



A novel approach for transtunnel puncture in a patient with atrial tachyarrhythmias and Fontan circulation

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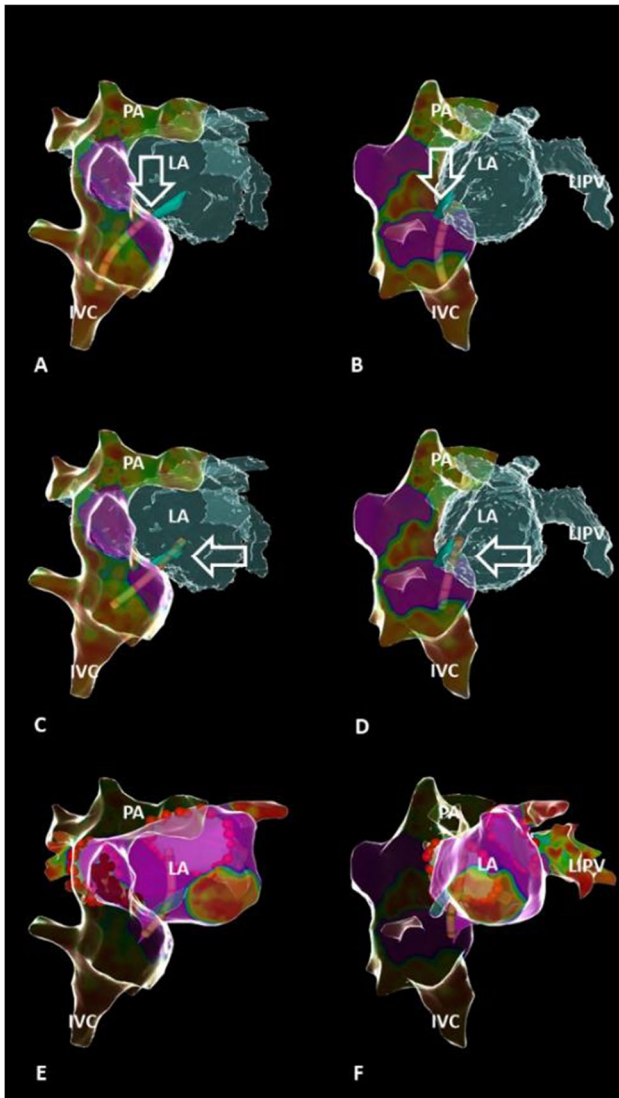
In patients with Fontan circulation, lateral intraatrial tunnel, and spontaneously closed lateral tunnel fenestration, transtunnel puncture (TP) might be required to perform ablation in the functional atrium (LA). We report of a patient with drug-refractory atrial arrhythmias and Fontan circulation. This case demonstrates a novel multimodal approach for TP using a steerable sheath (ViziGo, medium curve, Biosense Webster) allowing its visualization inside the 3D-mapping system to avoid the need of fluoroscopy. Intracardiac echography (ICE) was utilized in conjunction with merging the 3D reconstruction from previous magnetic resonance imaging-guided angiography to visualize the complex anatomy in real time and to rule out LA thrombus formation. TP was performed with a Brockenbrough needle BRK1. TP followed a stepwise approach: First, we performed 3D reconstruction of the Fontan tunnel in **A** RAO 30° and **B**

LAO 60° projection. Second, we determined the puncture site (turquoise mark; white arrow) using the visualization of the steerable sheath, a force-sensing catheter (ThermoCool SmartTouch SF, Biosense-Webster), and ICE. There was no evidence for a residual fenestration of the tunnel. The sheath was continuously visualized during TP and carefully advanced to the LA (**C** RAO 30° projection; **D** LAO 60° projection). After access to the LA, **E**, **F** pulmonary vein isolation was performed with ablation index-guided RF applications (red tags around the ipsilateral pulmonary veins in **E**, **F**). The clinical atrial tachycardia was induced, mapped, and ablated with substrate modification at the anterior atrial wall in close relationship to the Fontan tunnel (red tags in **E**; PA, pulmonary arteries; IVC, inferior vena cava; LIPV, left inferior pulmonary vein). There were no procedure-related complications.

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Declarations

Conflict of interest The authors declare no competing interests.

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