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Pulmonary vein ablation in a patient with a large left common pulmonary vein joining a large right common trunk

Philipp Bengel [1]*, Jonas Herting[1], Markus Zabel [1], and Lars Lüthje [1,2]

[1]Department of Cardiology and Pneumology, Heart Center, Georg-August University Göttingen, Robert-Koch-Str. 40, 37075 Göttingen, Germany; and [2]Herz & Gefäßzentrum Göttingen, Göttingen, Germany

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We report the findings of a 57-year-old patient who was referred to our hospital with recurrent episodes of symptomatic persistent atrial fibrillation (AF). An electrocardiogram-triggered contrast-enhanced cardiac computer tomography (SOMATOM® Definition Flash, Siemens) was performed before the procedure to integrate left atrial anatomy into the electroanatomic mapping system (CARTO®3 Merge, Biosense Webster, USA). The computed tomography (CT) revealed a highly unusual, previously unreported pulmonary vein (PV) variant consisting of a large left common PV (LCPV) joining a large right common PV trunk which separates into a right superior pulmonary vein (RSPV) and right inferior pulmonary vein (RIPV), as well as an accessory right PV (*Figure 1* and Supplementary material).

PV variants can be seen in about 50% of patients with AF, which constitutes a higher prevalence than in patients without history of AF.[1] Interestingly, AF-recurrence in patients with non-regular PV is higher despite an acutely complete PV isolation.[2] Pre-procedural imaging can be helpful to optimize ablation strategies.[3]

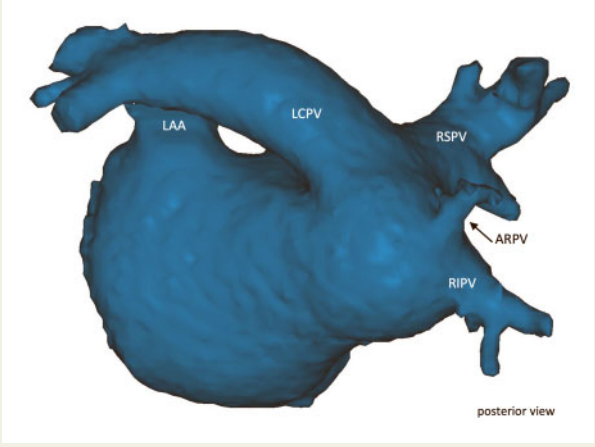

Figure 1 Integrated three-dimensional computed tomography of the left atrium in a posterior view within the electroanatomic mapping system (CARTO®3, Biosense Webster, USA). ARPV, right accessory pulmonary vein; LAA, left atrial appendage; LCPV, left common pulmonary vein; MVO, mitral valve orifice; RIPV, right inferior pulmonary vein; RSPV, right superior pulmonary vein.

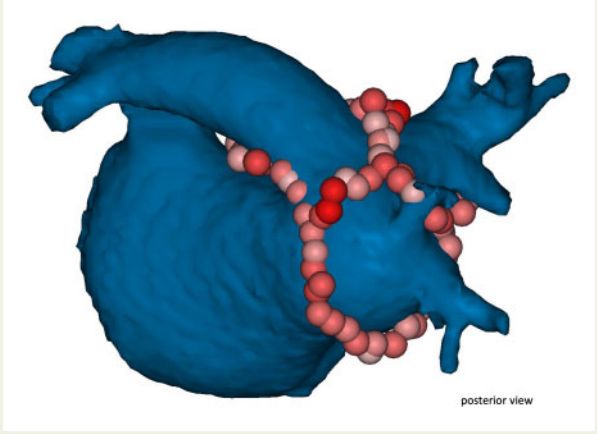

Figure 2 Left atrium in the posterior view after ablation; circumferential ablation was performed around the large right PV common trunk, additional linear ablation lesions were added between RSPV and RIPV, as well as PSPV and LCPV.

* Corresponding author. Tel: +49 551 39 10965, Email: philipp.bengel@med.uni-goettingen.de
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Especially, it may help choosing between radiofrequency or balloon-based techniques and the selection of balloon and mapping catheter size.

First, 3D reconstruction of the left atrium was done using a 3.5 mm CARTO® THERMOCOOL SMARTTOUCH® SF Catheter and merged with the CT, followed by circumferential point-by-point radiofrequency ablation (SMARTABLATE RF generator, Stockert, Germany) of the large right common trunk. 40 W were applied on the anterior wall, only 30 W posteriorly. Because complete isolation of the PVs could not be achieved, additional linear ablation lesions were added between RSPV and RIPV, and between RSPV and LCPV (*Figure 2*). This led to bi-directional PV-block verifiable with a circular mapping catheter (LASSO®, Biosense Webster, USA) positioned in all PVs. At the end of the procedure, however, pericardiocentesis (360 mL) was necessary due to a pericardial tamponade. Follow-up (history and EGM interrogation from chronically implanted dual-chamber pacemaker) revealed freedom from AF 3 months after the ablation.

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.

Conflict of interest: none declared.

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