

Epicardial macroreentrant atrial tachycardia involving a large left atrial roof diverticulum: insights using high-resolution coherent mapping

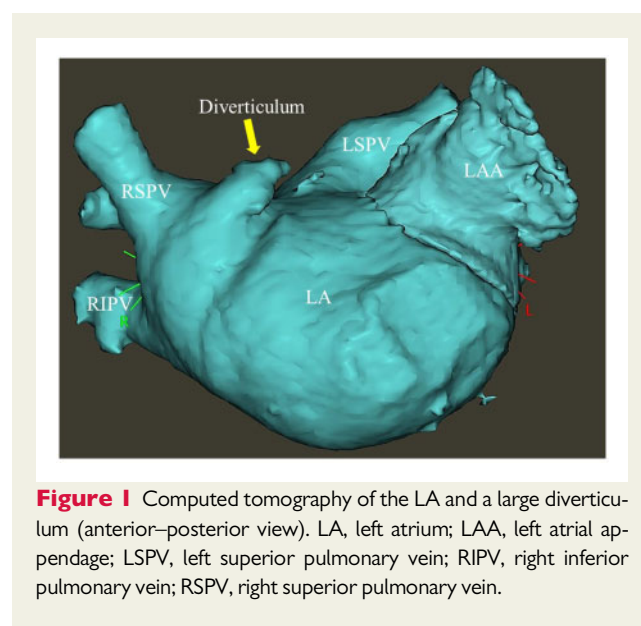
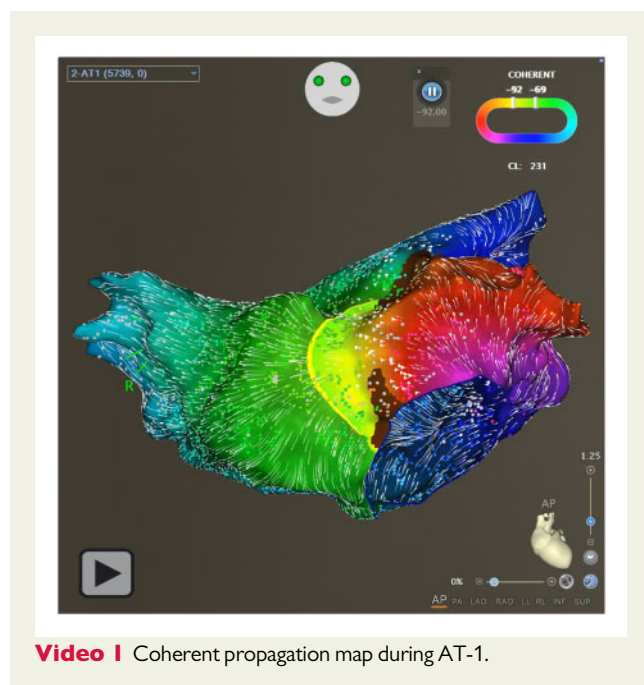
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A 75-year-old woman with hypertrophic cardiomyopathy and symptomatic atrial tachycardia (AT) was admitted for first-time catheter ablation ([Supplementary material online, Figure S1](#)). Entrainment during AT-1 (cycle length: CL = 230 ms) from both the left atrial (LA) roof and mitral annulus (MA) revealed that both sites were within the circuit. A high-resolution electroanatomic map of the left atrium was created using a PentaRay catheter with the CARTO mapping system (Biosense Webster, Diamond Bar, CA, USA). Activation mapping was performed, and the Coherent module (CARTO, Biosense

Webster, Diamond Bar, CA, USA) was used to display the colour and conduction velocity vectors for the electrical wave propagation.¹ [Video 1](#) shows the Coherent propagation map during AT-1, which was consistent with a dual loop macroreentry with roof-dependent and MA circuits. After creation of a linear ablation lesion set from the MA to the anterior left superior pulmonary vein, AT-1 transformed to another AT (AT-2, [Supplementary material online, Figure S2](#)) with a different propagation pattern. Activation mapping of the endocardial LA clearly demonstrated that the activation started from the summit of a large diverticulum on the LA roof ([Figure 1](#), [2](#), [Supplementary material online, Figure S3](#)), propagating to its base and



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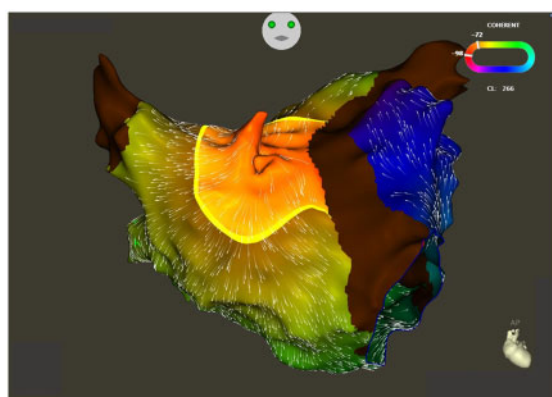
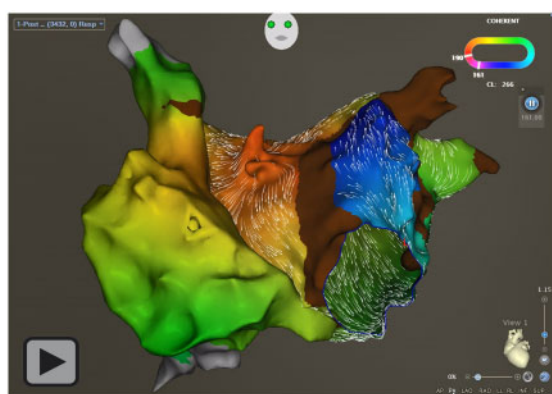


Figure 2 Coherent propagation map during AT-2.



Video 2 Coherent propagation map during AT-2.

then the left atrium and right atrium ([Video 2](#)). The mapped propagation time in the left atrium was 235 ms, which did not cover the total AT-2 CL (265 ms), and the 30 ms difference was regarded as the conduction time through the epicardial tissue. Entrainment mapping

demonstrated that the circuit of AT-2 included the proximal and distal coronary sinus and diverticulum ([Supplementary material online, Figures S4 and S5](#)). Therefore, like AT-1, AT-2 was speculated to also be a counter clockwise perimitral atrial flutter. Since the endocardial aspect of the left atrium was blocked, propagation was felt to use epicardial connections along the anterior LA wall utilizing the diverticulum before entering the endocardial left atrium. AT-2 was terminated during radiofrequency catheter ablation around the base of diverticulum, after which AT-2 was rendered non-inducible. Voltage mapping demonstrated large areas of bipolar voltage abnormality at the anterior and perimitral LA ([Supplementary material online, Figure S6](#)), and which may have provided the substrate for sustaining tachycardia. High-density Coherent mapping was able to visualize the circuit of an unusual macroreentrant AT utilizing an epicardial connection associated with an LA roof diverticulum, which to the best of our knowledge, has not been previously reported.

Supplementary material

[Supplementary material](#) is available at *European Heart Journal - Case Reports* online.

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Consent: The author/s confirm that written consent for submission and publication of this case report including image(s) and associated text has been obtained from the patient in line with COPE guidance.

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Reference

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