A 60-year-old man with obesity and severe left ventricular dysfunction and left atrial dilatation underwent catheter ablation of symptomatic, drug-refractory, persistent atrial fibrillation. After pulmonary vein isolation and electrogram-based ablation, atrial fibrillation was cardioverted successfully. Mitral isthmus ablation was undertaken during distal coronary sinus (CS) 1 to 2 pacing. CS blood flow was occluded by inflating a 1-cm spherical balloon distally. During ongoing radiofrequency application using an irrigated ablation catheter (average power, 34 W; temperature, 39°C) on the endocardial mitral isthmus line, conduction delay between the bipoles CS 1 to 2 (pacing site) and CS 3 to 4 jumped suddenly from 22 to 168 ms, indicating local block within the CS (epicardial) (Figure). The CS activation pattern immediately changed from distal to proximal at baseline to proximal to distal after the block (Figure). The conduction along the corresponding endocardial (left atrial) side (arrows) was not affected (not blocked). The latter was assessed from the far-field left atrial potentials recorded on the CS bipoles (Figure). Notably, only 165 s of endocardial radiofrequency application was made before the moment of epicardial block.

Mitral isthmus ablation is challenging. CS blood flow acts as a “heat sink” precluding transmural lesion formation during endocardial ablation. Consequently, epicardial radiofrequency application from inside the CS frequently is necessary. Balloon occlusion of CS facilitates formation of transmural lesion from the endocardium and curtails the need for epicardial ablation.1,2 We recorded an epicardial-only block within 3 minutes of endocardial mitral isthmus ablation. Such rapid attainment of epicardial block can be explained by the fact that the epicardial muscle sleeve enveloping the distal CS is thin, making it susceptible to ablation faster than the relatively thicker musculature of the contiguous endocardial left atrium,3 especially when the elimination of epicardial heat sink facilitates formation of transmural lesion from the endocardium. Mitral isthmus was transmurally blocked after 16 minutes of endocardial radiofrequency application. Epicardial ablation was not required. There were no complications from 25 minutes of CS occlusion.

Disclosures

None.

References


Keywords: mitral valve • coronary sinus • balloon occlusion • heart block

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Figure. Fluoroscopic images show occlusive venogram of the CS and ablation of mitral isthmus from its endocardial side with balloon inflated in the CS. During ongoing endocardial mitral isthmus radiofrequency application, the intracardiac electrograms record the acute moment of epicardial-only block during CS 1 to 2 pacing. This is marked by instantaneous increase in the delay on bipole CS 3 to 4 from 22 to 168 ms. There is no change in the delay to the far-field endocardial recordings (84 ms on CS 3 to 4 and 100 ms on CS 5 to 6) before and after the moment of block. Notably, the $P$ wave morphology also changed at the moment of epicardial block. The broken arrows represent the activation patterns of epicardial CS before and after the epicardial-only block. CS indicates coronary sinus.
Epicardial-Only Block During Endocardial Mitral Isthmus Ablation Facilitated by Coronary Sinus Occlusion
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In the article, “Epicardial-only block during endocardial mitral isthmus ablation facilitated by coronary sinus occlusion,” by Shah et al, which appeared in the August issue of the journal (Circ Arrhythm Electrophysiol. 2011;4:e42–e43), the figure has not displayed properly.

The figure should be:

Figure. Fluoroscopic images show occlusive venogram of the CS and ablation of mitral isthmus from its endocardial side with balloon inflated in the CS. During ongoing endocardial mitral isthmus radiofrequency application, the intracardiac electrograms record the acute moment of epicardial-only block during CS 1 to 2 pacing. This is marked by instantaneous increase in the delay on bipole CS 3 to 4 from 22 to 168 ms. There is no change in the delay to the far-field endocardial recordings (84 ms on CS 3 to 4 and 100 ms on CS 5 to 6) before and after the moment of block. Notably, the P wave morphology also changed at the moment of epicardial block. The broken arrows represent the activation patterns of epicardial CS before and after the epicardial-only block. CS indicates coronary sinus.

The online version of this article has been corrected.

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