

Pneumonic COVIDOMA with Simultaneously Elevated Troponin and D-Dimer in Remarkable Ischemic Heart in a Young Female-Interpretation and Prognostic Value

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Abstract

Rationale: COVID-19 virus is a still worldwide infectious disease with a subsequent severe acute respiratory syndrome (SARS). A cardiovascular impact is a considerable major factor in morbidity and mortality in this pandemic. Coronary artery involvement and cardiac injury may be a serious association. Both cardiac troponins I and T are the diagnostic biomarkers for myocardial injury. D-dimer is an estimator of hypercoagulability.

Patient concerns: A 26-year-old, housewife, married, Egyptian female patient was presented to the physician outpatient clinic (POC) with COVID-19 pneumonia and ischemic heart disease.

Diagnosis: Pneumonic COVIDOMA with remarkable ischemic injury in a young female patient.

Interventions: Chest CT, electrocardiography, and oxygenation.

Outcomes: Dramatic response and Good outcomes in the presence of remarkably serious risk factors were the results.

Lessons: Female sex with ischemic heart disease, elevated troponin, and elevated D-dimer are constellation risk factors for serious COVID-19 pneumonia. The association of COVID pneumonia with ischemic heart disease is highly interesting in case management. COVIDOMA is a new description for a mass-like pneumonic consolidation in COVID-19 infection.

Keywords: COVID-19 pneumonia, Ischemic heart disease, Troponin, D-dimer

Abbreviations

COVID-19: Coronavirus disease 2019

ECG: Electrocardiogram

ICU: Intensive care unit

IHD: Ischemic heart disease

O₂: Oxygen

POC; Physician outpatient clinic

SGOT: Serum glutamic-oxaloacetic transaminase

SGPT: Serum glutamic-pyruvic transaminase

VR: Ventricular rate

Introduction

COVID-19 virus is still a worldwide infectious disease and continues to expand.

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) and COVID-19 pneumonia were initially discovered in Wuhan, China, and rapidly spread

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throughout the world¹. Several probable mechanisms have been embroiled in cardiac damage during the COVID-19 pandemic. The systemic inflammatory response in severe COVID-19 infection is a result of high cytokines causing cytokine-release syndrome that can be causing multiple tissue injuries, involving both vascular endothelium and cardiac myocytes². Plaque rupture causes **acute ischemic events** due to systemic inflammation and catecholamine surge in this disease^{3,4}. Coronary artery thrombosis has been reported probable cause of an acute ischemic cardiac event in COVID-19 patients⁵. Both **cardiac troponins** I and T are the diagnostic biomarkers for myocardial injury. However, cTnI is one of the most sensitive and specific biomarkers in myocardial injury. It shows a higher specificity than the creatine kinase-MB (CK-MB) and greater sensitivity and specificity than cTnT⁶. The **plasma D-dimer** level rises in both thrombosis and degradation of fibrin. So, plasma D-dimer is a biological marker of hemostatic disorders and thromboembolism⁷. D-dimers are associated with coronary artery disease severity⁸. D-dimer is an estimator of hypercoagulability. There is a correlation with the severity of acute coronary syndromes⁹.

Case Presentation

A 26-year-old, housewife, married, Egyptian female patient was presented to the physician outpatient clinic (POC) with a fever. Generalized body aches, tachypnea, chest pain fatigue, anorexia, and loss of smell were associated symptoms. The chest pain is angina. The patient started to complain of fever 6 days ago. She has direct contact with a confirmed case of COVID-19 pneumonia 2 weeks ago. The patient denied a history of other relevant diseases, drugs, or other special habits. Informed consent was taken. Upon general physical examination; generally, the patient appeared irritable, tachypneic, and distressed with a regular rapid pulse rate of VR; 120 bpm, blood pressure (BP) of 90/70 mmHg, respiratory rate of 22 bpm, a temperature of 39 °C, and pulse oximeter of oxygen (O₂) saturation of 91%. The patient

was advised to refer to the intensive care unit (ICU) but she rejects it. Currently, the patient was managed at home for COVID pneumonia with extensive ischemic heart disease (IHD). Initially, the patient was treated with O₂ inhalation by O₂ cylinder (100%, by nasal cannula, 5L/min; as needed). IVB of normal saline (0.9 % 500 ml over 30 minutes) and Ringer solution (500 ml over 30 minutes) were given. The patient was maintained treated with cefotaxime; (1000 mg IV TDS), azithromycin tablets (500 mg, OD), oseltamivir capsules (75 mg, BID only for 5 days), and paracetamol (500 mg IV TDS as needed). SC enoxaparin 80 mg, BID), aspirin tablet (75 mg, OD), clopidogrel tablets (75 mg, OD), and hydrocortisone sodium succinate (100 mg IV BID). The patient was daily monitored for temperature, pulse, blood pressure, ECG, and O₂ saturation. The initial ECG tracing was done on the day of the presentation to the POC showing sinus tachycardia of VR; 119. There is extensive anterior (I, aVL, and V2-6 leads) and inferior (II and aVF) horizontal ST-segment depression. There is ST-segment elevation in aVR and V6 leads (Figure 1). The initial chest CT without contrast was done on the day of the presentation to the POC showing large right lower lobe triangular pleural-based ground-glass opacity with intervening air bronchogram and other small ground-glass opacities. There is also a halo sign, a reversal halo sign, and a small left basal pneumatocele left side cardiac rim (Figure 2). The initial complete blood count (CBC); Hb was 11 g/dl, RBCs; 4.1*10³/mm³, WBCs; 3*10³/mm³ (Neutrophils; 76 %, Lymphocytes: 20%, Monocytes; 2%, Eosinophils; 2% and Basophils 0%), and Platelets; 140*10³/mm³. S. ferritin was normal (185 ng/ml). D-dimer was high (890 ng/ml). CRP was high (55.5g/dl). LDH was high (626/L). SGPT was normal (25U/L), SGOT was normal (22U/L). Serum creatinine was normal (0.9mg/dl). RBS was high (220 mg/dl). The troponin-I test was positive (9.9U/L). Pneumonic COVIDOMA with remarkable ischemic injury in a young female patient was the most probable diagnosis. The patient was relieved within 3 weeks of management with modifications and cession in some above medications.

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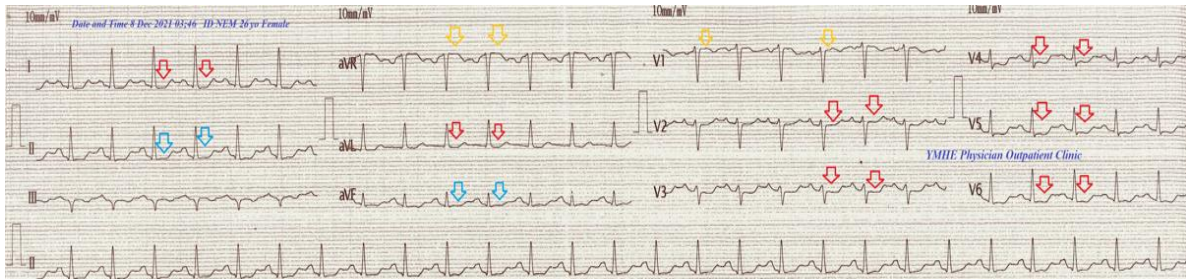


Figure-1: ECG tracing was done on the day of the presentation to the POC showing sinus tachycardia of VR; 119. There is extensive anterior (I, aVL, and V2-6 leads; red arrows) and inferior (II and aVF; light blue arrows) horizontal ST-segment depression. There is ST-segment elevation in aVR and V6 leads (orange arrows).

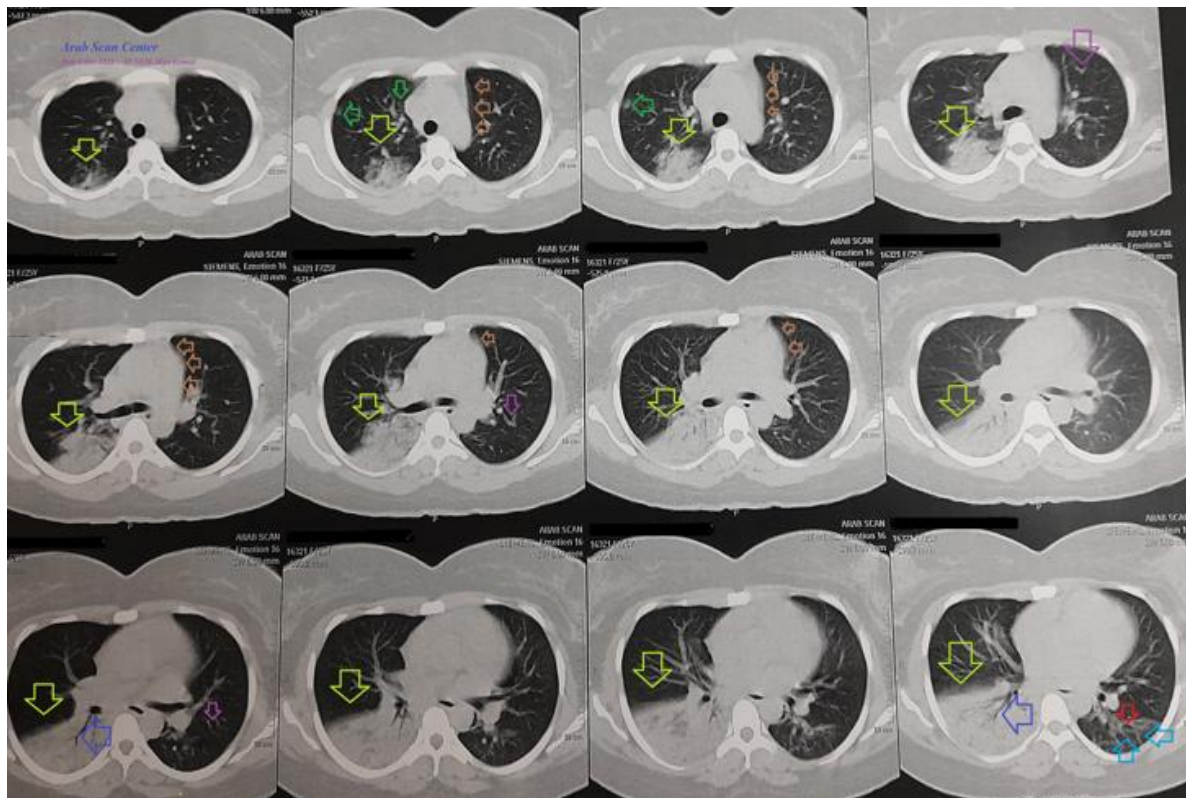


Figure-2: Chest CT without contrast was done on the day of the presentation to the POC showing large right lower lobe triangular pleural-based ground-glass opacity (lime arrows) with intervening air bronchogram (dark blue arrows) and other small ground-glass opacities (green arrows). There is also a halo sign (pink arrows), a reversal halo sign (light blue arrows), a small left basal pneumatocele (red arrows), and left side cardiac rim (brown arrows).

Discussion

Overview

• A 26-year-old, housewife, Egyptian female patient was presented to the POC with COVID-19 pneumonia and ischemic heart disease with simultaneously elevated troponin and d-dimer.

• **The primary objective** for my case study was the presence of COVID-19 pneumonia and ischemic heart disease with simultaneously elevated troponin and d-dimer in POC.

• **The secondary objective** for my case study was the **question**; how would you manage this case in the at home?

• Interestingly, the presence of a positive history of contact with a confirmed COVID-19 case, bilateral ground-glass consolidation, and laboratory COVID-19 suspicion on top of clinical COVID-19 presentation with fever, dry cough, generalized body aches, anorexia, and loss of smell will strengthen the higher suspicion of COVID-19 diagnosis.

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- The elevation in both troponin and d-dimer will be supporting the diagnostic and prognostic value in the current case study.

- The presence of extensive anterior and horizontal ST-segment depression in anterolateral (I, aVL, and V2-6) leads to elevated troponin suggesting the diagnosis of unstable angina.

- But the presence of elevated ST-segment in aVR and V1 leads with elevated d-dimer will be strengthening the suspicion of acute pulmonary embolism.

- Left side cardiac rim in chest CT may indicate COVID-19-associated cardiac injury.

- COVIDOMA is a new description for a mass-like pneumonic consolidation in COVID-19 infection.

- COVID-19-associated mucormycosis was the most probable differential diagnosis for the current case study. But chest CT excludes it.

- I can't **compare** the current case with similar conditions. There are no similar or known cases with the same management for near comparison.

- The only limitation of the current study was the unavailability of echocardiography.

Conclusion and Recommendations

- Female sex with ischemic heart disease, elevated troponin, and elevated D-dimer are constellation risk factors for serious COVID-19. pneumonia.

- The association of COVID pneumonia with ischemic heart disease is highly interesting in case management.

- COVIDOMA is a new description for a mass-like pneumonic consolidation in COVID-19 infection.

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References

[1] Lai CC, Shih TP, Ko WC, Tang HJ, Hsueh PR. Severe acute respiratory syndrome

coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): The epidemic and the challenges. *Int J Antimicrob Agents*. 2020 Mar; 55(3): 105 924. DOI: 10.1016/j.ijantimicag.2020. 105 924. Epub 2020 Feb 17. PMID: 32081636; PMCID: PMC7127800.

[2] Basu-Ray I, Almaddah Nk, Adeboye A, et al. Cardiac Manifestations Of Coronavirus (COVID-19) [Updated 2021 May 19]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK556152/>

[3] Xiong TY, Redwood S, Prendergast B, Chen M. Coronaviruses and the cardiovascular system: acute and long-term implications. *Eur Heart J*. 2020 May 14;41(19):1798-1800. DOI: 10.1093/eurheartj/ehaa231. PMID: 32186331; PMCID: PMC7454513.

[4] Schoenhagen P, Tuzcu EM, Ellis SG. Plaque vulnerability, plaque rupture, and acute coronary syndromes: (multi)-focal manifestation of a systemic disease process. *Circulation*. 2002 Aug 13;106 (7):760-2. DOI: 10.1161/ 01.cir.00000 25708.36290.05. PMID: 12176939.

[5] Dominguez-Erquicia P, Dobarro D, Raposeiras-Roubín S, Bastos-Fernandez G, Iñiguez-Romo A. Multivessel coronary thrombosis in a patient with COVID-19 pneumonia. *Eur Heart J*. 2020 Jun 7;41 (22) :2132. DOI: 10.1093/eurheartj/ ehaa3 93. PMID: 32374373; PMCID: PMC72392 21.

[6] Alirezaei T, Moosavi MJJ, Irilouzadian R, Taziki E. Elevated Cardiac Troponin I following Asymptomatic Intradialytic Hypotension: A Pilot Study with a 2-Year Follow-Up. *International Journal of Clinical Practice*. 2022;1-6. Article ID 4214429. DOI: <https://doi.org/10.1155/2022/4214429>

[7] Yao, T., Tian, BL., Li, G. et al. Elevated plasma D-dimer levels are associated with short-term poor outcome in patients with acute ischemic stroke: a prospective, observational study. *BMC Neurol*. 2019; 19(175):1-8. DOI: <https://doi.org/10.1186/s12883-019-1386-3>

[8] Türkoğlu C, Harbaloğlu H, Şeker T, Baykan AO, Uysal OK. D-dimers are associated with coronary artery disease

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severity assessed using Syntax and Syntax II scores in patients with ST elevation myocardial infarction. *Revista Portuguesa*

de Cardiologia (English Edition). 2020; 39(12):687-93. DOI: 10.1016/j.repce.2020.08.002.

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