

## EP CASE REPORT

# Successful high-resolution left atrial mapping and catheter ablation of a complex supraventricular tachycardia with transeptal passage through an atrial shunt device

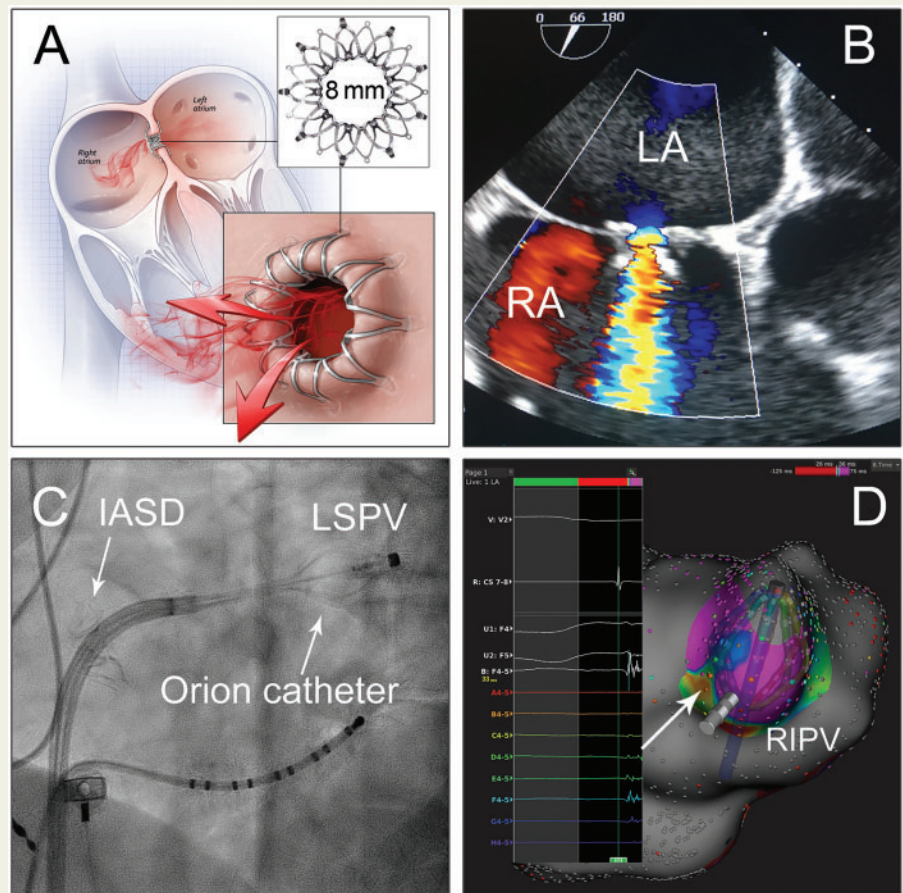
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In patients with heart failure with preserved ejection fraction (HFpEF), interatrial shunting performed by permanent devices placed in the interatrial septum is a new treatment concept. Shunting blood from the left to the right atrium reduces left atrial pressure (Figure 1A and B). The Corvia shunt (Corvia Atrial Shunt, Corvia Medical Inc., Tewkesbury, MA, USA) is an interatrial shunt device (IASD) which has shown to reduce left atrial pressure, and to improve heart failure symptoms and quality of life<sup>1</sup>; it is available in one size and has an inner diameter of 8 mm. We present a case report of left atrial reablation performed through an IASD on a patient with HFpEF by using the high-resolution (HR) Rhythmia mapping system (Boston Scientific, Marlborough, MA, USA) and the Orion basket catheter. The 76-year-old female patient was considered for repeat radiofrequency ablation of a symptomatic atrial tachycardia (AT) 6 months after the IASD implantation. Within the last 8 years, the patient has undergone four previous ablations: pulmonary vein isolation (PVI), re-isolation of the right superior pulmonary vein, ablation of the ganglionic plexi region, roof line ablation in the left atrium (LA), anterior mitral isthmus line ablation, and a cavotricuspid isthmus ablation (CTI). Due to a sick sinus syndrome, a double lead pacemaker was implanted and the start of antiarrhythmic medication (flecainide) was initiated, which led to freedom from arrhythmias over the last 12 months. However, due to recurrent symptomatic ATs, an atrioventricular node ablation and left atrial catheter ablation were



**Figure 1** A, Corvia Atrial Shunt (Courtesy of Corvia Medical Inc. Tewkesbury, MA, USA). B, Transesophageal Echocardiography with doppler image of left to right shunt.

C, LAO 30° view; The Agilis sheath is passed through the shunt (white arrow) with the Orion basket catheter within the left inferior pulmonary vein. D, The Orion basket catheter (Boston Scientific, Marlborough, MA) bipolar pair B-G 4-5 detects a highly fragmented late pulmonary vein signal (left in the picture) within the inferior part of the right inferior pulmonary vein (RIPV). The activation mapping (right) shows a conduction gap at the inferior part of the RIPV (white arrow).

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discussed with the patient. Reablation was opted for using HR Mapping and the Orion basket catheter which have proven to be beneficial for reablation outcomes.<sup>2</sup> Since cryoballoon PVI can be safely performed through the opening of the shunt,<sup>3</sup> we decided to perform the passage across the septum through the IASD. Before the start of the procedure transoesophageal echocardiography (TOE) revealed a regular function of the IASD (*Figure 1B*). Next, the IASD was crossed with a 5-F multi-purpose catheter under TOE and fluoroscopic guidance. A guide wire was placed in the left superior pulmonary vein and a 12-F deflectable sheath (Agilis, Abbott, USA) was easily delivered across the shunt. The LA was mapped by means of the Rhythmia mapping system and the Orion basket (*Figure 1C*). Mapping of the atria revealed electrical gaps within the right PVI (*Figure 1D*) and the CTI line. These were reablated with a 4 mm irrigated ablation catheter (Boston Scientific, Marlborough, MA, USA); clinical AT could not be induced. Despite the mid-fossa position of the shunt, the procedure could be performed effectively, without constraints. Movement of the sheath and the catheter was not limited by the shunt. After the procedure TOE revealed a continued normal function of the shunt. In the 4 months since the ablation, the patient has been free from atrial arrhythmias and has shown significant clinical improvement. Both atrial shunting for heart failure and catheter ablation-based rhythm control are disease-modifying therapeutic strategies in patients with HFpEF that may not preclude each other. This case report demonstrates the safety and feasibility of crossing an IASD to perform an HR mapping based ablation in the LA.

**Conflict of interest:** C.L. reports having received personal fees from Boston Scientific. All remaining authors have declared no conflicts of interest.

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