An 84-year-old man with a history of hypertension was referred for echocardiography because of shortness of breath. A transthoracic echocardiogram showed normal left ventricular ejection fraction, mild concentric left ventricular hypertrophy and mild mitral, aortic and tricuspid regurgitation. Colour Doppler, colour M-mode and continuous-wave Doppler recordings of the transmitral flow also revealed retrograde flows from the left ventricle into the left atrium (Fig. 1A–C; Video 1) and from the right ventricle into the right atrium (Fig. 1D–E; Video 2) during diastole, which define diastolic mitral and tricuspid regurgitation. Transmitral pulsed-wave Doppler (Fig. 1F) also disclosed complete dissociation of mitral "E" and "A" waves, and a 12-lead electrocardiogram confirmed the diagnosis of third-degree atrioventricular block. A single-chamber permanent pacemaker was subsequently implanted without complications.

Atrioventricular conduction abnormalities are a well-known cause of diastolic atrioventricular regurgitation. Other potential aetiologies include severe acute aortic regurgitation and restrictive ventricular physiology. In patients with atrioventricular block of any degree, an appropriately timed ventricular systole may not occur at the end of atrial systole; in these cases, the increase in left ventricular diastolic pressure following atrial systoles — particularly in patients with a non-compliant left ventricle — may result in transmitial pressure gradient inversion during atrial relaxation, and mid or late diastolic mitral regurgitation may develop. The same pathophysiological mechanism accounts for the...
development of diastolic tricuspid regurgitation, which frequently accompanies diastolic mitral regurgitation.

Conflicts of interest

None.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.acvd.2009.06.007.