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Changes of atrial septum defect caused by posture during three-dimensional transesophageal echocardiography (a case of Platypnea-orthodeoxia syndrome)

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Background: Platypnea-Orthodeoxia syndrome (POS) is a rare phenomenon which is characterized postural hypoxia due to the intracardiac shunt from right to left through a patent foramen ovale, an atrial septal defect or a pulmonary arteriovenous malformation. POS is often underestimated because the hypoxia by postural change is difficult to be detected. We evaluated three-dimensional transesophageal echocardiography (TEE) to diagnose POS in an elderly patient.

Case report: A 84-year-old woman suffered from repetitive syncope for several years. She undertook twelve leads electrocardiogram (ECG), screening transthoracic echocardiography (TTE), twenty-four hours ECG and treadmill stress ECG, however, the cause of syncope was not identified. After another syncope event happened, she was transferred to the emergency room. Then, the hypoxia caused by sitting position was pointed out for the first time.

Her hypoxia was improved by supine position and oxygen administration. TTE demonstrated no right heart enlargement. Shunt flow was suspected on her atrial septum; however, it was difficult to reveal it by TTE because of her obesity. Therefore, she underwent intravenous saline injection test. In the decubitus position, an intravenous injection of saline under Valsalva maneuver revealed the shunt flow from the right atrium to the left atrium. Her arterial oxygen saturation (SpO₂) was 95%. In the sitting position, a visible shunt flow was observed, then her SpO₂ dropped to 85%. By TEE, the shunt hole was found in the oval fossa of the atrial septum. TEE was evaluated by different positions. The atrial defect hole became larger in the sitting position (area 1.05cm²) than in the supine position (area 0.43cm²). As a result, the postural change to sitting revealed Platypnea-Orthodeoxia syndrome associated with ASD. The pulmonary blood flow/systemic blood flow ratio (Qp/Qs) was estimated at 1.6. After surgical ASD closure, she was discharged without any symptoms.

Conclusion: Unclearness of TTE and the absence of a right heart overload may lead to misdiagnosis of POS. If a syncope patient caused hypoxia in the only sitting position, detailed echocardiography should be needed to rule out a diagnosis of POS. This is considerably valuable case of three-dimensional TEE confirmed the changes of ASD size by postural change.

Abstract P248 Figure.

