

Clinical-Medical Image

Mechanical Thrombectomy: Paradigm Shift in Treatment for Pulmonary Embolism

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Figure 1: Inflammation of panniculitis.

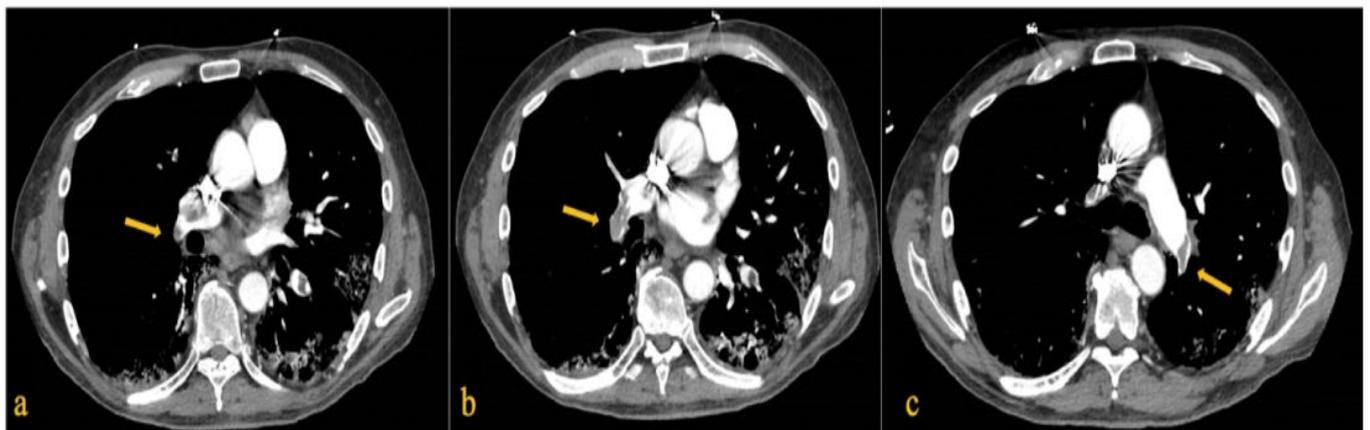


Figure 2: Chest computed tomography shows pulmonary emboli in the right pulmonary artery (a and b) and left pulmonary artery (c) with significant clot burden.

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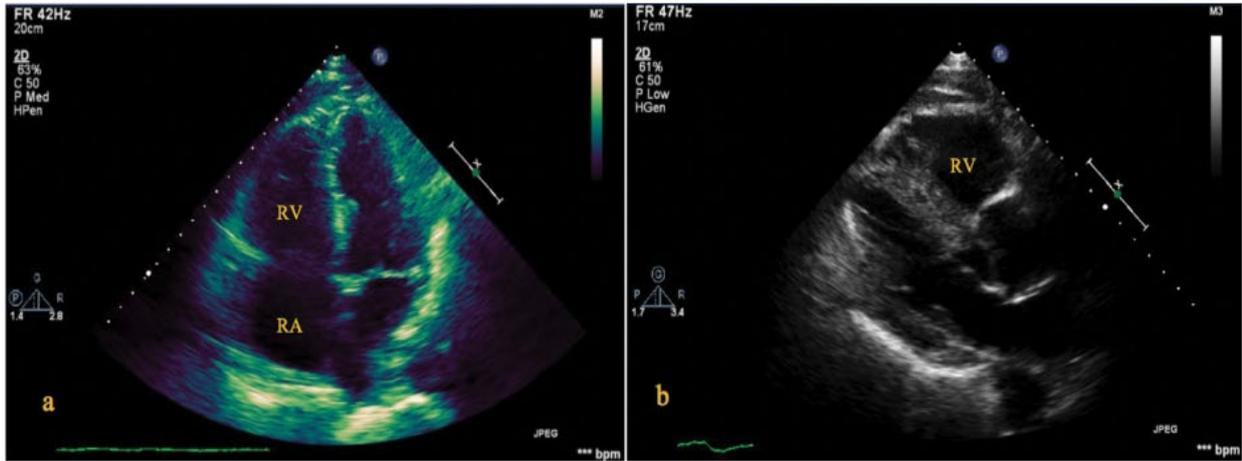


Figure 3: Echocardiogram showed an estimated ejection fraction of 55% with dilated inferior vena cava, (a) Right Atrium (RA), and (b) Right Ventricle (RV).

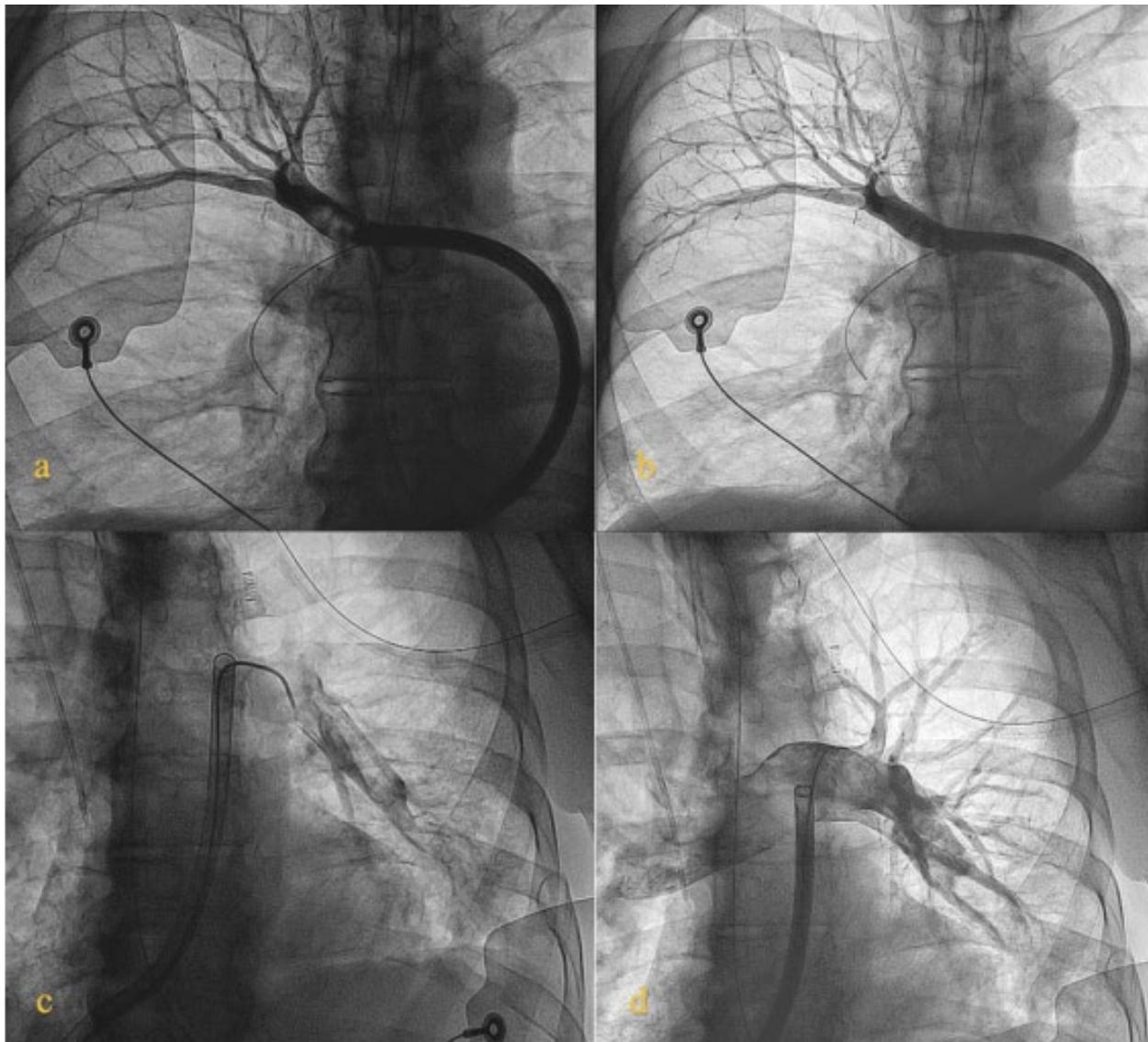


Figure 4: Right heart catheterization showed peak pulmonary artery pressure of 45 mmHg with mean of 30 mmHg. (a) Shows a heavy clot burden in the right pulmonary artery and truncus anterior, (b) shows clot resolution with adequate perfusion post mechanical thrombectomy, (c) shows a large clot in the descending branch of the left pulmonary artery and (d) shows clot resolution with adequate perfusion post mechanical thrombectomy in the left pulmonary artery.



Figure 5: Large clots removed from both the left and right pulmonary arteries are shown. The syringe is placed for size comparison.

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A 65-year-old man presented with syncope and dyspnoea secondary to COVID-19 infection. He developed acute respiratory distress syndrome with subsequent bilateral pulmonary emboli despite intravenous heparin therapy on admission. Chest computed tomography revealed large bilateral acute pulmonary emboli with right ventricular strain. Echocardiogram showed an estimated ejection fraction of 55% with dilated inferior vena cava, right atrium, and right ventricle. The patient's oxygen requirements continued to increase necessitating endotracheal intubation and mechanical ventilation. On ventilation he required a tidal volume of 340, respiratory rate of 28, PEEP of 14, and FiO₂ of 100%. The patient was hemodynamically unstable with increasing oxygen demand in the setting of massive pulmonary embolism with right ventricular strain, so mechanical thrombectomy was performed. Right heart catheterization showed peak pulmonary artery pressure of 45mmHg with mean of 30 mmHg. Significant amount of clot burden was removed from the right upper and middle lobes as well as the left middle lobe using INARI 24 Flow Triever. Post-injection revealed good perfusion in all the lung lobes. Following clot removal the mean pulmonary artery pressure dropped by >10 mmHg and the FiO₂ reduced to 70%.

Mechanical thrombectomy has been shown to reduce pulmonary artery pressure by a mean of 8 mmHg. This method has a lower risk of bleeding at 6.7%, and a 30-day mortality benefit of 8.0% [1]. This vignette presents images of a mechanical thrombectomy as the first line treatment modality for pulmonary embolism in the setting of acute respiratory failure with hemodynamic instability due to SARS-CoV-2 (Figures 1-5).

Keywords: Pulmonary embolism; Mechanical thrombectomy; COVID-19

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Reference

[1] Patel NJ, Atti V, Basir MB, and Aggarwal V (2019) Catheter based therapies in massive pulmonary embolism. *Int J Cardiol* 287: 116-117.