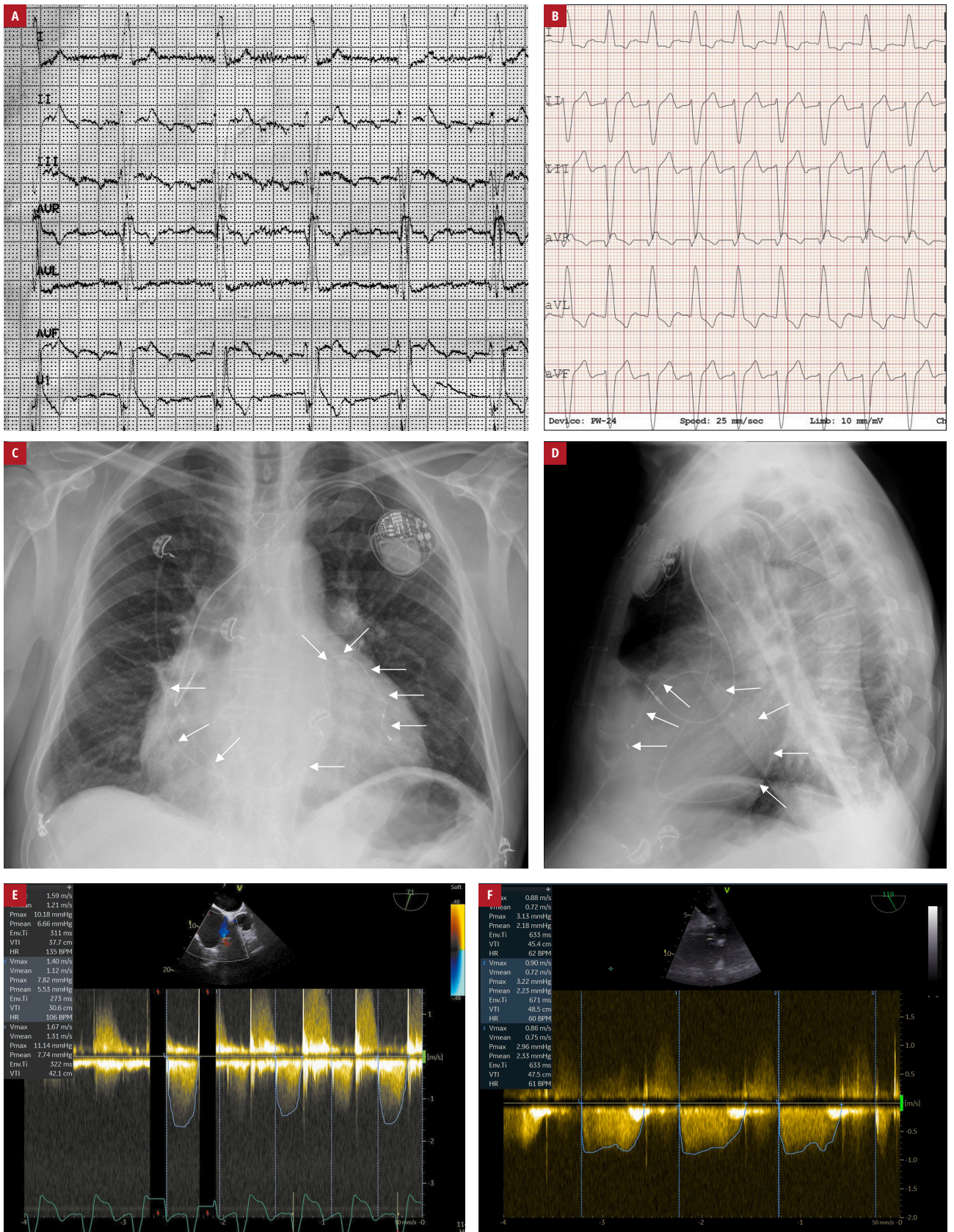


FIGURE 1 **A, B** – limb-lead electrocardiograms with typical atrial flutter showing the sawtooth pattern of the inverted flutter wave in leads II, III, and aVF and a positive wave in lead V₁ with bifascicular right bundle branch and left anterior fascicular block (RBBB+LAFB) recorded in 2007 (**A**) and immediately before the ablation in 2018 (**B**). **C, D** – chest X-ray scan after the pacemaker implantation in the posterior–anterior (**C**) and lateral (**D**) projections showing the position of the ventricular electrode inserted through the coronary sinus to the great cardiac vein. Due to the presence of RBBB+LAFB, the electrode was inserted close to the intraventricular septum instead of left ventricular lead position (as in standard cardiac resynchronization) (white arrows); **E, F** – continuous-wave Doppler recording showing the values of the transvalvular gradient through the tricuspid valve prosthesis before (**E**) and after (**F**) the ablation procedure. Abbreviations: LAO, left anterior oblique; RAO, right anterior oblique

aortic stenosis during stress test.⁵ The influence of left ventricular pacing can be excluded because the VP percentage was low. Our case shows that modern invasive cardiac treatment may be a promising and effective option even in patients with typical AFL of an extremely long duration.

ARTICLE INFORMATION

CONFLICT OF INTEREST None declared.

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