Case report

Post Covid Cardiac Crisis: A Clinical Case Report

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Abstract:

Millions of people were infected during the last Covid pandemic and imposed a long term effect to the survivors. The incidence of post-COVID syndrome is estimated at 10–35%, while for hospitalized patients it may reach 85% among them nearly one-fourth have been diagnosed with cardiovascular complications. This case report is discussing about a 32 years old young man who went to Japan for higher education but came back during covid pandemic and developed fever, cough, respiratory distress and hemoptysis with which he was admitted to Covid ward at Shahid Ziaur Rahman Medical College Hospital (SZMCH). Relevant investigations revealed that he was Covid positive along with pneumonia (>50% lung involvement) and Hypertension. After one week, when his condition was stable he was discharged from hospital and advised for home quarantine for 14 days. But within 7 days of discharge, he again developed cough with hemoptysis, unusual fatigue, chest tightness and restlessness. That time he consulted with a cardiologist and physician found bilateral pneumonia along with dilated cardiomayopathy with Ejection Fraction 31%. After this devastating condition he was referred to Dhaka for better management and during follow-up we found his EF was 53% which was far better than the initial stage. Due to some rapid and prompt actions he survived but living with restricted activities.

Key Words: Covid-19, Post Covid Crisis, Complication, Cardiomyopathy.

Introduction

The First recorded Pandemic of world history happened in between 6th to 8th century (plague of Justinian) and then during 14th to early 19th century, 2nd plague pandemic (Black Death) tooks millions of life. Afterwards world experienced cholera, HIV/AIDS, different flu such as Swine flu, Russian flu, Asian flu, Spanish flu, MARS, SARS, appeared in the form of pandemic & epidemic worldwide.[1]

The severe acute respiratory syndrome Corona virus-2 (SARS-CoV-2) or Corona virus disease 2019 (COVID-19) initially surfaced in December 2019 from Wuhan, China, sweeping the world with various strains, forcing the WHO to declare a pandemic in March 2020. Shortly afterward, the virus spread rapidly across the world, (ultimately among 133 countries) sparking a global pandemic affecting hundreds of millions of people with millions of deaths worldwide.[2] COVID-19 can cause a wide range of clinical manifestations by affecting multiple systems.

COVID-19 manifests with a wide array of presentations, which ranges from fever, fatigue, and diarrhoea to severe respiratory and cardiovascular complications and multiple organ failure leading to mortality.[3]

Post-COVID syndrome was described in the spring of 2020 after the earliest COVID-19 cases were reported; observations declared that COVID-19 patients had symptoms that remained for several weeks or months after infection. The long-term complications of COVID are well known as post covid syndrome.[4]

Post-COVID-19 syndrome is poorly understood as it affects COVID19 survivors at all levels of disease severity and across all age ranges. The disease is most associated with post-discharge dyspnea and fatigue. However, other persistent symptoms as chest pains, palpitations, myalgia, smell and taste dysfunctions, cough, headache, gastrointestinal and cardiac-related problems.[5,6]

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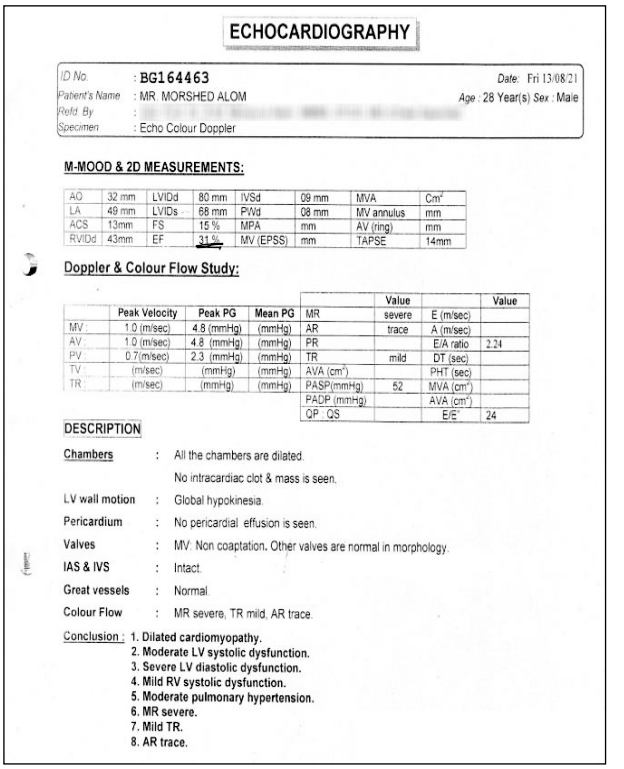
In this report, we discuss cardiac complication of post covid19 condition so that the most important outcomes and clinical practice is use to compare and collate the findings with clinical recommendations for patients care.

Case Report:

A 32 years old young man, from Uzgram, Gabtoli, Bogura went to Japan (Shimani) for higher education on agriculture in 2016, October. Besides that he took part-time job for Weekly 22 hours. Due to excessive work load with Lab works he faced sleep disturbance and different types of physical discomfort which ultimately diagnosed as high blood pressure and advised for changing dietary habit and sleep pattern by Japanese doctors. But there was no significant improvement. Then he stated anti hypertensive drugs advised by the local Doctor at Shimane, Japan and continued for two to three months. He had no previous history of hypertension but got family history. In April 2019 when he was working as a post doc. research assistant, at Japan Global Infrastructure Research Foundation, again suffered from raised blood pressure and suggested to modify lifestyle by university health center. During Covid pandemic situation he came Bangladesh on September, 2020. On June, 2021 his brother was diagnosed as a case of covid-19. During that time he had to take care of him which even needs to be close association without any protective measures. After 2-3 days he developed fever which was increasing day by day associated with cough & respiratory distress. Cough was gradually aggravated and hemoptysis started along with fever. He went to Shahid Ziaur Rahman Medical College Hospital Bogura (SZMCH) and due to covid pandemic situation, doctor advised him to get admitted into covid ward. Here he was diagnosed as covid positive by relevant investigation. With other investigations HRCT (Chest) was done and found "Covid-19 related pneumonia" where lung involvement was >50% & O_2 Saturation was 52%. Test like SGPT, RBS, S. creatinine, D-dimer, Ferritin, S.LDH, Hematology analysis, S. electrolytes, CRP all were done and found within normal range. He was discharged after 1 week of admission with advice of Tab. Amlodipine 5 mg, Tab. Doxofylline 200 mg, Tab. Montelukast, Tab. Levocetrizine Di-hydrochloride with advice of maintaining home quarantine. After 7 days of leaving hospital, he again developed cough with hemoptysis, unusual fatigue, chest tightness and restlessness. Then he went to a medicine specialist for further treatment on 1st August 2021. He was advised for some investigations like, sputum for AFB, Echocardiography (colour doppler), Chest X-ray and ECG. X-ray chest revealed mild Cardiomegaly with bilateral pneumonia, and echocardiography found dilated cardiomayopathy with EF 31% only. Then he was referred to SZMCH cardiology unit and admitted there for five days (from 14.8.2021 to 18.8.2021) and diagnosed as DCM with post covid status and managed with Tab. Spironolactone (20/50), Tab. Atorvastatin (20 mg), Tab. Aspirin (75mg), Tab. Valsartan (50mg), Tab. Ivabradine (5mg), Tab. Trimetazidine (35mg), Tab. Montelukast (10 mg) Tab. Esomeprazole. His condition was not improving as For further management he went to a medicine and cardiology specialist at Dhaka. Now his EF is 53% & he is feeling better with medication of Tab. Valsartan (100mg), Tab. Carvedilol (6.25mg), Tab. Eplerenone (25mg), Tab. Empagliflozin (10 mg), Tab. Fenofibrate (200 mg). He is stable but he could not complete his PhD course at Japan because his movement is restricted and now he is working as a sales man in a medicine shop at Bangladesh.



ECHOCARDIOGRAPHY

ID No. : BG164463 Date: Fri 13/08/21
Patient's Name : MR. MORSHED ALOM Age : 28 Year(s) Sex : Male
Refd. By :
Specimen : Echo Colour Doppler

M-MOOD & 2D MEASUREMENTS:

AO	32 mm	LVIDd	80 mm	IVSd	09 mm	MVA	Cm^2
LA	49 mm	LVIDs	68 mm	PWd	08 mm	MV annulus	mm
ACS	13mm	FS	15 %	MPA	mm	AV (ring)	mm
RVIDd	43mm	EF	31 %	MV (EPSS)	mm	TAPSE	14mm

Doppler & Colour Flow Study:

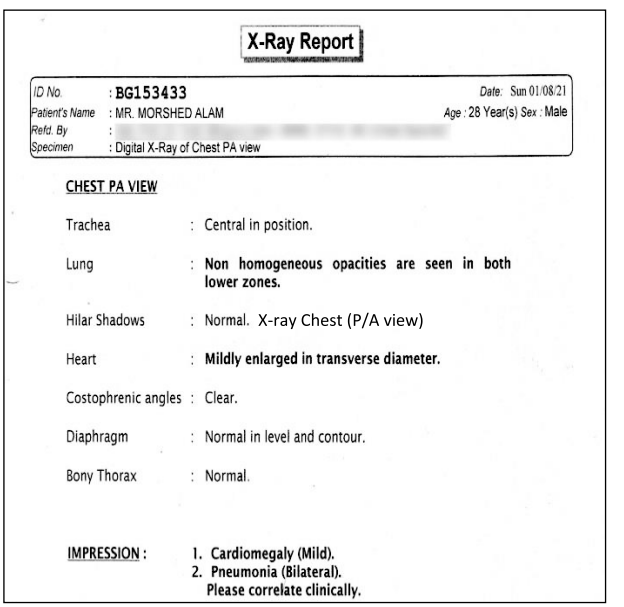
	Peak Velocity	Peak PG	Mean PG
MV	1.0 (m/sec)	4.8 (mmHg)	(mmHg)
AV	1.0 (m/sec)	4.8 (mmHg)	(mmHg)
PV	0.7(m/sec)	2.3 (mmHg)	(mmHg)
TV	(m/sec)	(mmHg)	(mmHg)
TR	(m/sec)	(mmHg)	(mmHg)

		Value		Value
MR	severe	E (m/sec)		
AR	trace	A (m/sec)		
PR		E/A ratio	2.24	
TR	mild	DT (sec)		
AVA (cm^2)		PHT (sec)		
PASP(mmHg)	52	MVA (cm^2)		
PADP (mmHg)		AVA (cm^2)		
QP : QS		E/E'	24	

DESCRIPTION

Chambers : All the chambers are dilated.
No intracardiac clot & mass is seen.
LV wall motion : Global hypokinesia.
Pericardium : No pericardial effusion is seen.
Valves : MV: Non coaptation. Other valves are normal in morphology.
IAS & IVS : Intact.
Great vessels : Normal
Colour Flow : MR severe, TR mild, AR trace.

Conclusion : 1. Dilated cardiomyopathy.
2. Moderate LV systolic dysfunction.
3. Severe LV diastolic dysfunction.
4. Mild RV systolic dysfunction.
5. Moderate pulmonary hypertension.
6. MR severe.
7. Mild TR.
8. AR trace.



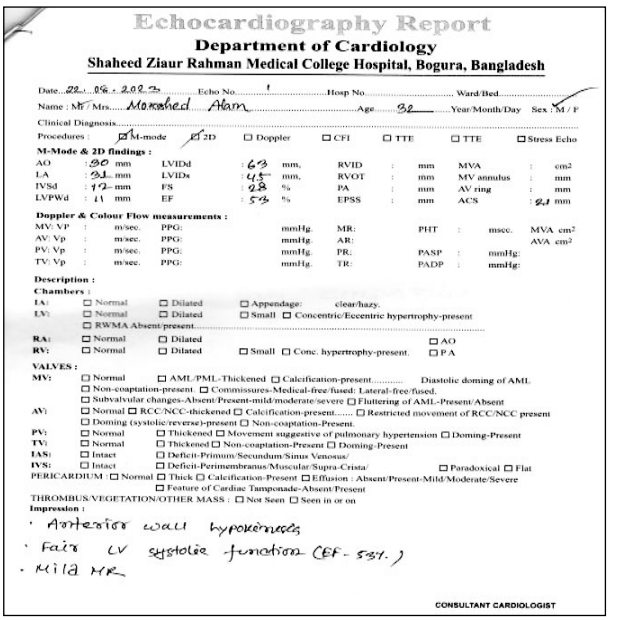
X-Ray Report

ID No. : BG153433 Date: Sun 01/08/21
Patient's Name : MR. MORSHED ALAM Age : 28 Year(s) Sex : Male
Refd. By :
Specimen : Digital X-Ray of Chest PA view

CHEST PA VIEW

Trachea : Central in position.
Lung : **Non homogeneous opacities are seen in both lower zones.**
Hilar Shadows : Normal. X-ray Chest (P/A view)
Heart : **Mildly enlarged in transverse diameter.**
Costophrenic angles : Clear.
Diaphragm : Normal in level and contour.
Bony Thorax : Normal.

IMPRESSION : 1. **Cardiomegaly (Mild).**
2. **Pneumonia (Bilateral).**
Please correlate clinically.



Echocardiography Report

Department of Cardiology

Shaheed Ziaur Rahman Medical College Hospital, Bogura, Bangladesh

Date: 22.06.2021 Echo No. 1 Hosp No. Ward/Bed

Name : Mr/Mrs. Morshed Alam Age 32 Year/Month/Day Sex : M / F

Clinical Diagnosis

Procedures : ☑ M-mode ☑ 2D ☐ Doppler ☐ CFI ☐ TTE ☐ TTE ☐ Stress Echo

M-Mode & 2D findings :

AO	: 30 mm	LVIDd	: 63 mm,	RVID	: mm	MVA	: cm2
LA	: 31 mm	LVIDs	: 45 mm,	RVOT	: mm	MV annulus	: mm
IVSd	: 12 mm	FS	: 28 %	PA	: mm	AV ring	: mm
LVPWd	: 11 mm	EF	: 54 %	EPSS	: mm	AC/S	: 2.1 mm

Doppler & Colour Flow measurements :

MV: Vp	: m/sec.	PPG:	mmHg.	MR:	PHT	: msec.	MVA cm2
AV: Vp	: m/sec.	PPG:	mmHg.	AR:			AVA cm2
PV: Vp	: m/sec.	PPG:	mmHg.	PR:	PASP	: mmHg:	
TV: Vp	: m/sec.	PPG:	mmHg.	TR:	PADP	: mmHg:	

Description :

Chambers :

LA: ☐ Normal ☐ Dilated ☐ Appendage: clear/hazy.

LV: ☐ Normal ☐ Dilated ☐ Small ☐ Concentric/Eccentric hypertrophy-present

☐ RWMA Absent/present.

RA: ☐ Normal ☐ Dilated ☐ AO

RV: ☐ Normal ☐ Dilated ☐ Small ☐ Conc. hypertrophy-present. ☐ P A

VALVES :

MV: ☐ Normal ☐ AML/PML-Thickened ☐ Calcification-present..... Diastolic doming of AML

☐ Non-coaptation-present. ☐ Commissures-Medical-free/fused: Lateral-free/fused.

☐ Subvalvular changes-Absent/Present-mild/moderate/severe ☐ Fluttering of AML-Present/Absent

AV: ☐ Normal ☐ RCC/NCC-thickened ☐ Calcification-present..... ☐ Restricted movement of RCC/NCC present

☐ Doming (systolic/reverse)-present ☐ Non-coaptation-Present.

PV: ☐ Normal ☐ Thickened ☐ Movement suggestive of pulmonary hypertension ☐ Doming-Present

TV: ☐ Normal ☐ Thickened ☐ Non-coaptation-Present ☐ Doming-Present

IAS: ☐ Intact ☐ Deficit-Primum/Secundum/Sinus Venosus/

IVS: ☐ Intact ☐ Deficit-Perimembranus/Muscular/Supra-Crista/ ☐ Paradoxical ☐ Flat

PERICARDIUM : ☐ Normal ☐ Thick ☐ Calcification-Present ☐ Effusion : Absent/Present-Mild/Moderate/Severe

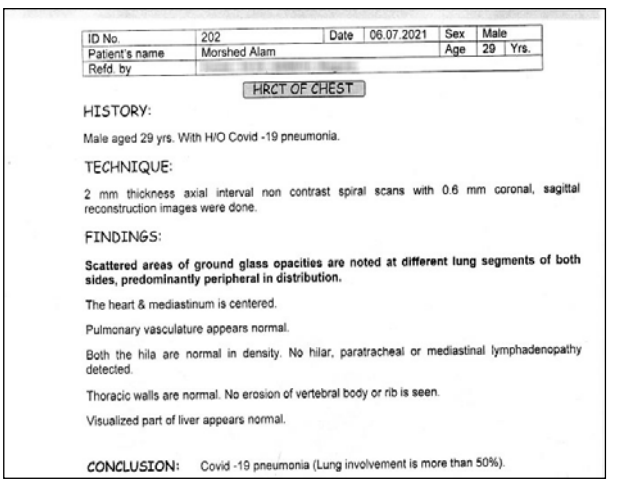
☐ Feature of Cardiac Tamponade-Absent/Present

THROMBUS/VEGETATION/OTHER MASS : ☐ Not Seen ☐ Seen in or on

Impression :

- Anterior wall hypokinesis
- Fair LV systolic function (EF - 54%)
- Mild MR

CONSULTANT CARDIOLOGIST



ID No.	202	Date	06.07.2021	Sex	Male
Patient's name	Morshed Alam			Age	29 Yrs.
Refd. by					

HRCT OF CHEST

HISTORY:

Male aged 29 yrs. With H/O Covid -19 pneumonia.

TECHNIQUE:

2 mm thickness axial interval non contrast spiral scans with 0.6 mm coronal, sagittal reconstruction images were done.

FINDINGS:

Scattered areas of ground glass opacities are noted at different lung segments of both sides, predominantly peripheral in distribution.

The heart & mediastinum is centered.

Pulmonary vasculature appears normal.

Both the hila are normal in density. No hilar, paratracheal or mediastinal lymphadenopathy detected.

Thoracic walls are normal. No erosion of vertebral body or rib is seen.

Visualized part of liver appears normal.

CONCLUSION: Covid -19 pneumonia (Lung involvement is more than 50%).

(N.B: All reports kept as record and name of the reporting doctors and institutions are blurred)

Discussion:

COVID-19 has been found to cause heart damage and consequently a number of heart problems, including cardiomyopathy (CMPs), even after people recover from COVID-19. Nearly one-fourth of those hospitalized with COVID-19 have been diagnosed with cardiovascular complications, which have contributed to roughly 40% of all COVID-19-related deaths.[7]

Before the pandemic, about 1% to 2% of acute coronary syndrome cases were attributed to stress-induced cardiomyopathy. During the pandemic, this number raise to about 8%. Some of these cases were traced to the havoc that the virus wreaks inside the body, but a large number developed in people who had tested negative for COVID-19.[8] Even a mild case of COVID-19 can lead to long-term, sometimes permanent, heart damage.[9]

COVID-19 has resulted in other organ involvement, and CMPs are among the most significant complications of this rapidly emerging disease, causing more severe disease and increased mortality rates[10,11] The patient's recovery and death rates were assessed in 20 studies that showed that 28.7% of patient's with one type of CMPs died following SARS-CoV-2 infection. Patients with cardiovascular co- morbidities had a higher risk of developing cardiac injury.[12]

In a systematic review study, hypertension was the most common underlying condition in CMPs following COVID-19, reported in 33% of patients.[13]

A study of >150,000 US veterans found that individuals with COVID-19 are at increased risk of cardiovascular disease including myocarditis beyond 30 days post-infection, even those who were not hospitalized during active infection.[14] Cardiac involvement of COVID-19 infection is an important clinical consequence to recognize. One study reported cardiac magnetic resonance imaging (MRI)-proven myocardial inflammation in 60% of patients who had recently recovered from COVID.[15] Another study showed that 7%-20% of patients with COVID-19 had elevated cardiac biomarkers or electrocardiogram (ECG) abnormalities indicating underlying myocardial injury or ischemia [16]. Another study showed that up to 20%-30% of patients hospitalized with COVID-19 has evidence of myocardial involvement.[17]

In conclusion, cardiac injury and CMPs, including exacerbation of an underlying CMPs or the emergence of new CMPs, are common in COVID-19 patients. Moreover, they are associated with higher mortality and morbidity in these patients. Common fatal conditions in patients with COVID19 CMPs include multiorgan damage, ARDS, and cardiogenic shock. Therefore, diagnostic mea- sores of COVID-19 should consist of underlying cardiovascular comorbidities.

Conclusion

The emergence of post-COVID 19 cardiovascular manifestations is expected to impose a further detrimental effect on the incidence, prevalence, and economic projections of heart disease. Limited elucidation of its clinical course has prompted the requirement to ascertain the persistent symptoms and clinical outcomes. History, signs, and symptoms of cardiac injury should be considered in evaluating these patients early in the course of this novel disease, and prompt therapeutic measures for the prevention of exacerbating cardiac condition should be sought.

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