Right ventricular diastolic dysfunction and patent foramen ovale causing profound cyanosis

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A 73 year old woman presented with profound central cyanosis and a history of a minor stroke. She had normal heart morphology, normal pulmonary artery pressure, and a normal coronary angiography. A patent foramen ovale (PFO) with a massive right to left shunt was demonstrated at the atrial level, with normal pulmonary venous saturations and PO₂ values. This rare, age related case of right ventricular diastolic dysfunction in a normotensive patient revealed a generous PFO allowing a pronounced right to left shunt.

This rare, age related case of RV diastolic dysfunction in a normotensive patient revealed a generous PFO allowing a pronounced right to left shunt.

DISCUSSION

A persistent right to left shunt at the atrial level across a PFO has previously been described in relation to RV dysfunction or elevation of the pulmonary pressure in conditions such as chronic obstructive pulmonary disease, or pulmonary, recurrent pulmonary embolism, tricuspid valve dysfunction, RV infarction, and right sided myxoma.1 A significant right to left shunt via PFO has rarely been described without underlying cardiac or pulmonary disease.2–4 Several theoretical pathophysiological explanations were offered to explain such a phenomenon. Preferential streaming of the blood from the inferior vena cava across the PFO and transatrial septal pressure gradients were suggested as the likely cause for the haemodynamic state.

This is a case report of a 73 year old woman who presented with profound central cyanosis and a history of a minor stroke. She had normal heart morphology, normal pulmonary artery pressure and a normal coronary angiography. A massive right to left shunt was demonstrated at atrial level with normal pulmonary venous saturations and PO₂ values. The reason for this huge right to left shunt at the PFO level is illustrated by the diastolic pressure curves representing compliance differences between right and left ventricles (fig 1). This is probably an age related phenomenon in the presence of normal LV compliance and function of this normotensive woman. Age related reduction of ventricular compliance is a frequently described finding. This is a rare case in which this age related phenomenon affected mostly the right ventricle, and in the presence of a large PFO allowed this pronounced right to left flow at the atrial level with profound cyanosis. The patient’s oxygenation improved dramatically following the transient balloon occlusion of the defect. Testing the tolerance of this procedure and measuring the defect size (22 mm) was followed by transcatheter PFO closure by a 24 mm Amplatzer ASD occluder. Physical rehabilitation to normal function followed.

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Abbreviations: ASD, atrial septal defect; LV, left ventricular; PFO, patent foramen ovale; RV, right ventricular
REFERENCES


