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Epicardial bypass tract at the left atrial diverticulum

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A 61-year-old man underwent catheter ablation for paroxysmal atrial fibrillation. Three-dimensional multidetector computed tomography revealed a diverticulum in the anterosuperior wall of the left atrium (LA) (*Figure 1*). Before ablation, the activation map in the LA during sinus rhythm revealed that the breakthrough sites were both the right-sided pulmonary vein (PV) carina and the top of the diverticulum (*Figure 2*, *Video 1*). The bipolar voltages inside the diverticulum were >1 mV. Circumferential antral PV isolation was performed without complications. A focal application at the carina was needed to isolate the right-sided PVs (Supplementary material online, *Figure S1*). No additional ablation steps related to the diverticulum were needed as no non-PV triggers originating from the diverticulum were induced. The patient has remained free from any atrial tachyarrhythmias for 11 months.

The breakthrough at the right-sided PV carina and suggested the existence of epicardial bypass tracts connecting the right atrium (RA)

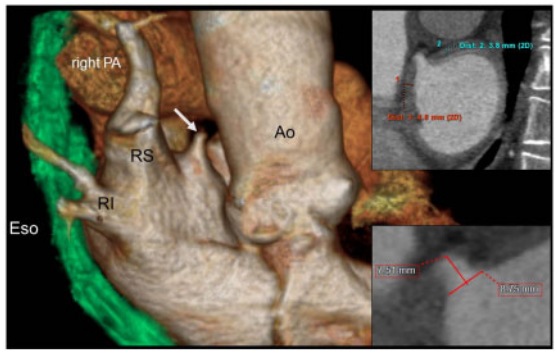

Figure 1 Three-dimensional computed tomography image. Three-dimensional computed tomography showed a diverticulum (white arrow) in the anterosuperior wall of the left atrium, close to the ascending aorta. The wall of the divertuculum was thinner than that of the adjacent left atrium (≈4 mm). The orifice width and body length of the diverticulum were 8.6 and 7.5 mm, respectively. Ao, ascending aorta; Eso, oesophagus; PA, pulmonary artery; RI, right inferior pulmonary vein; RS, right superior pulmonary vein.

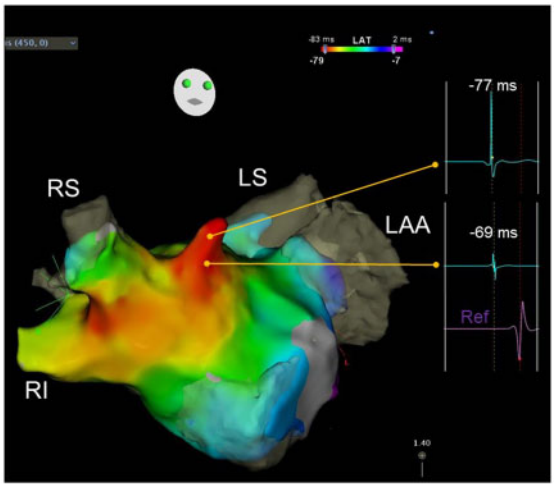

Figure 2 Three-dimensional map. Activation map obtained in the left atrium during sinus rhythm before ablation showed that the breakthrough sites were both the right-sided pulmonary vein carina and the top of the diverticulum. Local electrograms at the bottom and top of the diverticulum and their local activation times in relation to timing of a reference electrogram at the coronary sinus are shown. LAA, left atrial appendage; LS, left superior pulmonary vein; Ref, reference; RI, right inferior pulmonary vein; RS, right superior pulmonary vein.

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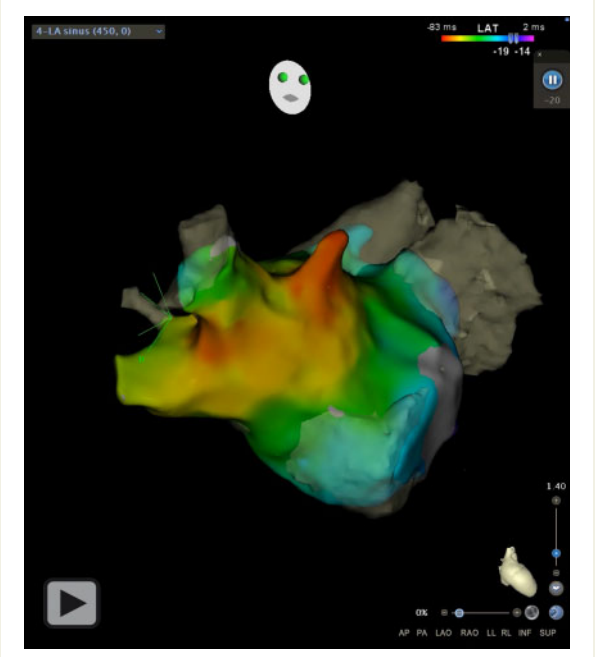

Video 1 Propagation map in the left atrium during sinus rhythm before ablation shows that the breakthrough sites were both the right-sided pulmonary vein carina and the top of the diverticulum.

and the right-sided PVs.[1] In addition, the centrifugal activation pattern from the top of the diverticulum implied an epicardial bypass tract connecting the top of the diverticulum and the RA or superior vena cava. Although there are several previous reports about epicardial bypass tracts between the RA and the right-sided PVs[1] and diverticula in the LA are not uncommon,[2] little is known about the association between epicardial bypass tracts and atrial diverticula. However, the epicardial bypass tract attached to the diverticulum can be an arrhythmogenic structure, as was shown in a report of a macro-re-entrant atrial tachycardia utilizing an epicardial connection at the LA diverticulum.[3] If the non-PV trigger from the diverticulum is identified,[4] not only encircling the ostium of the diverticulum but also ablation to the RA insertion site would be necessary for its disconnection from both atria. Direct ablation to the diverticulum may not be recommended to avoid the risk of perforation.

Supplementary material

Supplementary material is available at *European Heart Journal - Case Reports* online.

Consent: The authors confirm that written consent for submission and publication of this case report including images and associated text has been obtained from the patient in line with COPE guidance.

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