

## Pulmonary Arteriovenous Malformations

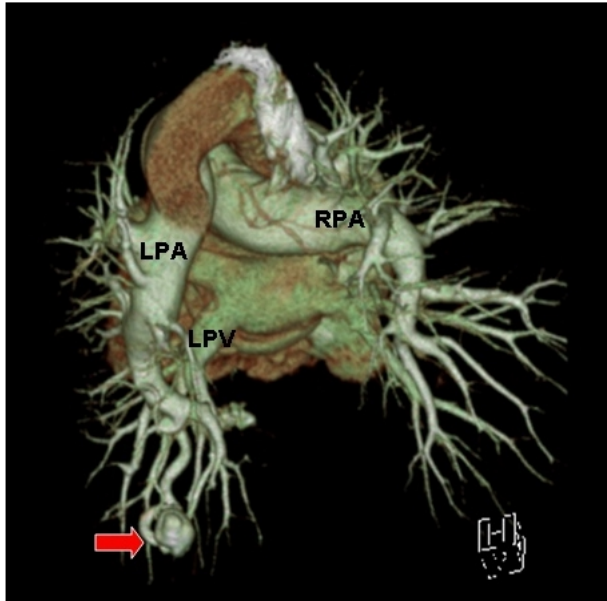
Jong-Won Ha, MD, Jae-Young Choi, MD, Byoung-Wook Choi, MD,  
Seok-Min Kang, MD, Se-Joong Rim, MD, Yangsoo Jang, MD,  
Namsik Chung, MD, Won-Heum Shim, MD, Seung-Yun Cho, MD

Departments of Internal Medicine, Pediatrics, and Radiology, Yonsei University College of Medicine, Seoul, Korea

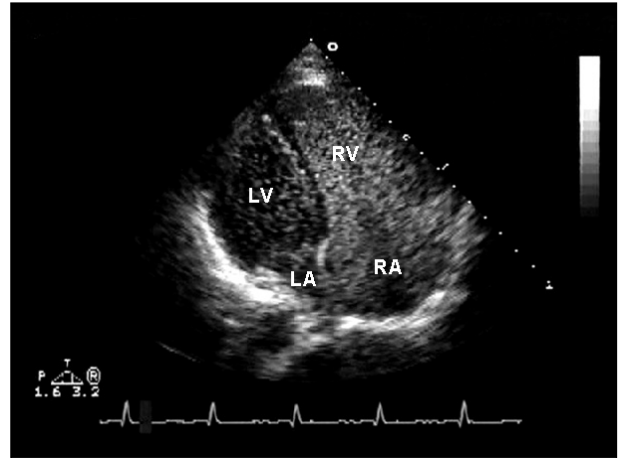
Pulmonary arteriovenous malformations represent a direct communication between one or more pulmonary arteries and one or more pulmonary veins. Common anatomic forms include single sacs ranging from 1 to >10 cm in diameter, macroscopic tangles, and microscopic telangiectases. The main complications of pulmonary arteriovenous malformations are believed to relate to right-to-left shunting of blood through the pulmonary arteriovenous malformations and include stroke and brain abscess, which together occur in up to one half of patients if untreated. However, the association of pulmonary hypertension is not common. In this case, a young woman with a pulmonary arteriovenous fistula localized to the left lower lobe coexisting with pulmonary hypertension is described.

A 42-year-old woman was evaluated for progressively worsening exertional dyspnea. Her past medical history was unremarkable. The electrocardiogram revealed sinus rhythm with right ventricular hypertrophy with strain. Transthoracic echocardiography showed enlarged right atrium and ventricle

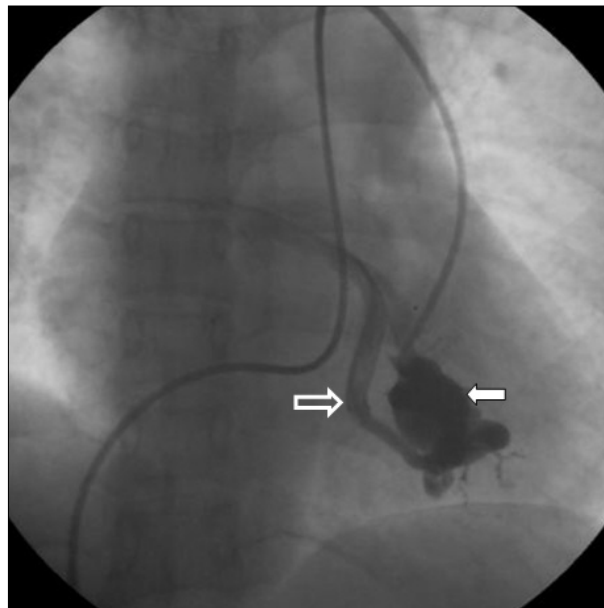
with elevated right ventricular systolic pressure (tricuspid regurgitant jet velocity 4.8 m/s). There was no evidence of pulmonic stenosis. Chest computed tomography was performed to rule out chronic pulmonary embolism and revealed multiple pulmonary arteriovenous fistulas on the left lung, the largest (17mm) on left lower lobe-posterior basal segment, middle on the left lower lobe-medial basal segment, and the smallest on anterior segment of left upper lobe (Fig. 1). Contrast echocardiography was performed by intravenous injection of hand-agitated saline while visualizing the atria. Contrast appears in the left atrium 3 to 5 seconds after it is seen in the right atrium, suggestive of pulmonary arteriovenous fistula (Fig. 2). On cardiac catheterization, peak systolic and diastolic pressures of main pulmonary artery were 90 and 35 mmHg, respectively. Mean pulmonary artery wedge pressure was 11 mmHg. Angiography revealed a huge pulmonary arteriovenous fistula in the middle and lower lobes of the left lung (Fig. 3). The patient decided to be treated conservatively and discharged.



**Fig. 1.** Three-dimensional images of a left lower lobe pulmonary arteriovenous malformations evaluated with spiral CT. Pulmonary arteriovenous malformations consisting of a single feeding artery (arrow) and a single draining vein (arrowhead), both connected to the aneurysmal sac (open circles).



**Fig. 2.** Modified apical 4-chamber view of two-dimensional contrast echocardiogram with peripherally injected contrast agent (hand-agitated saline). Contrast appearing in left atrium by pulmonary veins after delay.



**Fig. 3.** Selective pulmonary angiogram obtained in the left pulmonary artery in an anteroposterior projection shows a 2-cm pulmonary arteriovenous malformations (white arrow) and dilated draining vein (open arrow).