

Effect of Intravenous Adenosine on Simultaneous Dissociated Rhythms in Contralateral Superior Pulmonary Veins

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A 61-year-old man with a 5-year history of paroxysmal atrial fibrillation (AF), refractory to amiodarone, sotalol, and flecainide, was referred for interventional management of his arrhythmia. Transthoracic and transoesophageal echocardiography were unremarkable. Transseptal puncture was performed and pulmonary venography demonstrated 4 pulmonary veins (PVs) suitable for treatment using the 28 mm cryoballoon (Artic Front, Cryocath, Medtronic, USA).

The left followed by the right PVs were isolated with 2 applications per vein using the balloon alone and con-

firmed with a circumferential mapping catheter. Pulmonary vein potentials were absent from both inferior PVs following cryoablation; however, regular dissociated rhythms of differing cycle lengths were observed simultaneously in both superior veins.

Adenosine 12 mg was given as an intravenous bolus with circumferential mapping catheters in both superior PVs (Fig. 1). The effect of adenosine differed between veins. In the RSPV, immediately prior to complete AV block, the dissociated PV potential is first delayed relative to the previously regular dissociated rhythm recorded in that vein. The PV potentials then become re-associated with the surface P wave, but clearly not preceding it, confirming passive activation of this vein from the atrium. Conduction out of the vein was not tested during maximal adenosine effect. Once AV block resolves, there is temporary silence of the RSPV followed by resumption of a dissociated rhythm slower than that seen before administration of adenosine. In the LSPV, adenosine markedly slows the dissociated rhythm and there is no recovery of LA to PV

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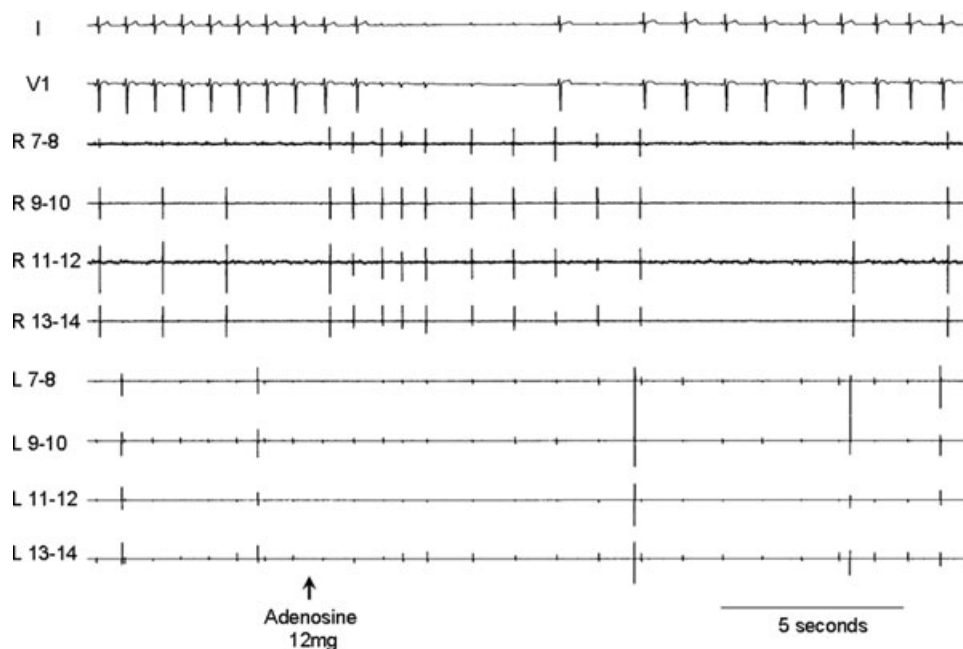


Figure 1. Sinus rhythm with dissociated rhythms recorded in the right (R) and left (L) superior PVs using a circumferential mapping catheter. Representative bipoles of the mapping catheter are displayed.

conduction during the period of AV block. Once complete AV block has resolved, a more rapid dissociated rhythm resumes.

Adenosine shortens the atrial action potential duration and, therefore, the refractory period, and has been proposed as a useful tool to reveal potential sites of LA–PV conduction

recurrence and thereby improve the efficacy of PV isolation procedures for AF. Although in this patient we elected not to cryoablate further the RSPV, the effects of adenosine on the superior PVs would suggest that any future recurrence maybe related to conduction recovery of the RSPV, although this hypothesis remains to be proven.