IMAGES IN CARDIOLOGY

Cavotricuspid Isthmus Ablation Using a Novel High-Density Automated Electroanatomical Contact Mapping System

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Abstract

A case of atrial flutter ablation is presented with use of a novel high-density automated electroanatomic contact mapping system that was employed for guidance of the procedure. ***Rhythmos 2021; 16(2):39-40.***

Key Words: atrial flutter; catheter ablation; electroanatomical mapping; cavotricuspid isthmus; fluoroscopy

Abbreviations: AFlu = atrial flutter; CTI = cavotricuspid isthmus; EAM = electroanatomical mapping

A 74-year-old gentleman with history of symptomatic recurrent atrial flutter (AFlu) was referred for catheter ablation of his arrhythmia. He suffered from episodes of AFlu (**Fig. 1**) for the preceding two years using the "pill-in-the-pocket" approach with IC antiarrhythmic agents, however he often had to visit the emergency room for cardioversion due to non-responding arrhythmia. His past medical history was significant for hypertension managed with a sartan, hypercholesterolemia managed with a statin, familial tremor treated with propranolol, and a recovered stroke 23 years earlier. He underwent a computed tomography coronary angiography 2 months earlier which showed non-significant coronary artery disease and a myocardial bridge. He was receiving anticoagulation therapy with use of rivaroxaban 20 mg qd, which he stopped one day prior to ablation.

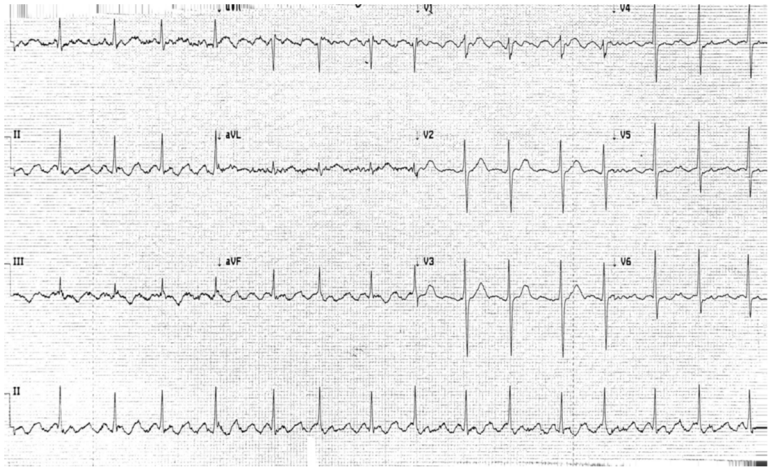

Figure 1

During the ablation procedure, electroanatomical mapping via the Rhythmia™ mapping system (Boston Scientific, MA, USA), a novel, high-density automated electroanatomic contact mapping system, was employed for guidance. The IntellaMap Orion™ high-resolution mapping (8.5F) catheter with a 64-electrode basket design and bidirectional steerability was used for mapping (**Fig. 2**, panel A, arrow). The quadripolar IntellaNav MiFi™ XP (8F) catheter was used for ablation. A set of linear lesions was designed (**Fig. 2**, panel B, grey dots) and delivered (**Fig. 3**, panel C, red dots) at the cavotricuspid isthmus (CTI) and bidirectional block was achieved, as tested with pacing at the coronary sinus os and at the lateral right atrium. The procedure lasted for ~1 hour with a 9-minute fluoroscopy duration; it was free of complications and the post-procedural course was uneventful. At the 9-month follow up, the patient remains free of arrhythmia recurrence.

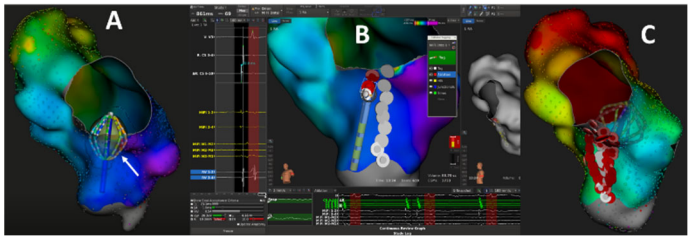

Figure 2

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Producing bidirectional block via linear radiofrequency (RF) ablation of the CTI is the standard ablation technique that has been employed for typical CTI-dependent AFlu.[1] Manolis Rhythmos This can be achieved with conventional means or use of electroanatomical mapping (EAM).[2] Manolis CIR Standard EAM systems have some limitations regarding spatial resolution and speed of map acquisition; the new high-density automated EAM employed in our case, the Rhythmia™ system, potentially addresses these concerns by using a mini-basket catheter with 64 micro electrodes to collect more data points and record quality signals faster than conventional EAM systems.[3, 4] Bun, Meyer 2019

The radiation exposure can be significantly reduced with use of EAM; it was only a 9-minute exposure in our procedure compared to approximate 30-minute duration of fluoroscopy exposure reported with use of conventional ablation procedures.[5] Willems Even zero-fluoroscopy procedures have been reported with use of EAM during CTI catheter ablation.[6] Macias

Nevertheless, high-density electroanatomical mapping seems to be more important in patients with non-CTI dependent AFlu or patients who have undergone prior procedure(s) with extensive catheter ablation for the treatment of AF or macro-reentrant atrial tachycardia, whereby it can facilitate the detection of a critical isthmus and the residual slow conduction area and guide successful ablation.[4]

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