North-south syndrome in veno-arterial extra-corporeal membrane oxygenator: the other Harlequin syndrome

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A 66-yr-old man underwent femoral veno-arterial extracorporeal membrane oxygenation (ECMO) to treat cardiogenic shock following myocardial infarction. Computed tomography (CT) angiography (Figure) revealed native cardiac flow competing with flow generated by the ECMO circuit, resulting in an interface of native cardiac/ECMO flow at the level of the renal arteries. The opacified blood (as shown by radiographic contrast) that had been injected into a right arm vein was pumped from the native heart through the thoracic aorta. The distal aorta was not radiographically opacified as it was perfused by the competing, non-opacified, ECMO flow. With peripherally inserted veno-arterial ECMO, blood is drawn from the inferior vena cava and then

pumped into the distal abdominal aorta through a femoral arterial cannula.

In cases where there is poor pulmonary function, poorly oxygenated blood ejected from the heart puts patients at risk of myocardial or cerebral hypoxemia if ventilator settings cannot be optimized to achieve adequate oxygen saturation in the proximal aortic tributaries. This phenomenon of unequal oxygenation between the upper and lower body is known as north-south syndrome,¹ a form of Harlequin syndrome (not related to the hemifacial autonomic dysfunction of a similar name). The patient's

Figure Curved planar reformatted thoraco-abdominal aortic computed tomography angiography showing native, radiographically opacified antegrade cardiac blood flow competing with non-opacified retrograde blood flow generated by the extracorporeal membrane oxygenator (ECMO) circuit. IVC = inferior vena cava

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pulmonary and cardiac function slowly improved, and the patient was weaned from ECMO after five days. The patient was discharged home 60 days after his initial presentation.

Conflicts of interest None declared.

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