

EP CASE REPORT

The bipolar ablation of refractory typical atrial flutter with CARTO 3 Confidense system

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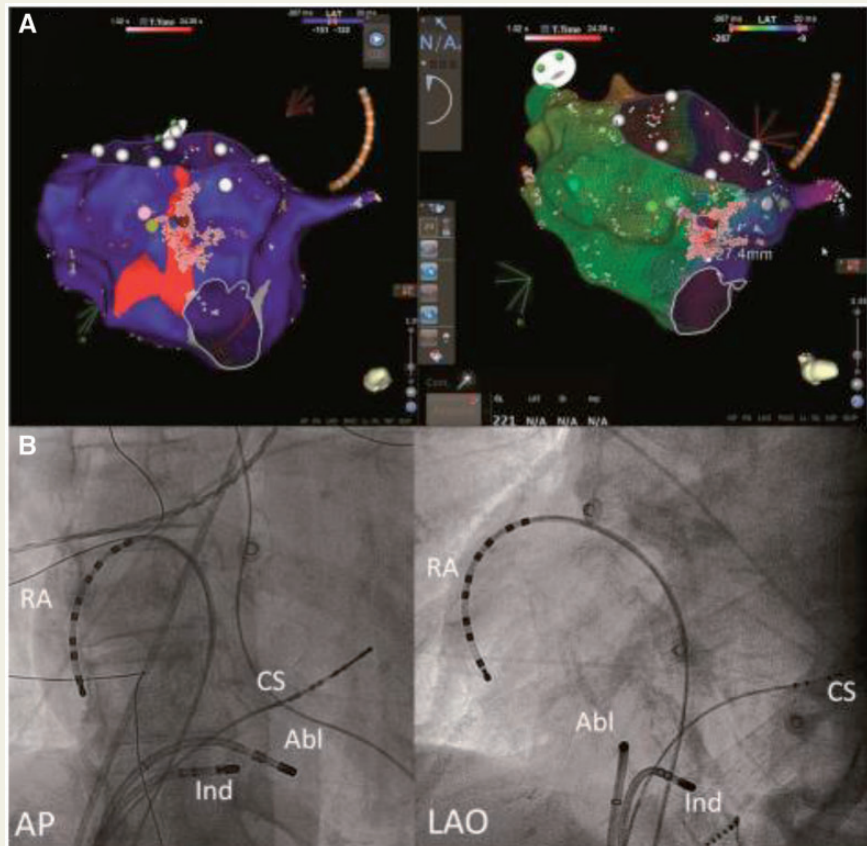
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The typical atrial flutter is a reentrant arrhythmia with critical isthmus between tricuspid valve and inferior vena cava. The main target of ablation is to create a bidirectional block in the cavotricuspid isthmus. There are several anatomical variants which can create the obstacle to achieve successful ablation, namely the long isthmus, its shape (straight, convex, or pouch like), prominent Eustachian ridge or overdeveloped Chiari's network.^{1,2} The bipolar ablation can result in higher transmuralty than unipolar ablation, however there are only a few published cases and there are no dedicated systems.³

We report on the 59 year old female with incessant atrial flutter with rapid ventricular response who developed cardiomyopathy. She previously underwent three unsuccessful RF ablations in two different EP centers. Long applications up to 50 W with the use of 8 mm and irrigated tip electrodes were only transiently successful. At this stage the patient was qualified for RF bipolar ablation.

As it is off-labelled use of standard

RF generator and ablation electrodes the procedure obtained an individual permission from Local Ethics Committee and patient provided a written informed consent before procedure. Ablation was performed under general anaesthesia as previous ablations were painful. The 10 pole electrodes were positioned in the coronary sinus and the lateral part of right atrium. The high density map has been created using THERMOCOOL[®] SMARTTOUCH[™] Catheter connected to CARTO 3 system with Confidense module (Biosense-Webster, Inc.). The entrainment pacing and propagation map confirmed cavotricuspid isthmus involvement in the flutter. The isthmus was meticulously visualized and measured. The slow conduction through the middle part was identified (Figure 1A). Initially, standard 180 s linear application (40 W) was delivered without success. Thereafter the THERMOCOOL[®] SMARTTOUCH[™] Catheter was positioned on the middle part of the isthmus. The 7F 4 mm Celsius electrode (Biosense-Webster, Inc.) was introduced to the right atrium and connected to the LabSystem Pro (Boston Scientific) and Stockert generator in order to record the most distal atrial potential of the isthmus and impedance. This was to avoid going too deeply into IVC and performing ablation in the vein. After checking the position of electrodes on fluoroscopy in two projections, Celsius electrode was connected with indifferent electrode receptacle of the RF generator using a custom-made connector (Figure 1B). 40 W application was started resulting in flutter interruption in 10 s with bidirectional block. The application was continued for 90 s slowly dragging the active electrode to reach the other side of the isthmus precisely monitoring the impedance which decreased from 147 to 141 Ω . After 30 min after ablation there was bidirectional block with line of double potentials. The patient was discharged and followed for 3 months without recurrence of atrial flutter.



Conclusion: The irrigated RF bipolar ablation of typical atrial flutter can be feasible using standard ablation electrodes. The electroanatomic system can also be used to identify the target. This technique is still experimental and definitely requires more investigations before being advocated for more general use.

References

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3. Nguyen DT, Tzou WS, Brunnuquell M, Zipse M, Schuller JL, Zheng L et al. Clinical and biophysical evaluation of variable bipolar configurations during radiofrequency ablation for treatment of ventricular arrhythmias. *Heart Rhythm* 2016;**13**:2161–71.