



## Unusual presentation of Covid Myopericarditis- a case report

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**Abstract:** - 50 year old woman presented with progressive breathlessness for 5 days. For last 1 day she was severely dyspnoic. We diagnosed this case as a Covid Myo-pericarditis with severe pulmonary hypertension and atrial fibrillation on the basis of pulse 110 bpm, irregularly irregular, BP-90/60 mm of Hg, Lungs- bilateral crepitation, altered with coughing with diminished breath sound, ECG-Atrial fibrillation with fast ventricular rate and echocardiographic findings like severe global hypokinesia with severe LV systolic dysfunction, thickened myocardium and pericardium with severe pulmonary hypertension. Later RT PCR became positive, Troponin I and Pro BNP were raised, HRCT chest reveals mild pulmonary involvement with thickened pericardium and treated accordingly.

**Keywords:** Covid Myopericarditis, chest pain, cardiac, Cardiomegaly, arrhythmias, Covid19.

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## Introduction:

Severe acute respiratory syndrome corona virus 2 (SAR-CoV-2) affected case was first detected in Wuhan, China. Since then we have been facing this pandemic due to this novel Corona virus.<sup>1-4</sup> There is a wide variations of clinical presentation from asymptomatic to critically ill patient. Most pulmonary symptoms are mild and cured without any hospital admission. Elderly and patients with other comorbidities are most vulnerable to get severe symptoms with dyspnea, hypoxia, major lung involvement in High resolution computed tomography (HRCT) chest, respiratory failure, shock and multi organ failure.<sup>5</sup> HRCT chest can help to diagnose the severe respiratory involvement within short period of time where RT-PCR from nasal and oropharyngeal swabs takes few days to give results. Peripheral ground glass appearance and consolidation in lungs are the most common findings observed in covid19 patient. There are fine reticular shadow known as crazy paving pattern also noted.<sup>6,7</sup> Heart involvement in covid 19 patients has been also described in some severe cases.<sup>2,8</sup> Heart assessment cannot be done by HRCT. Echocardiography is the best option to prompt assessment of heart.<sup>9,10</sup>

We describe our case as Covid19 patient with heart involvement.

## Case report:

50 year old woman presented with progressive breathlessness for 5 days. For last 1 day she was severely dyspnoic. She had no history of fever, cough, chest pain or throat pain. She has no history of Bronchial Asthma and atopy. On examination pulse was 110 bpm, irregularly irregular, BP-90/60 mm of Hg, Lungs- bilateral crepitation, altered with coughing with diminished breath sound in lower part. Xray chest P/A view showed Cardiomegaly and bilateral patchy opacity in lower zone (Fig:2). ECG shows Atrial

fibrillation with fast ventricular rate(Fig:1). Echocardiography showed LV global hypokinesia with severe LV (EF: 25-30%) and RV (TAPSE: 7 mm) systolic dysfunction with normal size LV. But LA, RA, RV and MPA were dilated. Myocardium and pericardium were unusually thickened with mild pericardial effusion. Features of severe pulmonary hypertension was also noted (Fig:4,5,6,7,8). Tissue Doppler Imaging (TDI) shows decreased peak of S wave-suggestive of hypokinesia in Fig:9. 2D Global Longitudinal Strain imaging shows: reduced GLS (Average: -5%), Bull's eye was not obtained as AF with fast ventricular rate (Fig: 10). Though she had no fever, prodromal symptoms and already got 3 doses of Covid 19 vaccination, still we had strong suspicion that this might be a case of covid and covid- myocarditis was a possibility. Later Real- time polymerase chain reaction (RT PCR) for covid 19 became positive. Serum CRP and Ferritin were raised but Ddimer was normal. Troponin I was increased (272 ng/ml), Pro BNP was also high about 4200 pg/ml. HRCT chest were done to see the lung involvement. It showed several ground-glass opacities in all lung lobes, consolidation foci, cardiomegaly, thickened pericardium and pericardial effusion, compatible with infectious disease, suggestive of 25% COVID-19 lung involvement (Fig:3). We diagnosed this case as a Covid Myo-pericarditis with severe pulmonary hypertension, Atrial fibrillation and mild lung involvement on the basis of echocardiographic findings, positive RT PCR, raised Troponin I, Pro BNP, HRCT findings and treated accordingly. She was treated with oxygen inhalation and I/V frusemide. This patient was also treated with antibiotics, anti-arrhythmic drug, steroid and prophylactic anticoagulant with continuous cardiac monitoring. She was discharged after improvement of clinical symptoms and progressively normal laboratory findings after 3 weeks (Fig:11).

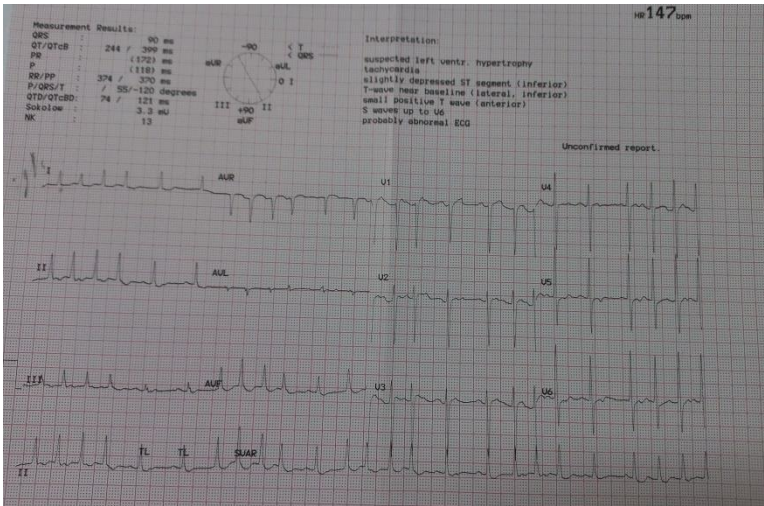


Fig:1 ECG showed Atrial fibrillation with fast ventricular rate.

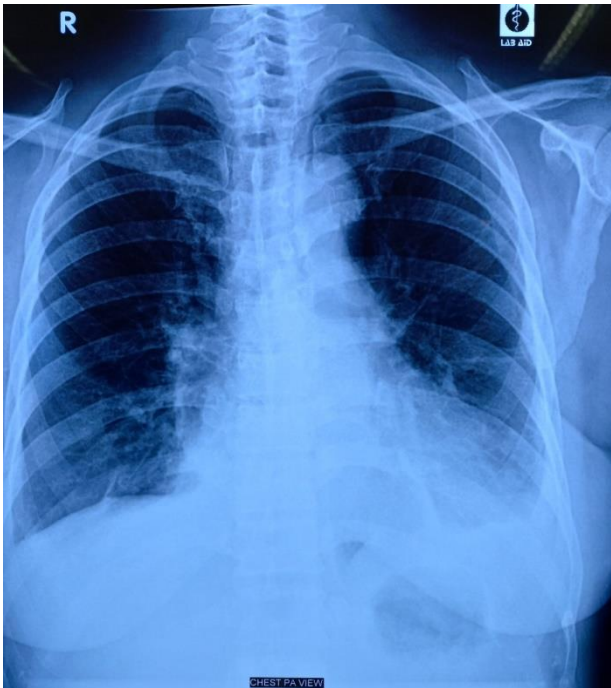
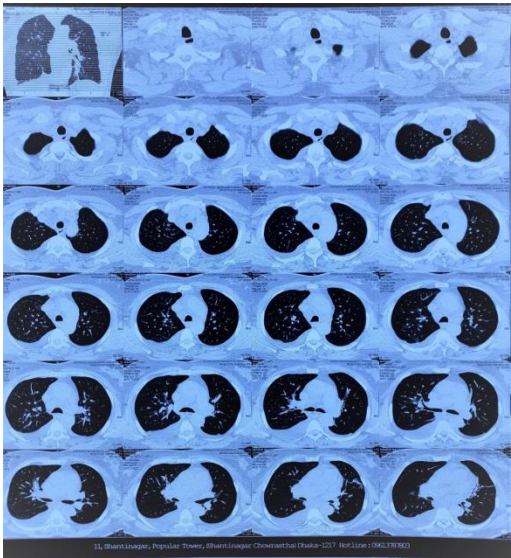


Fig:2 Xray chest P/A view showing Cardiomegali and bilateral patchy opacity in lower zone.



(a)



(b)

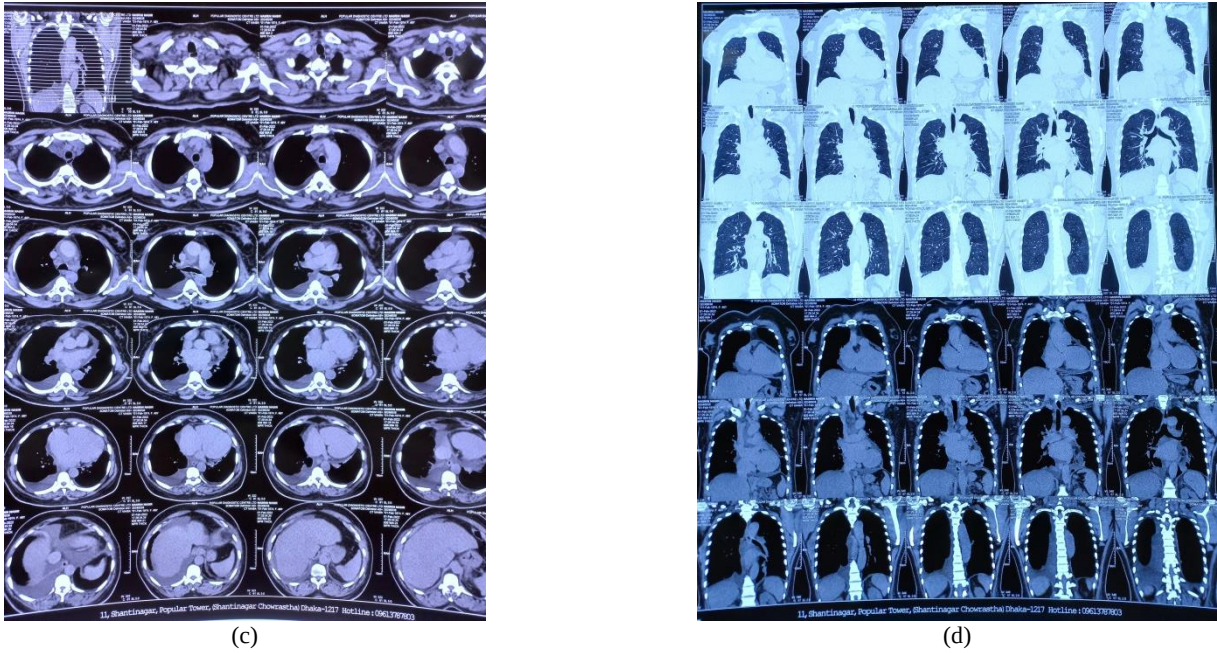


Fig:3 HRCT chest (a) and (b) showing showing several ground-glass opacities and consolidation foci in all pulmonary lobes, compatible with infectious disease, suggestive of COVID-19 lung involvement. (c) and (d) showing Cardiomegaly, thickened pericardium and pericardial effusion.

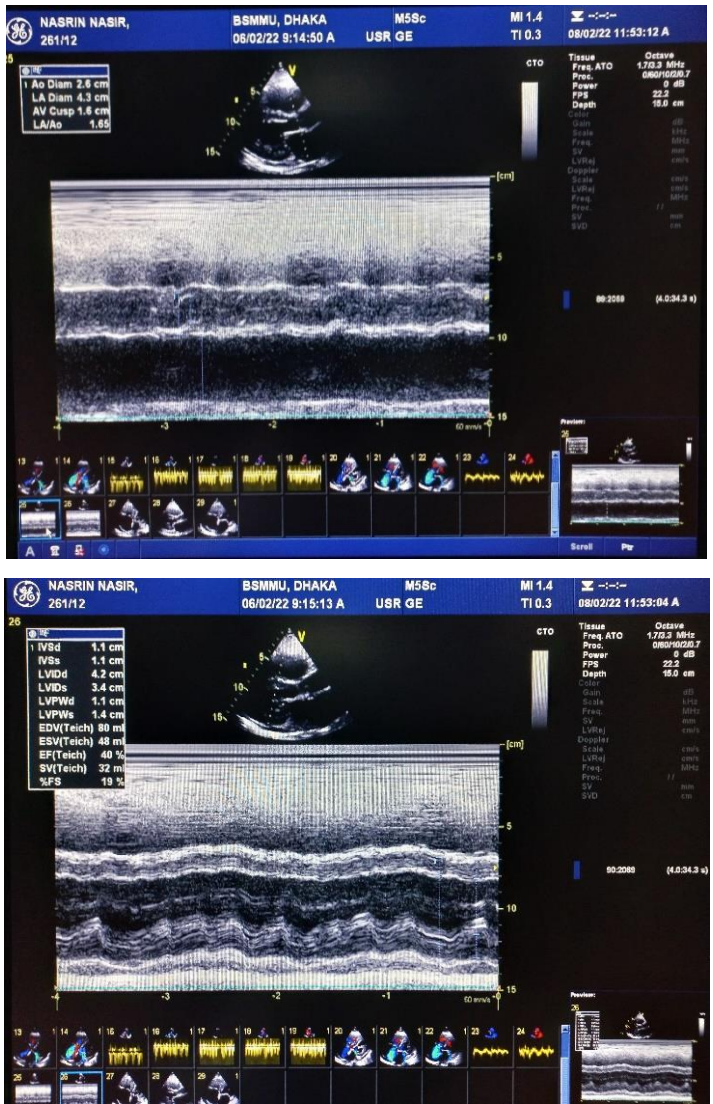


Fig:4 Echo showed global hypokinesia with severe LV systolic dysfunction.



Fig:5 Apical 4 chamber view Echo showed dilated LA, RA, RV.



Fig: 6 Parasternal short axis view at the level of great vessel showed Dilated MPA



Fig:7 Apical 4 chamber view Echo showed Severe TR and Moderate MR.

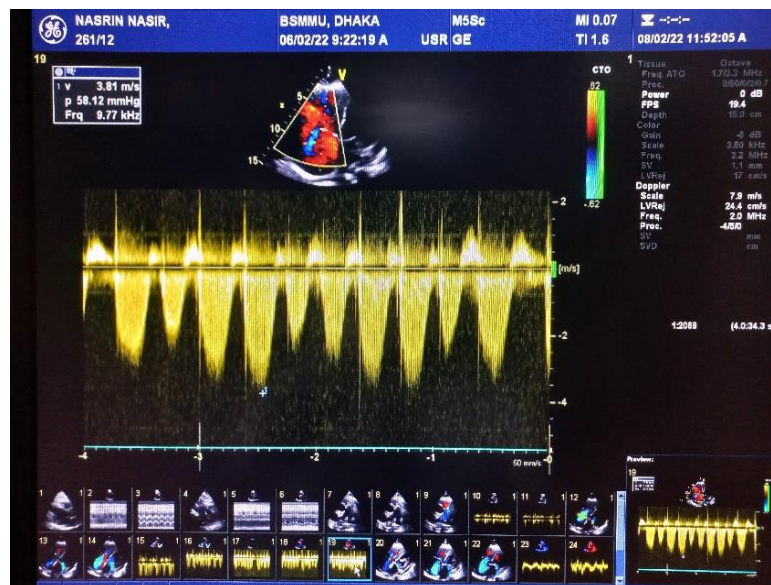


Fig: 8 Severe Tricuspid regurgitation (calculated PASP= 70 mm of Hg)

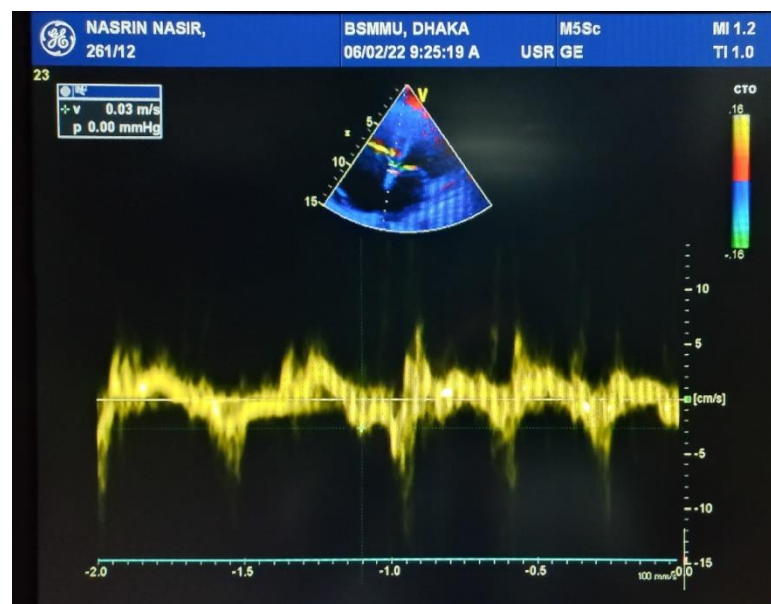
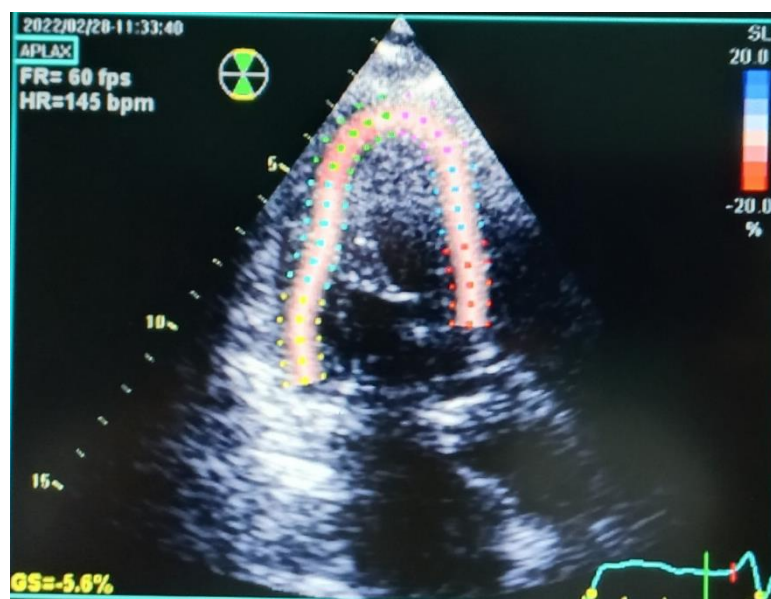


Fig 9: TDI shows decreased peak of S wave-suggestive of hypokinesia



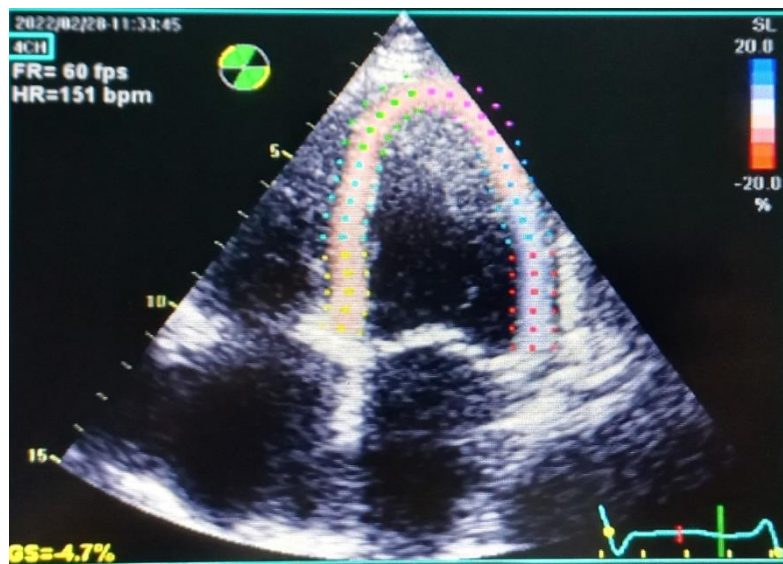


Fig 10: 2D Global Longitudinal Strain imaging shows: reduced GLS (Average: -5%), Bull's eye was not obtained as AF with fast ventricular rate.

## F/U Echo after 3weeks; EF: 45-50%

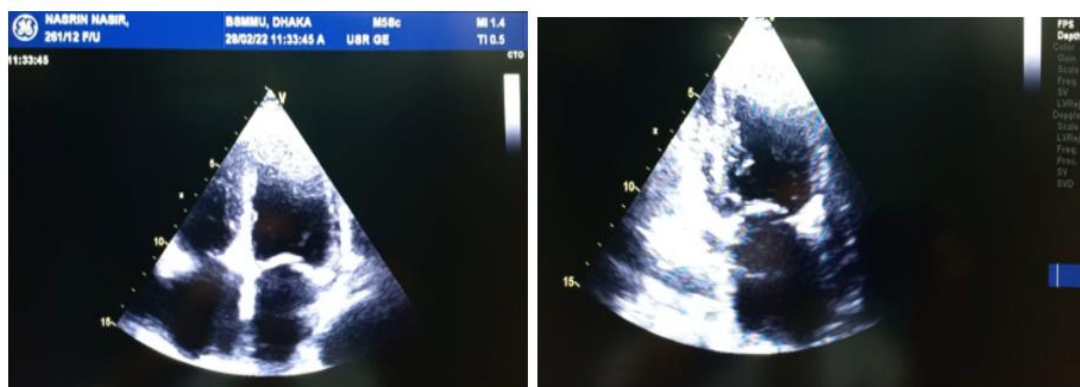


Fig 11: F/U echo shows improvement of global hypokinesia. EF increased (45-50%), Size of RA, RV and LA became reduced.

## Discussion:

COVID-19 cases developed acute myocarditis have been described.<sup>2,8</sup> Heart failure has been documented from myocarditis as complication.<sup>8</sup> The analysis of a large study on Wuhan showed that 44,672 confirmed cases of COVID-19 had showed to have cardiovascular complications, such as myocarditis (10% of cases), myocardial injury (20%), arrhythmias, (16%) and heart failure and shock (5%).<sup>11-13</sup> Our patient had also global hypokinesia with severe LV dysfunction which might be due to myocarditis.

The mechanisms of cardiac involvement observed in COVID-19 are possibly due to direct viral infection to the myocardium or by the indirect toxicity caused by the systemic infection, and can trigger vasculitis or hypersensitivity reaction.<sup>14</sup>

Inciardi et al. reported a patient with COVID-19 and myocarditis diagnosed by CMR, who presented increased troponin I, hypokinetic segmental contractions and left ventricular dysfunction on the echocardiogram. The patient was improved after treatment with inotropic support for one week.<sup>15</sup> Another more severe case

was reported by Hu et al. who described a patient with the diagnosis of a fulminant myocarditis, along with diffuse myocardial edema and marked ventricular dysfunction. The patient received hemodynamic support, steroids and human immunoglobulin, having completely recovered ventricular function and attained normal myocardial lesion markers after 3 weeks.<sup>2</sup> Similar type of Covid 19 Myocarditis patient was reported by Patrícia Yokoo et al.<sup>16</sup> Our patient also have similar pattern of myocardial oedema, her myocardium was unusually thickened which mimics like left ventricular hypertrophy. Despite of she had no history of hypertension and hypertrophic cardiomyopathy, so this thickened myocardium of our patient is due to inflammatory myocarditis. Szekely Y et al. stated in *Circulation* that the most common pathology was RV dilatation and dysfunction observed in 39% of Covid cases. Argulian E et al. published in *JACC: Cardiovascular Imaging* in 2020 a study of 105 COVID hospitalized patients in NY from March 26<sup>th</sup> to April 2<sup>nd</sup> 2020 who had 31% had RV dilatation, 41% died by the end of the study, 11%

died without RV enlargement. Like this study we found RV dilatation in this case.

In the scenario of the SARS-CoV-2 pandemic, it is important to consider the hypothesis of cardiac involvement, mainly in patients with abrupt deterioration of symptoms despite respiratory support measures, those with unexplained increase in myocardial necrosis markers and in patients with a new dysfunction documented by echocardiography. In case of such a possibility, CMR can be used to search for signs compatible with myocarditis, such as the presence of non-ischemic late enhancement pattern. CT-PA is needed to exclude pulmonary embolism in case of pulmonary hypertension.

Our patient also had arrhythmia that is Atrial fibrillation. In suspected arrhythmia and/or myocarditis, lung fields should be carefully assessed, even by CMR, given respiratory asymptomatic or oligo-symptomatic individuals can be infected by the new coronavirus, and suspicion can be considered as of this exam.<sup>10</sup> Md Abu Salim et al. mentioned all the different arrhythmias in Covid 19 patients. Among them Atrial fibrillation is the most common arrhythmia.<sup>17</sup> Our patient was presented with atrial fibrillation with fast ventricular rate which complicated her condition in acute heart failure setting on the background of covid myo-pericarditis.

## CONCLUSION

During this covid era, although patients are having milder symptoms after vaccination. Still there might be strong suspicion of covid myocarditis if a patient present with shortness of breath without any fever and prodromal symptoms. Bed side complementary tests such as echocardiogram, TDI and strain imaging can help to detect myo-pericarditis. Early detection of this condition and prompt treatment might save life. Regular monitoring and follow-up of acute heart failure are required.

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