Covid vaccine causing life threatening Right ventricle thrombus from breakthrough covid infection

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Supplemental Video

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Background: Thrombogenesis related to use of vaccines to prevent COVID-19 infection has become more recognized, evidenced by increased emergence of documented coagulopathy following the COVID-19 vaccine administration.

The intra-cardiac development of thrombi itself remains a rare phenomenon in literature, especially in association with breakthrough covid case.
We present a patient who was found to have sudden right ventricle failure secondary to moderate thrombus in the right ventricle, 3 weeks after receiving the first dose of COVID vaccine.

Case Presentation: A 58-year-old male with hypertension, hyperlipidemia, was transferred from another facility, post cardiac arrest. Patient had been complaining of shortness of breath from past few days, but when it suddenly got worse, EMS was called and his oxygen saturation was found to be 70%. He was already intubated upon admission.

He had received his first dose of Pfizer vaccine 3 weeks prior.

His temperature was 91.4, HR of 101, RR 28, BP of 87/61, pH was 6.98/81.1/51/19, 100% of FiO2 on Ventilator.

Pertinent labs included WBC- 34, Bicarbonate - 16, BUN/Cr - 27/2.4, total bilirubin - 2.30, AST -1149. ALT 685, Troponin - 0.605 ng/ml, lactate - 8.8, d-dimer > 35.20 mg/L, Covid PCR was positive.

EKG showed sinus tachycardia with frequent PVCs and PACs. CXR showed multifocal pneumonia.
CTA showed small hypo densities associated with left upper lobe and right lower lobe pulmonary arteries which may reflect small nonocclusive emboli versus artifact, multifocal bilateral ground glass.

He was managed with Iv fluid resuscitation, full dose anticoagulation, antibiotics, steroids and pressor support.

Additionally, TTE was obtained which showed EF of 60-65% without regional wall motion abnormalities, severely dilated and severely hypokinetic right ventricle with moderate sized mobile echo density within RV cavity consistent with thrombus.

Final Diagnosis and outcome: Patient was diagnosed with RV thrombus from covid vaccine/pneumonia and was given systemic tPA, but patient continued to deteriorate requiring maximal pressor support, worsening hypoxia and acidemia, despite all efforts to manipulate ventilator and placing on neuromuscular blockade and prone positioning.

Family then opted for withdrawing care and unfortunately patient expired shortly after extubation.

Learning Objectives
1. Identify that Covid vaccine itself in an otherwise healthy adult can still lead to occurrence of breakthrough Covid infection leading to acute life threatening multi-system thrombotic events, despite breakthrough cases being considered mild/asymptomatic.

2. Identify the factors that may contribute to breakthrough cases such as different SARS CoV-2 variants, increased number of vaccinated persons, and waning immunity. Vaccine breakthrough has been associated with all current authorized vaccines. After receiving a single dose of vaccine, immunity will usually develop after two weeks following vaccination. But in the case presented above, patient was already due his second dose of covid vaccine.

3. Diagnose and treat urgent thrombotic events by ordering imaging studies, such as CTA chest, TTE, CT head/abdomen at a timely manner as it could potentially reduce morbidity and mortality, significantly.

References and Resources
Tajstra M, Jaroszewicz J, Gąsior M. Acute Coronary Tree Thrombosis After Vaccination for COVID-19. JACC Cardiovasc Interv. 2021;14(9):e103-e104. doi:10.1016/j.jcin.2021.03.003

Amir Kaki, Hemindermeet Singh, Gerald Cohen, Theodore Schreiber, A case report of a large intracardiac thrombus in a COVID-19 patient managed with percutaneous thrombectomy and right ventricular mechanical circulatory support, European Heart Journal - Case Reports, Volume 4, Issue 6, December 2020, Pages 1–5, https://doi.org/10.1093/ehjcr/ytaa308

Merlo E, Grutta G, Tiberio I, Martelli G. Right Heart Thrombus in an Adult COVID-19 Patient: A Case Report. J Crit Care Med (Targu Mures). 2020;6(4):237-242. Published 2020 Nov 7. doi:10.2478/jccm-2020-0039

Ayse Sahin Tutak, Fatih Söylemez, Hazal B. Konuk, Erkan Çakmak, Bülent Karakaya, Ali Doğan, Hakan S. Sayiner, Selçuk Aksöz, Mehtap Alev,
A patient presenting with ARDS after COVID-19 vaccination: A COVID-19 case report,
https://doi.org/10.1016/j.jiph.2021.05.017.
(https://www.sciencedirect.com/science/article/pii/S1876034121001532)