

IMAGES IN INTERVENTION

Transcatheter Autologous Transfusion to Maintain Pulmonary Circulation During Balloon Pulmonary Angioplasty

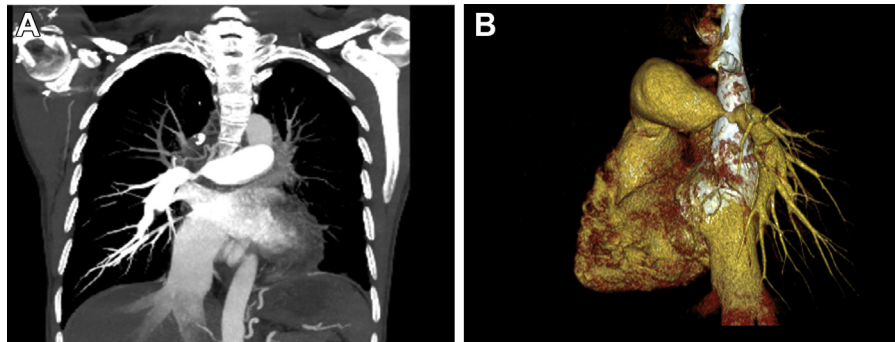


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A 40-year-old man was admitted with symptomatic pulmonary stenosis in Takayasu arteritis. Computed tomographic pulmonary angiography demonstrated no blood flow in the left lung and a severe narrowing in the right main pulmonary artery (Figure 1). Pulmonary angiography showed reduced perfusion in the right lung (Figure 2A). Balloon pulmonary angioplasty (BPA) was attempted in the right pulmonary artery, but

BPA was ceased because the patient had a seizure during balloon dilation. We suspect that the seizure was triggered by transient loss of blood flow in the brain during balloon dilation, which blocked the only pulmonary artery that connected the right heart and the lungs. To maintain pulmonary blood flow during balloon angioplasty, a 6-F long introducer sheath was advanced to the right pulmonary artery and successfully crossed the lesion to deliver blood,

FIGURE 1 CTPA Demonstrating a Severe Stenosis in the Right Pulmonary Artery and No Blood Flow in the Left Pulmonary Artery



(A) A representative image from computed tomographic pulmonary angiography (CTPA). (B) 3-dimensional multiplanar reconstruction of CTPA.

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Manuscript received April 22, 2018; revised manuscript received May 7, 2018, accepted May 15, 2018.

FIGURE 2 Pulmonary Angiography Before, During, and After Balloon Pulmonary Angioplasty

(A) Pulmonary angiography demonstrating a severe stenosis in the right pulmonary artery. (B) Balloon pulmonary angioplasty (BPA). A long introducer sheath (green arrow) crosses the lesion and delivers autologous blood to maintain pulmonary blood flow during balloon dilation (red arrow). (C) After BPA, pulmonary angiography demonstrates reduced stenosis and better perfusion in the right lung.

which was collected from the patient's atria and anti-coagulated with heparin before BPA. The blood was then injected using syringes at a speed of about 10 ml/s during balloon dilation (Figure 2B); this technique successfully prevented seizure. After balloon dilation, the narrowing of the right pulmonary artery was reduced (Figure 2C), and the blood pressure in the pulmonary artery trunk decreased from 96/12 to 68/10 mm Hg. One-week follow-up after BPA indicated that New York Heart Association functional class had improved from IV to II.

It has been previously described that BPA is safe and effective for patients with pulmonary artery stenosis caused by Takayasu arteritis (1-3). This case is unique in demonstrating that BPA in the major pulmonary artery may transiently block blood

circulation and induce ischemic complications such as seizure. Using a catheter to deliver blood advanced to the lesion is an effective way to maintain pulmonary circulation and thus prevent ischemic complications.

ACKNOWLEDGMENT The authors thank Dr. Yingyun Fu, Shenzhen People's Hospital, for follow-up of the patient reported.

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KEY WORDS balloon pulmonary angioplasty, pulmonary artery stenosis, transcatheter transfusion