EP CASE REPORT

Ultra-high density electroanatomic mapping of left atrial local macro-reentry occurring twenty-three years after orthotopic heart transplantation

Pierre Ollitrault[1,2]*, Arnaud Pellissier[1], Mathieu Chequel[1,2], Pierre Breguiboul[3], Laure Champ-Rigot[1], and Paul Milliez[1,2]

[1]Department of Cardiology, Caen Regional University Hospital, Avenue de la Côte de Nacre, 14000 Caen, Normandy, France; [2]University of Caen Normandy, F-14000 Caen, France; and [3]Boston Scientific, F-78960 Voisins-le-Bretonneux, France

* Corresponding author. Tel: +33 (0)2 31 06 51 18; fax: +33 (0)2 31 06 44 18. *E-mail address*: ollitrault-p@chu-caen.fr

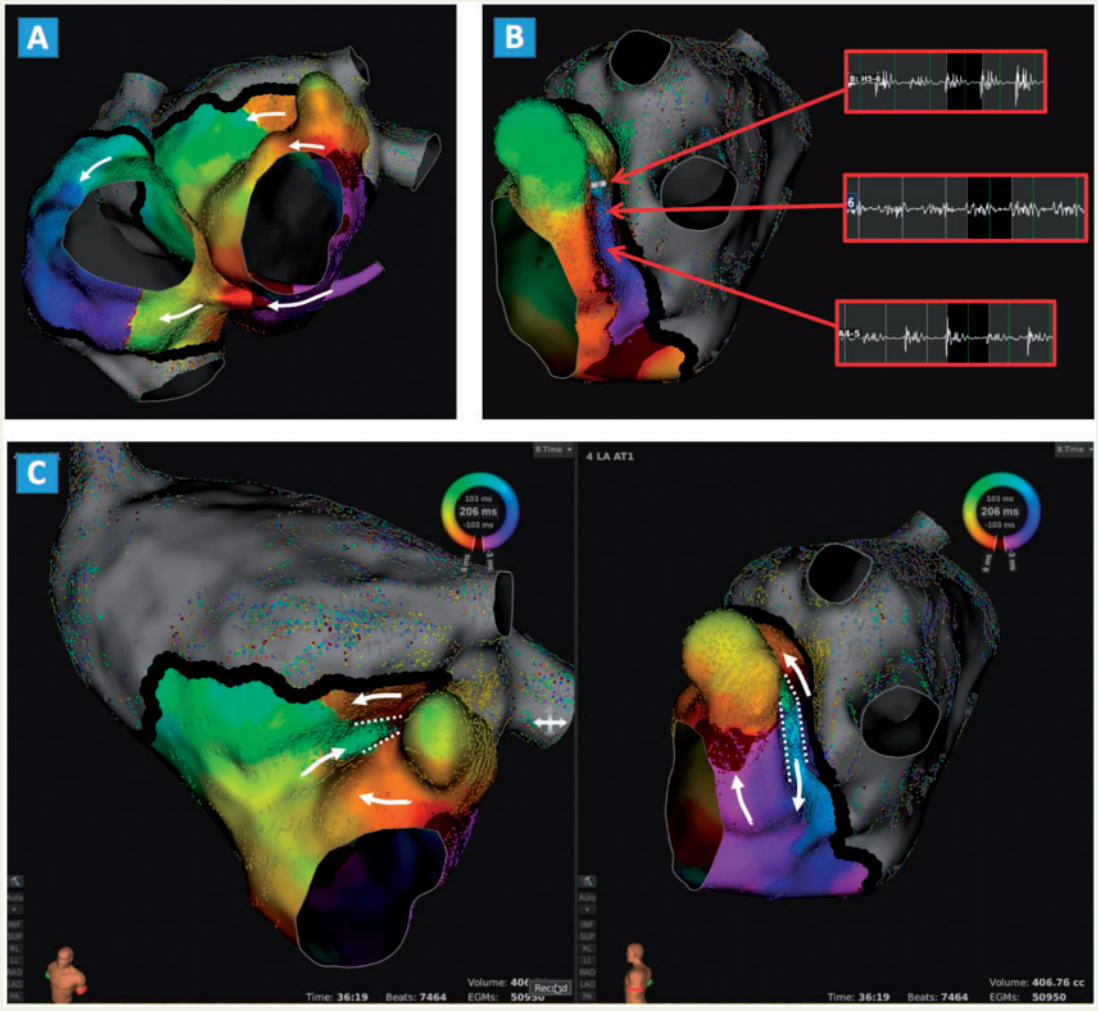

Figure 1 (*A*) Activation map of both atria in left anterior oblique view, confirming cavotricuspid isthmus block; (*B*) activation map of left atrial lateral wall in lateral view (*C*) activation map of left atrial lateral wall in superior (left panel) and lateral (right panel) views.

A 48-year-old man with orthotopic cardiac transplantation (at age 25) and cavotricuspid isthmus ablation (at age 46), was referred for catheter ablation of a persistent and symptomatic atrial tachycardia. Preprocedural computed tomography was performed to appreciate atrial anatomy, and rule-out intra-atrial thrombus. Catheter ablation was performed under general anaesthesia with endotracheal intubation and Rhythmia HDX™ system (Boston Scientific, USA) for mapping. Firstly, we realized activation map of the right atrium using Intellamap Orion™ basket catheter (Boston Scientific, USA). This map was completed within 27 min with 35 000 electrograms, confirming cavotricuspid isthmus block with a 210 ms cycle length tachycardia. Right atrium was bystander with an incomplete cycle mapping and an emerging point located to the ostium of coronary sinus (Supplementary material online, *Video S1*). Activation map of the left atrium (LA) was achieved through a trans-septal approach, lasting 35 min and collected 50 000 electrograms for a total volume of 450 mL (*Figure 1A*, Supplementary material online, *Video S2*). Voltage map showed an electrically silent remnant atrium, including pulmonary veins, and higly fractioned electrograms along the LA ridge (*Figure 1B*). Activation analysis revealed LA local macro-reentry from the donor heart with a figure-of-8 pattern: downward activation through LA ridge (critical isthmus), and upward activation through both LA lateral wall anteriorly and along the atrio-atrial anastomosis posteriorly (*Figure 1C*, Supplementary material online, *Video S3*). Ablation was performed at the exit site of the critical isthmus, at the inferior part of LA ridge, with a 4 mm irrigated-tip catheter to deliver 30 W and rapidly terminated tachycardia. Intra-atrial re-entrant tachycardia was no longer inducible at baseline and after isoproterenol infusion. Procedure lasted 150 min with 13 min of fluoroscopy. The patient had no recurrence after 6 months.

Supraventricular arrhythmias occur in 2–7% of patients late after orthotopic heart transplantation, and catheter ablation is the cornerstone for restauration of sinus rhythm.[1] Cavotricuspid isthmus-dependent atrial flutter and right focal atrial tachycardia (mostly emerging from atrio-atrial anastomosis) represent the most frequent types. Left atrial local macro-reentry is an exceptional finding and has not been reported in the literature to our knowledge.[2,3] In this context of severe atrial remodelling, dilated atria and surgical scars, ultra-high density mapping is a useful tool to determine activation pattern and critical isthmus. In this case, we highlighted the high diagnostic accuracy of using Intellamap Orion™ basket catheter and Rhythmia HDX™ platform, leading to the targeted catheter ablation of a complex atrial arrhythmia.

Supplementary material is available at *Europace* online.

Conflict of interest: P.B. is an employee of Boston Scientific.

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