LETTERS TO THE EDITOR

Scope

Heart welcomes letters commenting on papers published in the journal in the previous six months. Topics not related to papers published earlier in the journal may be introduced as a letter: letters reporting original data may be sent for peer review.

Presentation

Letters should be:

- not more than 600 words and six references in length
- typed in double spacing (fax copies and paper copy only)
- signed by all authors.

They may contain short tables or a small figure. Please send a copy of your letter on disk. Full instructions to authors appear in the July 1996 issue of Heart (page 93).

Mitral valve replacement for pacing-induced severe mitral regurgitation after radiofrequency ablation of the atrioventricular junction

Sir,—Severe mitral regurgitation is an uncommon event after radiofrequency ablation of the atrioventricular junction. We report two patients in whom pacing-induced mitral regurgitation required mitral valve replacement after ablation of the atrioventricular junction.

Case 1—A 68 year old man had drug-refractory chronic atrial fibrillation. On admission, he was in NYHA (New York Heart Association) functional class II and had a grade 2/6 murmur of mitral regurgitation. Transthoracic and Doppler echocardiography showed moderate mitral regurgitation and rheumatic lesions of the mitral valve. Radiofrequency catheter ablation of the atrioventricular junction was performed. A transvenous right apical ventricular pacemaker was inserted with pacing in the VVI mode. The next day acute pulmonary oedema with a grade 4/6 systolic murmur developed. Doppler echocardiography showed severe mitral regurgitation. Mitral valve replacement was performed. Six months after surgery he was symptom free.

Case 2—A 66 year old woman with recurrent atrial fibrillation was admitted for ablation of the atrioventricular junction. On admission she was in NYHA functional class II. Transthoracic and transoesophageal echocardiography showed moderate mitral regurgitation with slightly restricted motion of the posterior leaflet. Ablation of the atrioventricular junction was performed. A right apical ventricular pacemaker was inserted with pacing in the DDD mode and preservation of atrioventricular synchrony. Eight days later she was admitted to hospital with severe acute pulmonary oedema, despite sinus rhythm and permanent ventricular capture. Transthoracic echocardiography showed severe mitral regurgitation. Mitral valve replacement was performed. The patient recovered quickly.

Radiofrequency catheter ablation of the atrioventricular junction is an effective treatment for drug-refractory supraventricular tachycardia, but results in permanent ventricular pacing. Right apical ventricular pacing can induce significant mitral regurgitation.1 Ventriculoatrial conduction may be responsible for severe mitral regurgitation during ventricular pacing.2 However, DDD pacing-induced severe mitral regurgitation with preservation of atrioventricular synchrony,3 and ventricular pacing-induced severe mitral regurgitation in the absence of retrograde conduction have been rarely reported.4 In the two cases we report there was pre-existing mitral regurgitation with valvular abnormalities, as there were in the case report of Mark and Chatham.5 Underestimation of mitral regurgitation severity ablation of the atrioventricular junction seems unlikely because echocardiographic studies were performed by the same experienced operator, and reviewed by a second operator. Moreover, both patients had marked clinical deterioration after ablation of the atrioventricular junction and pacemaker implantation.

There are several explanations for pacing-induced severe mitral regurgitation in these two patients. First, VVI or DDD pacing induce a significant increase in end diastolic volume.6 The increase in preload and the associated change in left ventricular chamber shape may enhance pre-existing mitral regurgitation.7 Second, right apical ventricular pacing reverses the activation sequence of the left ventricle, and delays septal motion. Subsequent alteration in papillary muscle function could increase pre-existing mitral regurgitation, especially in the presence of leaflet motion abnormalities. Third, during physiological activation, the mitral annulus moves forward in systole and decreases in area by 25%.8 Borgenhagen et al showed that this phenomenon was associated with a 59% reduction in the mitral regurgitant orifice size.9 It is likely that the inversion of the ventricular activation sequence is associated with a delayed mitral annulus size and mitral regurgitant orifice size and that it is this that enhances mitral regurgitation.

In patients with moderate mitral regurgitation, Doppler echocardiography or haemodynamic assessment of mitral regurgitation during transient right apical ventricular pacing should be performed before ablation of the atrioventricular junction. If pacing induces severe mitral regurgitation, alternative treatments such as modification of the atrioventricular conduction by slow pathway ablation or right ventricular septal pacing should be considered.

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NOTICES

The 2nd International Meeting on Interventional Cardiology will be held in Jerusalem, Israel from June 30–July 3 1997. There will also be a satellite symposium on stenting and adjunctive pharmaceutical therapy in Eilat, Israel on July 4–5 1997. For further information please contact the Secretariat, PO Box 50006, Tel Aviv 61500, Israel (tel: 972 3 514 0000, fax: 972 3 517 5674 or 972 3 514 0077).

The 2nd International Symposium on Perioperative Cardiac Care will be held at The Dan Panorama, Tel Aviv, Israel from September 24–26 1997. For further information please contact the Secretariat, 2nd International Symposium on Perioperative Cardiac Care, PO Box 50006, Tel Aviv 61500, Israel (tel: 972 3 514 0000, fax: 972 3 517 5674 or 972 3 514 0077).