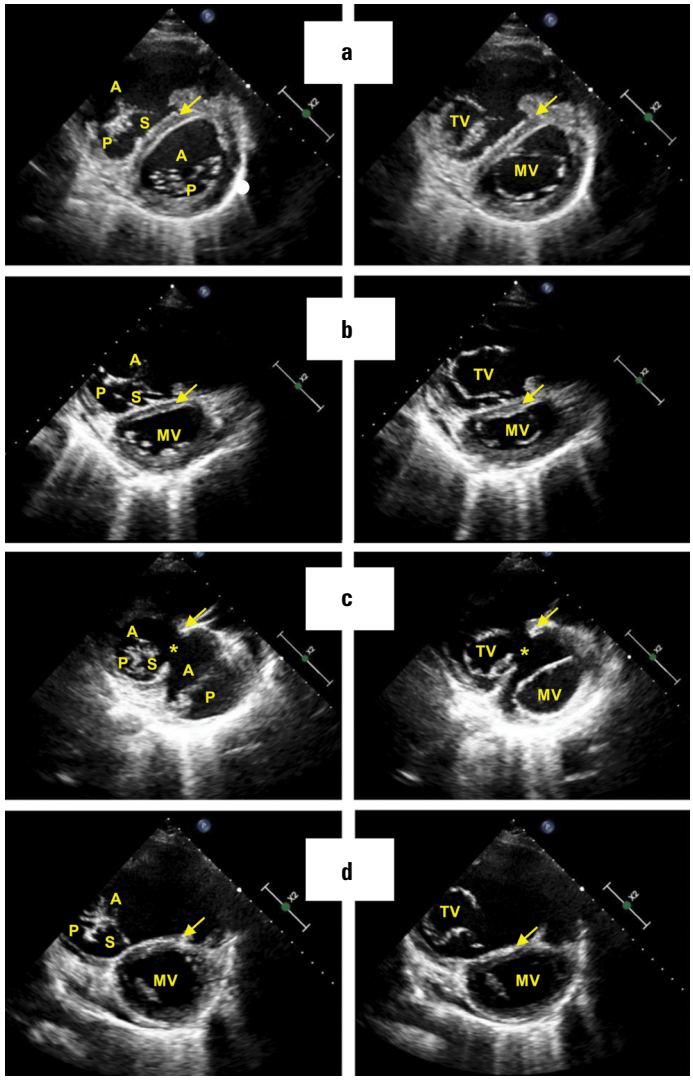

Figure 2. Modifying the standard projections by slight tilting and excursion of the transducer; along with the mitral valve, parasternal cross-sectional short-axis views (closed states in left panels, open states in right panels) of the tricuspid valve could be obtained in patients with PAH. Representative cases were diagnosed with pulmonary veno-occlusive disease (Fig. 2a), residual PAH following the closure of patent ductus arteriosus (Fig. 2b; Video 3), and secondary PAH due to unoperated ventricular (Fig. 2c) and atrial (Fig. 2d) septal defects, respectively

TV - tricuspid valve; MV - mitral valve; S, A, P - septal, anterior, and posterior cusps of the tricuspid valve, respectively; AP -anterior and posterior cusps of the mitral valve, respectively; arrows indicate the interventricular septum, and asterisk indicates the ventricular septal defect

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Video 1. Video displays short-axis cross-sectional view of the tricuspid structure of the pulmonary valve (simultaneous Mercedes sign along with the aortic valve is notable) of a patient who was finally diagnosed with concomitant residual PAH following congenital heart disease correction surgery (details of the defect are unknown) and chronic thromboembolic pulmonary hypertension (obtained by modified parasternal short-axis view)

Video 2. Video displays the tricuspid structure of the pulmonary valve in a patient diagnosed with idiopathic PAH (obtained by modified parasternal short-axis view)

Video 3. Video displays short-axis cross-sectional en-face view of the tricuspid valve (along with the bicuspid mitral valve) at parasternal short-axis in a patient with residual PAH following the closure of patent ductus arteriosus

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Biventricular outflow obstruction in a patient with a large sinus of the Valsalva aneurysm

Aneurysms of the sinus of Valsalva are defined as an abnormal enlargement of any of the three aortic sinuses. Congenital and acquired forms have been recognized. The right coronary sinus is the most common affected sinus, followed by non-coronary and left coronary sinuses (1). The prevalence of this anomaly is 0.09% in the general population (2).

Unruptured aneurysms of the sinus of Valsalva are usually asymptomatic. However, symptomatic cases have also been reported (1, 2).

We report a rare case of aneurysm of the sinus of Valsalva that resulted in right ventricular outflow tract (RVOT) obstruction with concomitant sub-valvular aortic web, causing severe left ventricular outflow tract obstruction, which we believe has not been published previously.

A 38-year-old woman underwent echocardiography in our department due to dyspnea (New York Heart Association functional class II), which demonstrated tricuspid aortic leaflets with a very large aneurysm of the right sinus of Valsalva, causing a compressing effect on RVOT, severe sub-pulmonary stenosis, right ventricular hypertrophy, and RVOT thickening. There was also a

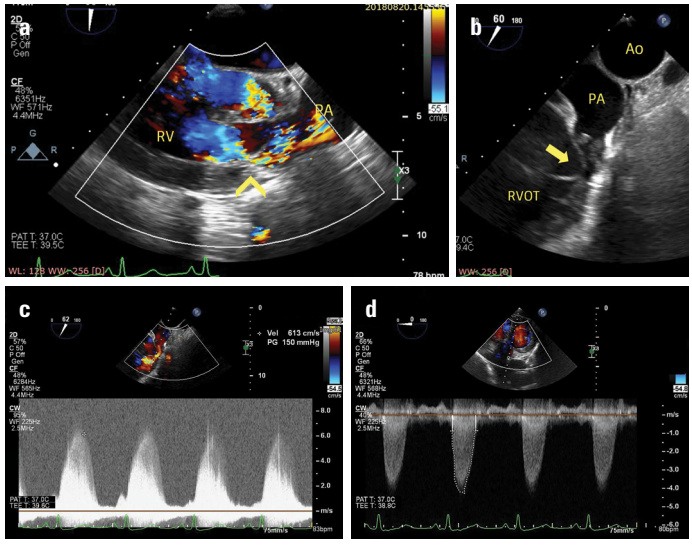

Figure 1. (a) Transesophageal echocardiography (TEE) mid-esophageal view showing the dilated sinus of Valsalva and its compressive effect on the right ventricular outflow tract (arrowhead). Note the systolic turbulence in the right and left ventricular outflow tract regions. (b) TEE upper esophageal level showing the compressive effect of the dilated sinus of Valsalva on the right ventricular outflow tract and pulmonary valve leaflets (arrow). (c) Continuous wave Doppler tracing demonstrating the sub-pulmonary severe stenosis gradient. (d) Continuous wave Doppler tracing showing severe sub-aortic stenosis gradient obtained from transgastric TEE view

sub-aortic membrane (2 mm proximal to the aortic valve) with severe sub-valvular aortic stenosis (Fig. 1 and Videos 1, 2, and 3). Moderate aortic regurgitation was also noted.

Left and right heart catheterization confirmed the echocardiographic findings (Fig. 2), and the patient was consequently scheduled for surgery. Aneurysm repair with resection of the sub-aortic membrane was performed. The patient's symptoms were alleviated, and she was discharged in a good condition.

Informed consent: A written informed consent obtained from the patient.

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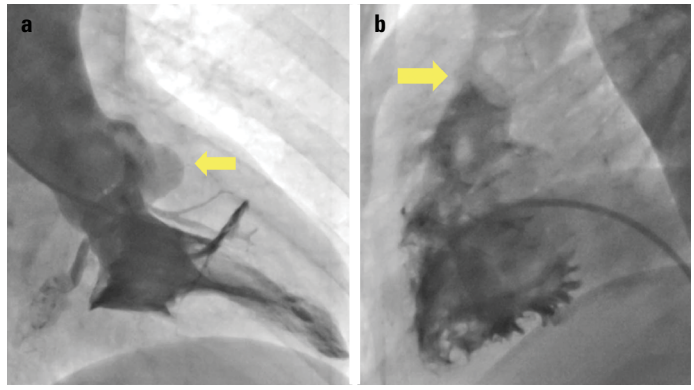

Figure 2. (a) Left ventricular injection demonstrating the dilated sinus of Valsalva (arrow). (b) Right ventricular injection in lateral view demonstrating sub-valvular obstruction due to the compressive effect of the dilated sinus (arrow)

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Video 1. TEE upper esophageal level showing the compressive effect of the dilated sinus of Valsalva on the right ventricular outflow tract and pulmonary valve leaflets

Video 2. TEE mid-esophageal level demonstrating the sub-valvular membrane just beneath the aortic valve leaflets

Video 3. TEE mid-esophageal level showing the dilated sinus of Valsalva and its compressive effect on the right ventricular outflow tract

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