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Rapidly Enlarging Pulmonary Artery Aneurysm: An Unusual Complication due to Prolonged Mechanical Cardio-Respiratory Support in COVID-19

To the Editor

A 22-year-old postpartum woman was admitted to our tertiary care center with acute respiratory distress syndrome (ARDS) secondary to COVID-19 infection (Figure 1A). She remained severely hypoxemic on mechanical ventilation despite prone positioning and steroid therapy. Our multidisciplinary committee decided to trial mechanical cardio-respiratory support, utilizing a TandemLife Protek Duo™ (TPD; TandemLife, Pittsburgh, PA) right ventricular assist device with oxygenator (Oxy-RVAD). It resulted in a short-term improvement in hypoxemia. However, shortly after return to the intensive care unit, the patient suffered a cardiac arrest; a bedside transthoracic echocardiogram (TTE) showed severely reduced right- (RV) and left ventricle (LV) function. She was emergently cannulated for veno-arterial extracorporeal membrane oxygenation (VA-ECMO). An Impella™ (Abiomed, Danvers, MA) LV assist device was also placed to unload the ‘trapped’ LV (Figure 1B). A repeat TTE revealed improved LV function and an ejection fraction (EF) of 45% on hospital day 14. She was downgraded from VA-ECMO and Impella support to Oxy-RVAD. On hospital day 40, another TTE noted complete LV and RV function recovery, and the

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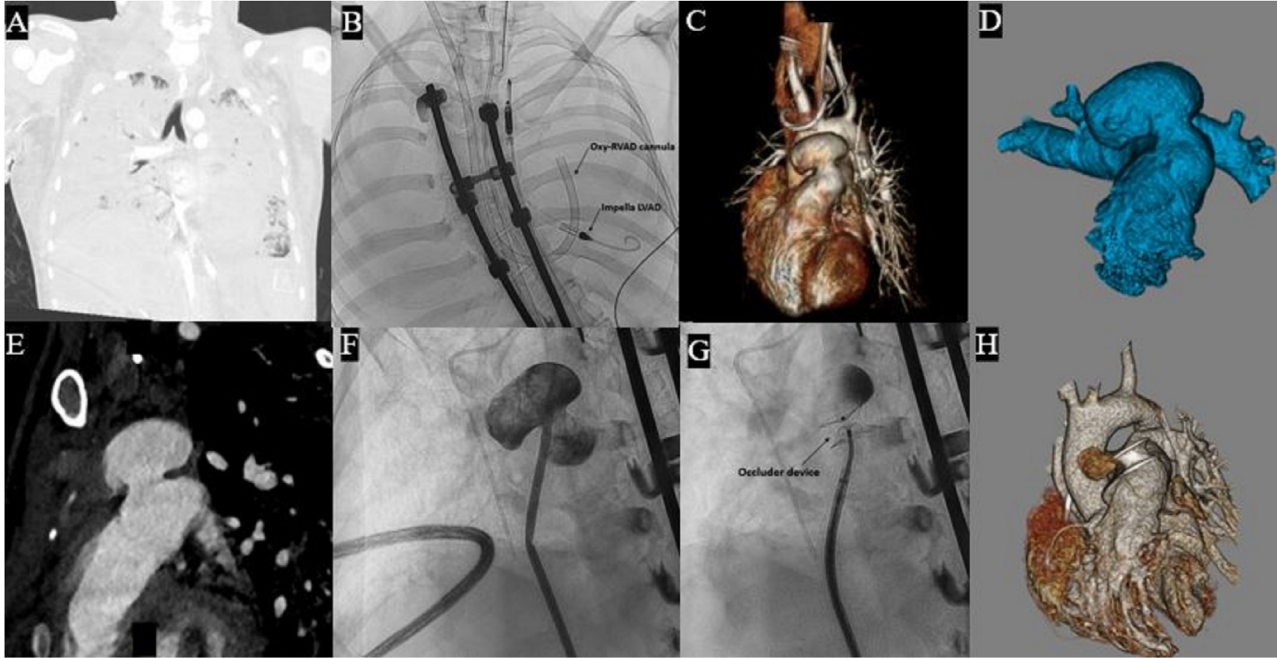


FIG 1. Rapidly enlarging pulmonary artery aneurysm and closure in a COVID-19 patient on cardio-respiratory support. (A) CT chest with COVID-19 ARDS, (B) Oxy-RVAD cannula in the main pulmonary artery and Impella LVAD in the left ventricle, (C and D) 3-dimensional reconstructed images showing the PA aneurysm, (E) CT slice showing PA aneurysm, (F) Angiogram with PA aneurysm pre-, (G) post-closure, (H) 3-dimensional reconstructed image showing minimal filling of closed PA aneurysm. CT, Computed Tomography; COVID-19, Coronavirus disease 2019; RVAD, Right Ventricular Assist Device; LVAD, Left Ventricular Assist Device; PA, Pulmonary Artery; LV, Left Ventricle.

patient was transitioned to standard veno-venous (VV)- ECMO for mobility and strength recovery.

ECMO was capped on hospital day 117 for 36 hours and liberated on hospital day 121. On hospital day 140, a follow-up computed tomography (CT) chest to assess pulmonary injury incidentally noted a large main pulmonary artery (PA) aneurysm (maximum diameter of 3.5 cm) which continued to enlarge on a repeat CT 48 hours later (Figure 1C, 1D and 1E).

Percutaneous closure of the PA aneurysm was pursued due to concerns of imminent rupture. CT-guided precise location and dimension of the PA aneurysm were assessed, and the patient underwent an uneventful closure with a 12 mm Amplatzer muscular ventricular septal defect closure device (AGA Medical Corp.) (Figure 1F). Follow up angiography revealed exclusion of the pseudoaneurysm (Figure 1G) which was confirmed with a repeat CT scan 1 week later (Figure 1H). Currently the patient is awaiting lung transplantation.

We describe the development of pulmonary artery injury and resultant aneurysm secondary to prolonged Oxy-RVAD support in a patient with COVID-19. Mechanical cardio-respiratory support utilization has increased substantially during the COVID-19 pandemic.¹ Vascular complications are common, and the major cause of mortality, in ECMO patients. Health-care providers should be aware of this rare but important complication due to prolonged Oxy-RVAD support.

REFERENCE

1. Shekar K, Badulak J, Peek G, et al. Extracorporeal life support organization coronavirus disease 2019 interim guidelines: A consensus document from an international group of interdisciplinary extracorporeal membrane oxygenation providers. *ASAIO J* 2020;66:707–21. <https://doi.org/10.1097/MAT.0000000000001193>. PMID: 32604322; PMCID: PMC7228451 ELSO Guideline Working Group.

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