Clear demonstration of platypnea-orthodeoxia syndrome during transesophageal echocardiography

An 86-year-old male patient visited a cardiology outpatient clinic with dyspnea, which was prominent on standing. His blood pressure was 138/76 mm Hg and heart rate was 96/bpm. Pulse-oximeter revealed an oxygen saturation (SpO_2) level of 98% in supine position; however, it decreased to 82% in the sitting position (Fig. 1a). The patient was examined for the differential diagnosis of the platypnea-orthodeoxia syndrome (POS). We performed transthoracic echocardiography (TTE), and contrast transition from the right atrium (RA) to the left atrium (LA) was observed in the sitting position (Video 1). Transesophageal echocardiography (TEE) was performed to obtain a detailed visualization of interatrial septum (IAS). Patent foramen ovale (PFO) tunnel was observed in TEE and a color Doppler imaging performed revealed a transition from LA to RA in the supine position (Fig. 2a, 2b). Contrast injection from right upper extremity vein was performed, and no transition was observed in the supine position (Fig. 2c, Video 2). Thereafter, the patient was instructed to be in the sitting position while performing TEE, and an opening of PFO tunnel was detected (Fig. 2d, Video 3). Contrast transition from RA to LA was observed in the sitting position (Fig. 2e, Video 4). The diagnosis of PFO and POS was confirmed, and a transcatheter PFO closure was decided as the

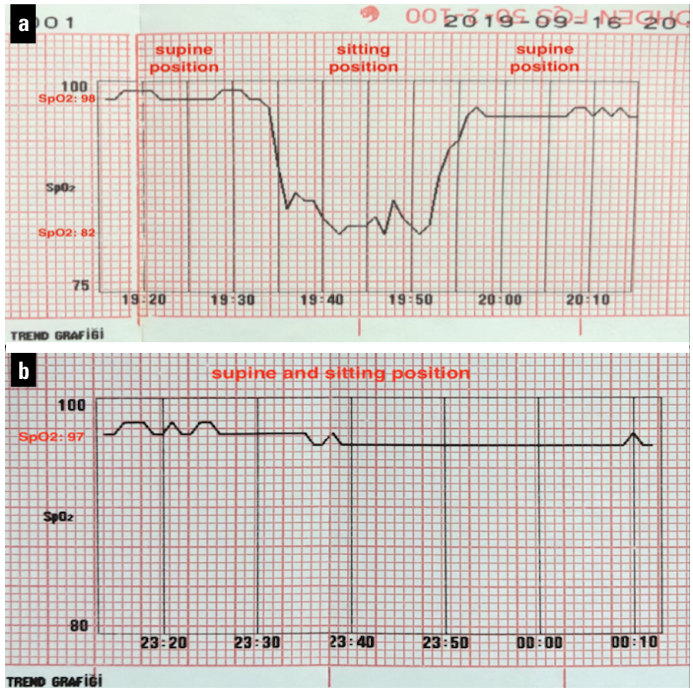

Figure 1. (a) Simultaneous oxygen saturation (SpO_2) monitoring reveals the desaturation of the patient when instructed to shift from a supine position to a sitting position in the room air. (b) Simultaneous SPO_2 monitoring after the patent foramen ovale closure is shown

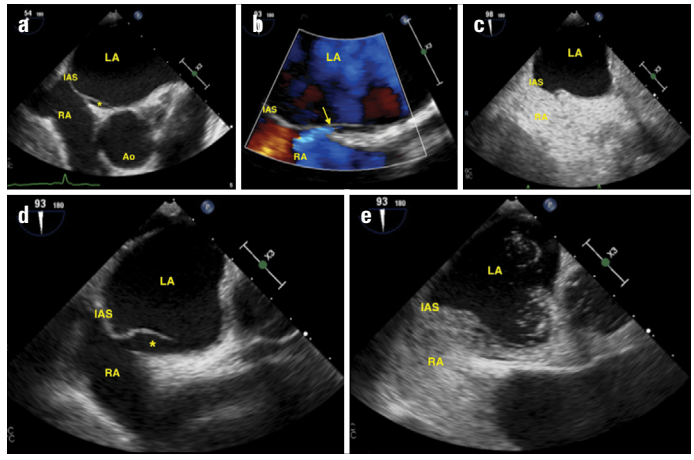

Figure 2. (a) Transesophageal echocardiography (TEE) in the mid-esophageal short-axis view reveals a patent foramen ovale (PFO) tunnel (asterisk) in the supine position. (b) TEE in mid-esophageal bicaval view using color Doppler imaging shows a PFO tunnel (arrow) in the supine position. (c) Contrast-enhanced TEE performed in the supine position did not reveal any right-to-left shunt. (d, e) Contrast TEE obtained in the sitting position shows the PFO slit, which widened to 7 mm (asterisk), and a right-to-left multiple contrast transition

treatment strategy. The Occlutech Figulla Flex II Occluder Device (27×33 mm) was inserted to IAS. Following PFO closure, SpO_2 was found to be normal in sitting position (Fig. 1b). TTE was performed with contrast injection, and the transition from IAS did not appear in both positions (Video 5). The patient's symptoms resolved following the procedure. POS is a rare clinical phenomenon that appears with positional symptoms and SpO_2 changes. This syndrome is mostly associated with causes leading to an intracardiac shunt, such as PFO. Although TTE is important in cases where an intracardiac shunt is suspected, the definitive diagnosis is obtained by TEE in most patients. In these patients, contrast-enhanced TEE should be performed in the sitting position as well.

Informed consent: Infromed consent was obtained from the patient.

Video 1. Transthoracic echocardiography with contrast injection reveals right-to-left shunting in the sitting position.

Video 2. Contrast-enhanced transesophageal echocardiography obtained in the supine position did not reveal any right-to-left shunt.

Video 3. Contrast transesophageal echocardiography obtained in the sitting position shows the patent foramen ovale slit, which widened to 7 mm, and right-to-left multiple contrast transition.

Video 4. Contrast transesophageal echocardiography obtained in the sitting position shows the patent foramen ovale slit, which widened to 7 mm, and right-to-left multiple contrast transition.

Video 5. Transthoracic echocardiography with contrast injection did not reveal right-to-left shunting in sitting position, and the PFO occluder device (arrow) is shown in the interatrial septum.

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Multilobulated aneurysm of the sinuses of Valsalva demonstrated using multimodality imaging methods

A 45-year-old male was admitted to our emergency department with progressive dyspnea on exertion. Transthoracic echocardiography (TTE) showed aneurysm of the aortic sinuses of Valsalva, severe aortic regurgitation with elongated annulus, ejection fraction of 50%, and left ventricular dilatation. Transesophageal echocardiography (TEE) revealed a 54×28-mm aneurysm with a neck of 18 mm, originating from the right and left coronary sinus of Valsalva (Fig. 1, Video 1, 2). Coronary angiography revealed significant stenosis of the left and right coronary artery. Computed tomography (CT) scan confirmed TEE findings. Multilobulated aneurysm with a size of 54×59×28 mm at the level of the right and left sinuses of Valsalva, originating from right sinus, was identified (Fig. 2a, 2b). An emergent operation was performed (Fig. 2c). A pseudoaneurysm that had formed between the right and left coronary sinuses of Valsalva was excised and repaired using sutures with pledgets. The Bentall procedure was performed. The left internal mammary artery was anastomosed to the left anterior descending artery, whereas the saphenous graft was anastomosed to the right coronary artery. Histopathological examination of the aneurysmal tissue confirmed a congenital etiology, with a deficiency of elastic fibers and hyaline deposits. The aortic tissue was fragile and adhesive, and the patient expired on the day of operation. Regardless of a congenital or acquired etiology, aneurysm of the sinuses of Valsalva is a rare disease that frequently originates from the right sinus of

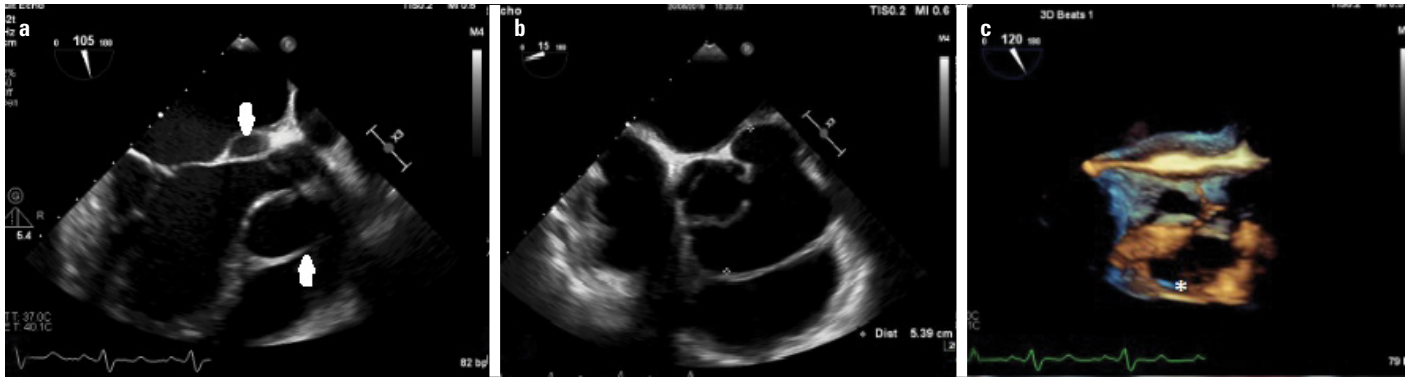

Figure 1. (a, b, c) Transesophageal echocardiography; a) Two-dimensional mid-esophageal long-axis view shows aortic aneurysm at the level of the left and right coronary sinuses (arrow); (b) The short axis view of the aortic valve at the mid-esophageal level shows the large aneurysm surrounding the left and right coronary sinuses; (c) Three-dimensional transesophageal echocardiographic view shows the aneurysm of the right coronary sinus of Valsalva (asterisk)

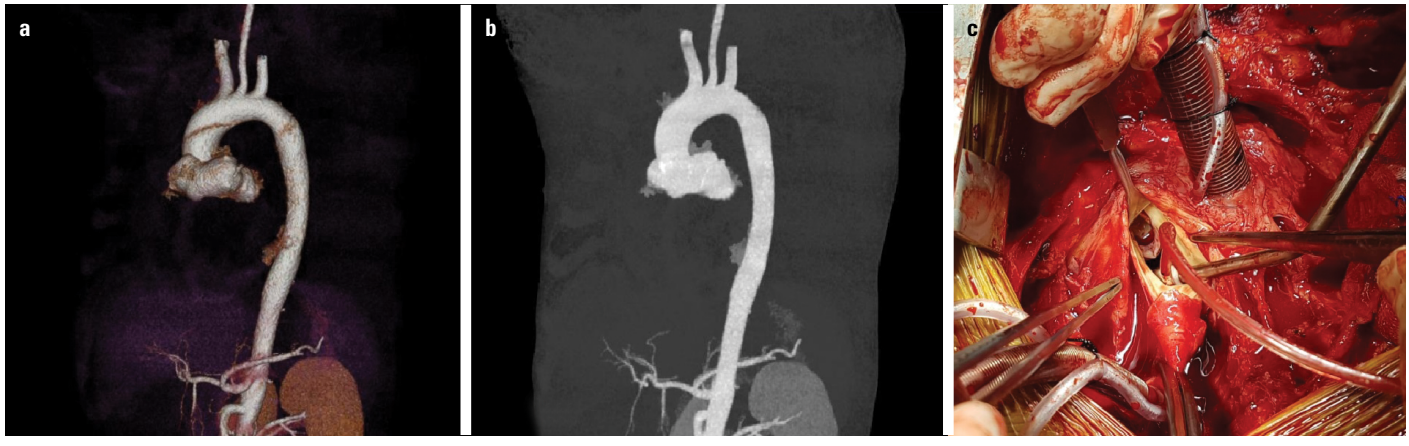

Figure 2. (a) Three-dimensional CT shows the aneurysm of the right coronary sinus of Valsalva extending to left lateral side; (b) Reconstituted image of the contrast enhanced computed tomography is shown; (c) Intraoperative view shows the orifice of the aneurysm of the sinus of Valsalva