A 37-year-old man was referred for recurrent atrial fibrillation. Surface and transesophageal echocardiography (TEE) showed his heart to be structurally within normal limits. He underwent electrophysiological testing with multisite atrial mapping, which revealed a focal trigger for atrial fibrillation within the left upper pulmonary vein (LUPV). Radiofrequency catheter ablation was performed. Several weeks later, he developed dyspnea and cough while jogging despite maintenance of sinus rhythm.

Repeat TEE revealed high-velocity flow within the left atrium (LA) emanating from the LUPV, with peak velocities more than twice that of the right upper pulmonary vein (RUPV) (see Figure). This suggests a pressure gradient (PG) within the LUPV that is 5-fold higher than normal, consistent with high-grade stenosis. After 3 minutes of moderate hand-crank exercise, this gradient increased to 24 mm Hg in the LUPV and only to 6 mm Hg in the RUPV (see Figure). Localized pulmonary venous hypertension of this degree may be sufficient to cause exertional symptoms.

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TEE color flow Doppler (CFD) and continuous-wave Doppler (CWD) of flow signal from RUPV (top panels) and LUPV (bottom panels) in LA. Flow from RUPV (top left) is laminar, whereas flow from LUPV (bottom left) is aliased. Center panels show that aliased flow signal is associated with higher flow velocity (V) and pressure, suggesting stenosis of LUPV. Hand-crank exercise for 3 minutes (right panels) further accentuated difference between normal and obstructed flow. Values for peak velocities and pressures under each panel correspond to location of manually positioned cursor. Note, velocity scales differ among flow tracings.
Left Upper Pulmonary Vein Stenosis 2 Months After Radiofrequency Catheter Ablation of Atrial Fibrillation
Richard H. Sohn and Nelson B. Schiller

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