EP IMAGE

Bipolar Radiofrequency Ablation of Typical Atrial Flutter

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Radiofrequency catheter ablation (RFCA) of typical atrial flutter (AFL) is an effective and widely used method of treatment. Confirmation of conduction block in the cavotricuspid isthmus (CTI) is the end point of the procedure. Acute success rate is high, but in some cases may be difficult or not possible to achieve with conventional unipolar energy sources. We describe a case of successful CTI redo procedure using bipolar ablation in a 37-year-old male who in 2010 underwent unsuccessful RFCA for drug-resistant typical AFL. The procedure lasted 120 minutes. A complete lesion creation was not possible using an 8-mm ablation catheter, even with high power settings (60 Watts). An additional problem was impaired steerability of ablation catheter because of the presence of overdeveloped Chiari's network (CN). The arrhythmia continued to be resistant to class IC and III antiarrhythmic drugs. We decided to perform a redo procedure with bipolar radiofrequency (RF) current. Imaging showed enlarged CN between the inferior vena cava and right atrium in close proximity to CTI (Fig. 1). Regular 8-mm ablation catheter (Triguy, APT Medical, Shenzen, China) was placed in the CTI, while a 4-mm-irrigated catheter (Alcath flux, Biotronik, Berlin, Germany) was placed in the inferior vena cava, right under CN (Fig. 2). A 4-mm catheter was connected to the modified purpose-made switchbox in order to connect the tip electrode as an indifferent catheter (instead of dispersive patch) to the RF generator (EP Shuttle, Stockert, Freiburg, Germany). After deep sedation, three prolonged (70-, 50-, and 60-second long, respectively) RF applications at generator power settings of 50–55 Watts, limiting ablation catheter tip temperature to 50–55°C, and with indifferent catheter irrigation of 30 mL/min were delivered, resulting in permanent CTI block depicted by double-atrial potentials, separated by 111 milliseconds. Bidirectional block was further confirmed by pacing maneuvers and measurements from the proximal coronary sinus and tricuspid annulus. In conclusion, bipolar RFCA with a set of ablation and indifferent catheter can be used for CTI-dependent AFL resistant to standard unipolar RF ablation. The safety and efficacy of this technique need to be confirmed in future studies.

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Disclosures: None.

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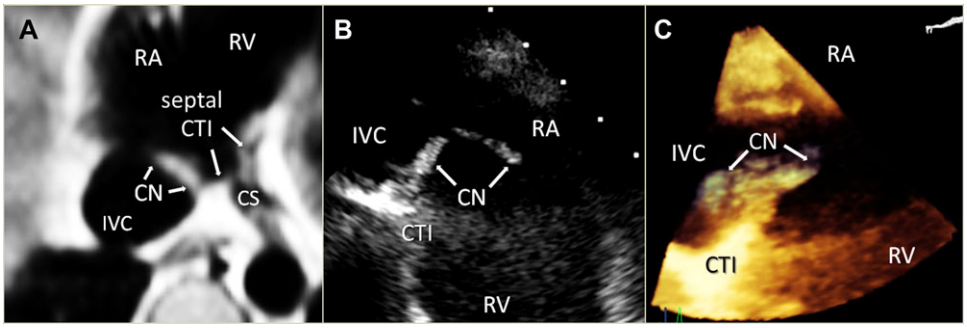

Figure 1. *Periprocedural visualization of the area of radiofrequency bipolar ablation. Magnetic resonance (A), 2-dimensional (B), and 3-dimensional (C) transesophageal echocardiography show the presence of enlarged Chiari's network (CN) originating from cavotricuspid isthmus (CTI). CS = coronary sinvvus; IVC = inferior vena cava; RA = right atrium; RV = right ventricle. For a high quality, full color version of this figure, please see Journal of Cardiovascular Electrophysiology's website: www.wileyonlinelibrary.com/journal/jce*

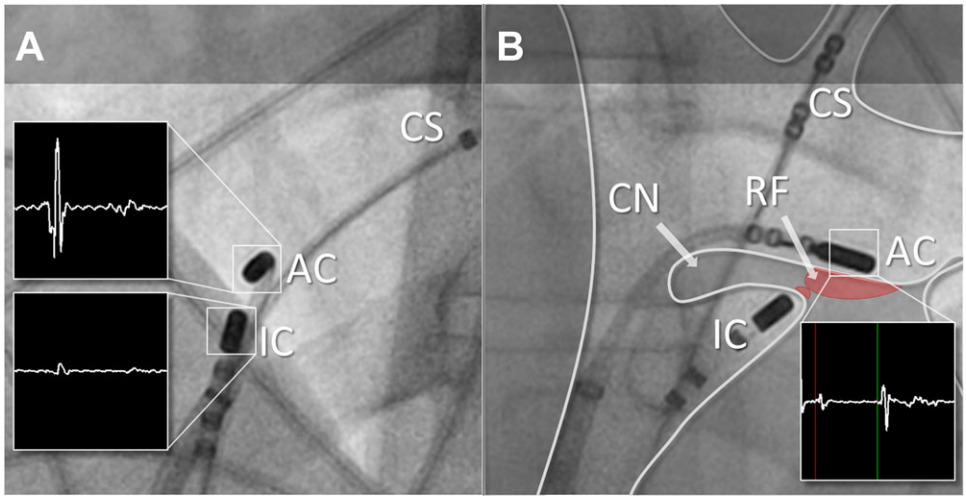

Figure 2. *A: Fluoroscopic images of the right atrium in the left lateral oblique projection (30°) showing indifferent catheter (IC) and ablation catheter (AC) at the radiofrequency (RF) site with signals recorded during sinus rhythm preceding bipolar RF delivery. B: Right latertal oblique projection (30°) with schematic view of relevant structures. The AC and IC surround Chiari's network (CN) and fit closely to cavotricuspid isthmus (CTI) region. Double atrial signals, confirming block in the CTI, separated by 111 milliseconds during pacing from coronary sinus (CS) and recorded from the ablation line, are shown. For a high quality, full color version of this figure, please see Journal of Cardiovascular Electrophysiology's website: www.wileyonlinelibrary.com/journal/jce*