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Extracorporeal Membranous Oxygenation Mimics Aortic Dissection on CAT Scan.

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A 66 year-old female presented with refractory acute congestive heart failure, cardiogenic shock, and ventricular tachyarrhythmia. Veno-arterial extracorporeal membrane oxygenation (ECMO) was placed via femoral cannulation for salvage and stabilized. CAT scan of the chest performed as a part of heart transplant work-up, demonstrated an unequal distribution of intravenous contrast in the aortic arch (Figure 1). Radiologist's preliminary reading was of "aortic dissection" while in fact this is truly "normal ECMO flow".

During venoarterial ECMO, there is a constant competitive flow between the native cardiac output of the patient and the retrogradely perfusing flow from the arterial femoral cannula of ECMO. As a result, mixing of these two flows will occur at differing points in the aorta dependent on which output is higher. If the ECMO flow is exceeding the native heart function, the mixing will occur in the ascending aorta (Figure 2 left). Conversely, in a state of high cardiac output, mixing transpires in the descending aorta (Figure 2 middle). The CAT scan of this patient clearly demonstrated mixing within the aortic arch (Figure 2 right). In this setting, the intravenous contrast was injected into the right atrium through a central line, whose tip was in close proximity to the venous cannula of the ECMO system. The contrast quickly entered the ECMO circuit and flowed through the femoral arterial cannula up the descending aorta retrograde. Meanwhile, the native heart attempted to eject contrast to the ascending aorta but was unable to due to its poor function and decreased flows compared to ECMO. Upon further discussion with the radiologist, the final diagnosis was normal aorta with altered physiology from femorally inserted ECMO.

Figure 1



Figure 2

