implantation clinical trials: a consensus report from the Valve Academic Research

appendage closure: results from the WATCHMAN left atrial appendage system for
embolic protection in patients with AF (PROTECT AF) clinical trial and the contin-

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Pulmonary vein collateral formation as a long-term result
of post-interventional pulmonary vein stenosis

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Five years ago, a 54-year-old woman with a history
of paroxysmal atrial fibrillation and symptoms of
fatigue and palpitations underwent pulmonary
vein isolation under 3D mapping system guidance.
Symptoms improved after the procedure and she
remained in sinus rhythm. However, shortness of
breath and haemoptysis developed 4 months after
the ablation procedure due to subtotal stenosis of
the left superior (LSPV) and significant stenosis of
the left inferior pulmonary vein (LIPV). Balloon
angioplasty was performed but moderate stenosis
of LIPV recurred shortly thereafter; due to only
mild symptoms no further intervention was
performed at the time.

During current routine follow-up, the patient
presented free from arrhythmia and was largely
asymptomatic. Cardiovascular magnetic resonance
(CMR) contrast-enhanced three-dimensional angi-
ography revealed large collaterals draining blood
from the totally occluded left inferior pulmonary
vein into the left superior pulmonary vein as evi-
denced on successive first and second dynamic
CMR imaging (dynamic scan duration: 12 s; Panels
A and B; see Supplementary material online, Movie
S1). In addition, high-resolution k-t accelerated
CMR lung perfusion imaging demonstrated significant hypoperfusion of the left lower lobe (Panel C, see Supplementary material online, Movie S2).

Panel (A) First dynamic of contrast-enhanced three-dimensional cardiovascular magnetic resonance angiography of the pulmonary
veins (p.a.-view). Total occlusion of the left inferior pulmonary vein origin; the remaining three pulmonary veins showed no stenosis.
(B) Second dynamic of contrast-enhanced three-dimensional cardiovascular magnetic resonance angiography of the pulmonary veins
(p.a. view). Delayed contrast filling of peripheral left inferior pulmonary vein branches draining via extensive collaterals originating
from the left superior pulmonary vein into the left atrium. (C) High-resolution k-t accelerated cardiovascular magnetic resonance
lung perfusion imaging identified an extensive perfusion deficit of the left lower lobe (coronal orientation).

Supplementary material is available at European Heart Journal online.

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