Transconduit puncture without per-procedural echocardiography in nonfenestrated extracardiac Fontan using a simplified approach guided by electroanatomic mapping

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A 36-year-old man with double-inlet left ventricle, previous nonfenestrated extracardiac Fontan surgery (Gore-Tex conduit), and epicardial dual-chamber pacemaker was referred for catheter ablation of symptomatic atrial tachycardia. Because the arrhythmia was paroxysmal, general anesthesia, which may limit inducibility, was avoided. Transesophageal echocardiography was also avoided because of the patient’s history of chest radiotherapy. Computed tomography (CT) with 3-dimensional (3D) reconstruction showed the position of the extracardiac conduit (EC) along the lateral wall of the right atrium (Supplemental Figure 1, cinematic rendering). First, the EC volume, which was acquired by a Pentaray catheter (Biosense Webster, Diamond Bar, CA), was merged with the 3D CT reconstruction of the heart (CARTO 3, Biosense Webster). Then, the ablation catheter (4-mm SmartTouch SF, Biosense Webster) was positioned at the optimal site for transconduit puncture (Figure 1A). A Brockenbrough needle (BRK-XS, St. Jude Medical, Minnetonka, MN) was positioned at the exact location of the ablation catheter tip under fluoroscopic guidance (Figure 1B and Supplemental Video 1). Correct positioning was confirmed by biplane fluoroscopy. The transconduit puncture was successfully achieved with contrast medium injection and pressure guidance without the use of transesophageal or intracardiac echocardiography (Supplemental Figure 2). Activation mapping and local electrograms were consistent with an automatic focus on the right atrial roof, print & web 4C FPO
and ablation at this site was successful. The patient was discharged home without complication.

Despite limited experience, catheter ablation is efficient for treating atrial arrhythmias in patients with extracardiac Fontan palliation. The transconduit approach, which provides the most stable access, is preferred. Here, the transconduit puncture was performed without the use of transesophageal or intracardiac echocardiography by merging the CT volume of the heart with the EC volume acquired by the CARTO system. This simplified method does not require general anesthesia and provides a minimally invasive option for definitive treatment of highly symptomatic and often life-threatening atrial arrhythmias in patients with extracardiac Fontan palliation.

Appendix

Supplementary data

Supplementary data associated with this article can be found in the online version at https://doi.org/10.1016/j.hrthm.2017.11.023.

References