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IMAGES IN INTERVENTION

Double Trouble

Percutaneous Disobstruction of 2 Pulmonary Veins Following Catheter Ablation for Atrial Fibrillation

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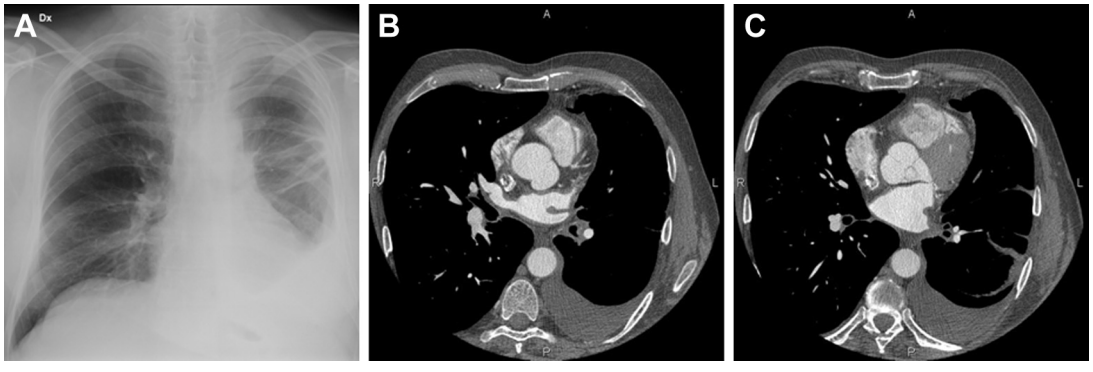
A 54-year-old man, who had previously undergone 2 radiofrequency catheter ablations of the pulmonary veins for recurrent atrial fibrillation, came to our attention for dyspnea. A chest x-ray showed left pleural effusion and a subsequent computed tomography scan with contrast medium revealed occlusion of both the superior and inferior left pulmonary veins (**Figure 1**). In addition, a lung perfusion scan demonstrated that the left lung was completely excluded (**Figure 2**). On the basis of these data, it was decided to attempt to disobstruct the veins percutaneously.

Interatrial transseptal puncture was carried out with a dedicated needle via an 8-F Mullins catheter and obstruction of the 2 left pulmonary arteries was confirmed angiographically (**Figure 3**, Online Videos 1, 2 and 3). A 6-F Judkins right guiding catheter was then inserted into the Mullins catheter and, after engaging the superior left vein, the occlusion was passed with a 0.014-inch coronary guidewire. Subsequently, angioplasty was performed with sequentially larger balloons (2.5 × 30 mm and 3.5 × 30 mm Sprinter Legend, Medtronic) (**Figure 3**). Following exchange with a 0.035-inch wire and a 10-F Mullins catheter, the

FIGURE 1 Pre-Procedural Chest X-Ray and Computed Tomography Scan



Evident left pleural effusion at chest x-ray **(A)**. Superior and inferior left pulmonary vein occlusion at computed tomography (**B** and **C**, respectively).

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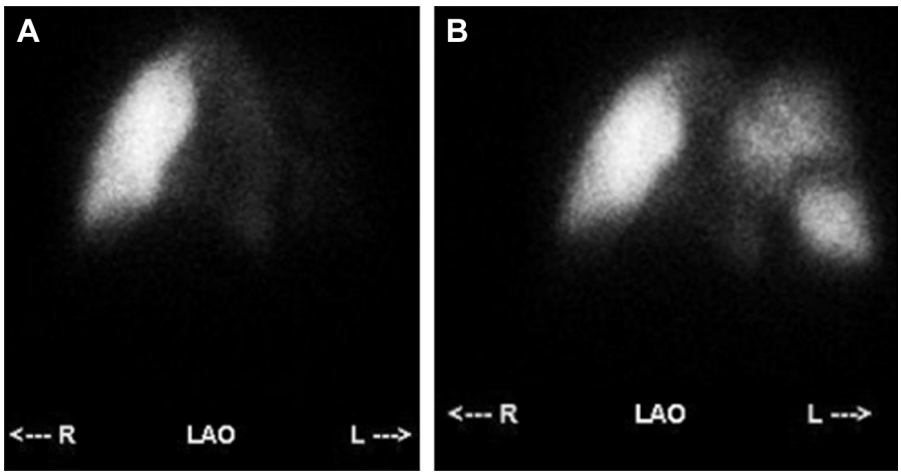
FIGURE 2 Lung Perfusion Imaging

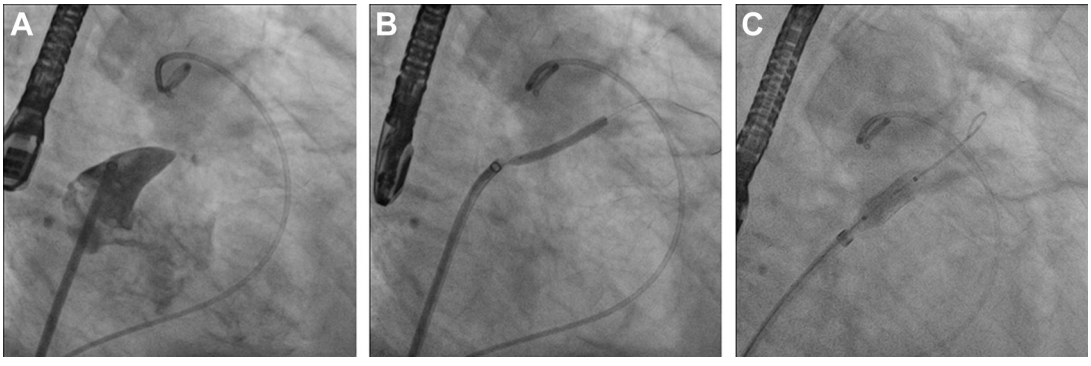


Lung perfusion scan before **(A)** and after **(B)** stenting. L = left; LAO = left anterior oblique; R = right.

vein was dilated with a 4 × 40 mm Foxcross balloon (Abbott, Abbott Park, Illinois). Finally, an Andrastent 13XL stent (Andramed GmbH, Reutlingen, Germany) was deployed (**Figure 3**, Online Videos 4 and 5). For the inferior left pulmonary vein, a similar technique was employed, but stenting was performed with a Genesis Opta Pro 7 × 12 mm stent (Cordis Corporation, Miami Lakes, Florida) (Online Videos 4 and 5). At follow-up, the patient's symptoms improved significantly and a second computed tomography scan showed patency of the two stents (**Figure 4**). Lung perfusion scan was also repeated and perfusion of the left lung improved significantly (**Figure 2**).

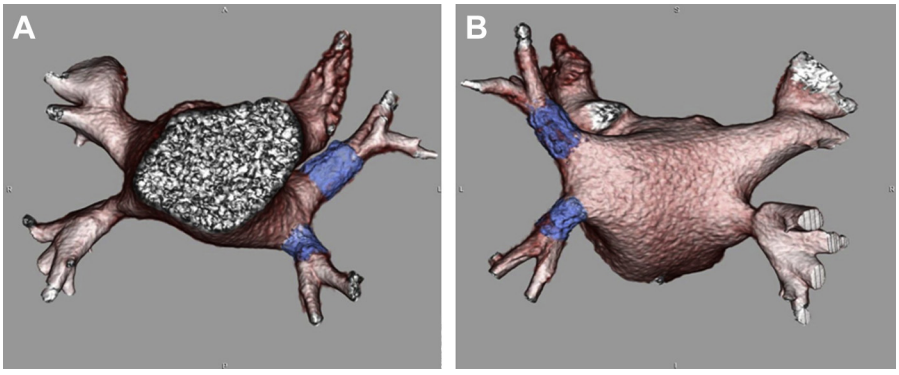
Pulmonary vein occlusion is a rare complication of catheter ablation and simultaneous occlusion of 2 pulmonary veins is even less common with a reported incidence of roughly 0.3% (1). Clinical presentation may be silent or patients may present with symptoms

FIGURE 3 Intraprocedural Angiograms



Documentation of superior pulmonary vein occlusion at invasive angiography **(A),** followed by balloon angioplasty **(B)** and stenting **(C)**. See accompanying Online Videos 1, 2, 3, 4, and 5.

FIGURE 4 Post-Procedural Imaging



Follow-up computed tomography 3-dimensional reconstruction of the left atrium and pulmonary veins in the anterior-posterior **(A)** and posterior-anterior **(B)** views.

such as cough, dyspnea, chest pain, and hemoptysis. Various therapeutic strategies have been proposed, ranging from percutaneous intervention to pulmonary lobectomy and surgical repair with pulmonary homograft tissue (2).

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KEY WORDS catheter ablation, dyspnea, pulmonary vein stenosis, stent

APPENDIX For supplemental videos and their legends, please see the online version of this article.