

Acute refractory hypoxemia due to right to left shunting via atrial septal defect

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Introduction: Atrial septal defect (ASD) is a common congenital defect and is mostly asymptomatic in adults. Hypoxemia in ASD is caused by right-to-left shunt (RLS), which can manifest as Eisenmenger syndrome characterized by severe irreversible pulmonary hypertension. However, acute elevation of pulmonary arterial pressure could make RLS via ASD or patent foramen ovale. Here we report a patient who underwent invasive mechanical ventilator care for refractory hypoxemia due to acute development of RLS via ASD.

Case: A 58-year-old woman with a history of surgical correction of Tetralogy of Fallot was admitted for planned chemotherapy for gallbladder cancer. Baseline transthoracic echocardiography (TTE) was performed prior to chemotherapy. The TTE showed right ventricular enlargement and mild pulmonary stenosis. However, shunt flow was not seen. On the fourth hospital day, fever followed by tachycardia, transient hypotension and hypoxemia were developed. Hydration, intravenous antibiotics, and oxygen via nasal cannula were immediately delivered. On the eleventh day, she complained of severe dyspnea. The oxygen saturation rapidly reduced to 85% that was not fully compensated even applying high flow nasal cannula therapy and invasive mechanical ventilation. To uncover uncorrected hypoxemia and rule out pulmonary thromboembolism, TTE and chest enhanced computed tomography were performed, and there was no definite cause of hypoxemia. The agitated saline test was performed using TTE, and large amount of RLS was found. On transesophageal echocardiogram, ASD with RLS was confirmed (Fig. 1). The acutely developed pulmonary hypertension after hydration for fever and transient shock led to RLS via ASD, and the shunt caused refractory hypoxemia. To compensate increased pulmonary vascular pressure, massive diuretic therapy was started. She continued to improve clinically, and mechanical ventilation was successfully weaned off in two days.

Conclusion: Acute developed RLS should be considered in refractory hypoxemia, and early echocardiography with agitated saline test is clinically useful.

