



## DIFFERENT CLINICAL PRESENTATIONS OF COVID19 RELATED LEFT VENTRICULAR THROMBUS.

### General Medicine

|                             |                                                                                                                                 |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------|
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### ABSTRACT

Left Ventricular (LV) thrombus is most often seen in patients with large, anterior ST-elevation Myocardial infarction (MI) with antero-apical aneurysm.

In most cases, these infarcts occur in the distribution of the left anterior descending coronary artery. These antero-apical infarcts have large areas of poorly contracting LV muscle; adjacent intra-cavitary blood movement is sluggish (stasis) compared with normal areas. This relative stasis of blood is thought to increase the risk of thrombus formation. Recent studies show that stasis of blood occur along with micro vascular complications with SARS COVID19 virus infection, which can lead to MI and thrombus formation.

### KEYWORDS

LV thrombus, SARS COVID19

### INTRODUCTION

Left ventricular (LV) thrombus is a major cause of embolic stroke after acute myocardial infarction (MI). Patients with large anterior MI are at the highest risk for the development of LV thrombi; these patients usually have an LV ejection fraction (LVEF) less than 30 percent and a severe antero-apical or basal inferolateral wall motion abnormality with aneurysm on an imaging study.

LV thrombus is most often seen in patients with large, anterior ST-elevation MI with antero-apical aneurysm. In most cases, these infarcts occur in the distribution of the left anterior descending coronary artery. Recent studies show that due to SARS COVID19 virus infection and it's micro vascular complications can lead to a pro thrombotic state.

Many, but not all, of these patients will have an LV apical aneurysm with akinesis or dyskinesis. In most cases, thrombus is located within or adjacent to the LV apex but can also occur with large basal inferolateral infarctions/aneurysms.

Also, Contact of blood with the fibrous tissue in the aneurysm rather than normal endocardium is also thought to trigger clot formation.

There are relatively few reports on the clinical course of SARS COVID19 related LV thrombus, so the objective of this prospective study was to investigate and compare the different clinical outcomes.

#### CASE-1

68/Male driver complaints of:

Dyspnoea on exertion, cough, chest discomfort, and uneasiness since 30 mins,

(NYHA grade 3-4)

Orthopnoea+, PND+

Known case of HTN, IHD, since 10 years.

Chronic alcoholic, smoker.

COVID (RT-PCR) positive a month back, was not admitted  
1st dose of COVID Vaccine taken- {COVAXIN} a month back  
ECG s/o - Acute anterior wall MI

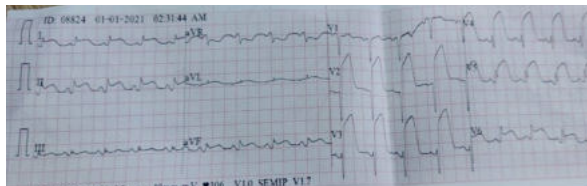
#### On examination:

Icterus +, JVP raised, b/l fine crepitations +, tender Hepatomegaly +

#### Blood investigations:

|                             |                                       |
|-----------------------------|---------------------------------------|
| <b>S.Creatinine (mg/dL)</b> | <b>1.5</b>                            |
| <b>NA/K/Cl (mmol/L)</b>     | <b>134/5/98</b>                       |
| <b>TROP I (ng/ml)</b>       | <b>3.5</b>                            |
| <b>CKMB (ng/ml)</b>         | <b>21</b>                             |
| <b>BNP (pg/ml)</b>          | <b>189</b>                            |
| <b>COVID status</b>         | <b>Post covid19 (MILD), Recovered</b> |

#### ECG:



#### 2D Echo:

RWMA+

LVH/DD+

Anterior wall, apical, antero-septal, and septal hypokinesia.

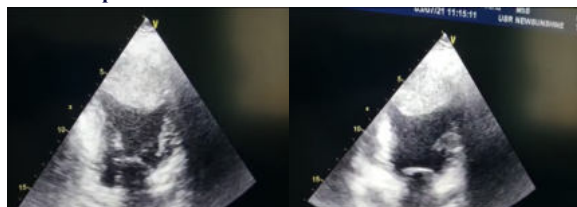
LVEF- 30-35%

Severe MR/moderate TR

Large thrombus confined to LV apex

PASP- 49mmhg.

#### 2D ECHO pictures:



#### Treatment and Outcome:

Admitted in MICU

Stenting done in LAD

LMWH

DAPT given

Advice surgery.

Patient expired before surgery.

#### CASE-2

52/Male security guard complaints of:  
Cough, Abdominal distension, and b/l pedal edema, dyspnoea on exertion (NYHA grade 2-4)  
Orthopnoea +, PND +,  
Known case of type 2 Diabetes mellitus , CRF and IHD since 5 years, double vessel disease (post PTCA). Not taking treatment for any.  
Patient- COVID (RTPCR) positive 2 months back, had required ICU admission for the same, was on ventilator for 4 days.  
Ecg s/o- LBBB with anterior wall ischemia

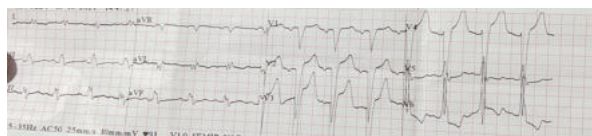
#### On examination:

Pallor +, b/l pitting pedal edema + , JVP raised, b/l fine crepitations +, abdomen-distended, ascites+

#### Blood Investigations:

|                              |                                         |
|------------------------------|-----------------------------------------|
| <b>S. Creatinine (mg/dL)</b> | <b>2.57</b>                             |
| NA/K/Cl(mmol/L)              | 127/6.8/97                              |
| PT/INR(sec)                  | 30.4/2.14                               |
| TROP I (ng/ml)               | <0.01                                   |
| CKMB (ng/ml)                 | 2.2                                     |
| <b>BNP (pg/ml)</b>           | <b>1390</b>                             |
| <b>COVID status</b>          | <b>Post covid19 (SEVERE), recovered</b> |

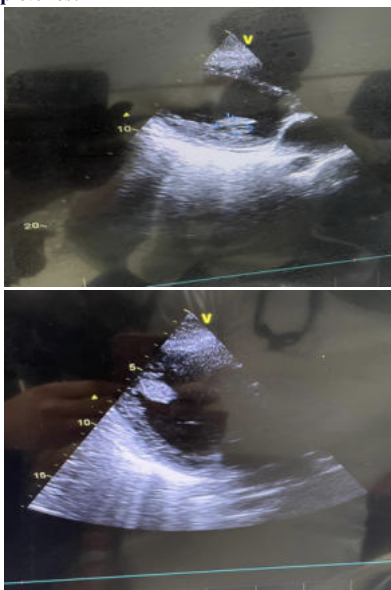
#### ECG:



#### 2D Echo:

**Dilated all four chambers**  
**Severe LV systolic dysfunction**  
**Global LV hypokinesia**  
**Grade 2 DD+**  
**LVEF- 10-15%**  
**Severe MR/moderate TR**  
**Organised LV thrombus measuring 2.4x1.7cm**  
**PASP-42mmhg**

#### 2D ECHO pictures:



#### Treatment and Outcome:

PTCA to LAD done  
LMWH  
DAPT given  
Was started on tab Rivaroxaban 10mg OD  
Advice regular follow ups.

#### Case- 3

44/Male, Builder, complaints of:  
palpitations since 3 hours.  
sudden onset chest pain, radiating to upper arm and back a/w dyspnoea (NYHA grade 3-4), and perspiration,

Known case of hypertension since 1 year, not on regular treatment or follow up.

Chronic smoker.

No history of covid or covid contact.

ECG - suggestive of extensive anterior wall MI.

HRCT chest- Not suggestive of COVID

Rapid Antigen Test for COVID- negative

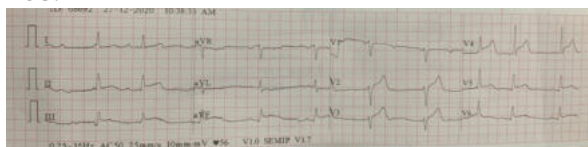
On examination: Conscious but not oriented to time place and person  
JVP raised, S1,S2+, systolic murmur+, b/l coarse crepitations +, Rhonci+

GCS- E4V4M5

#### Blood Investigations:

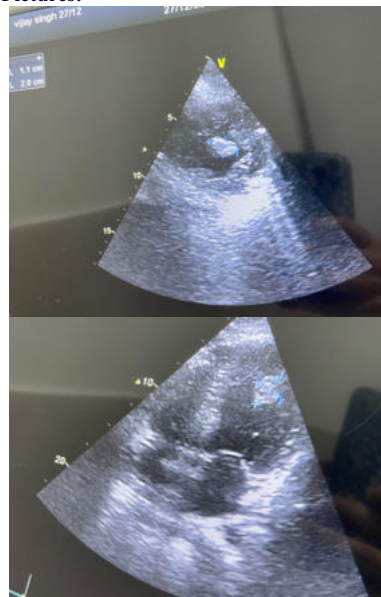
|                      |                                    |          |
|----------------------|------------------------------------|----------|
| S.Creatinine (mg/dL) | 1.8                                |          |
| NA/K/Cl(mmol/L)      | 138/3.2/98                         |          |
| TROP I (ng/ml)       | 10                                 |          |
| CKMB (ng/ml)         | 34                                 |          |
| BNP (pg/ml)          | 159                                |          |
| COVID Status         | Anti-SARS-COV2 antibodies Positive | Positive |
| D dimer              | >1600                              |          |

#### ECG:



#### 2D Echo:

**RWMA+**  
**LVH/DD+**  
**Infero-septal, antero-septal, anterior wall, antero-lateral wall hypokinetic**  
**LVEF- 20-25%**  
**Moderate MR/Moderate TR**  
**LV apical thrombus present, mobile, measuring 2x1.1 cm**  
**PASP-45mmhg**  
**2D ECHO Pictures:**



#### Treatment and Outcome:

CCU admission, ventilatory and inotropic support,  
Patient developed embolic stroke  
Patient expired before he could be taken up for angiography.

#### DISCUSSION:

According to COMMANDER, HELAS and WASH trials, For patients with MI and documented LV thrombus, Direct-acting oral anticoagulants (DOAC; also referred to as non-vitamin K antagonist oral anticoagulants) should be preferred to warfarin for prophylaxis for LV thrombus.

For patients with MI and no clear thrombus but an LVEF less than 30 with antero-apical or basal inferior/inferolateral wall akinesis/dyskinesis and aneurysm, prophylactic anticoagulation should be considered.

In addition to MI, true LV thrombus may occur in other conditions such as stress cardiomyopathy, myocarditis and post COVID19 virus infection.

### RESULTS:

All patients who developed LV thrombus turned out to be COVID positive 2 out of 3 patients in the study expired, one is on regular follow up with department of medicine and cardiology.

### CONCLUSION :

For patients who have tested positive for SARS COVID19; even with mild symptoms, presenting with MI a possibility of LV thrombus should be kept in mind.

The relative benefits and risks of anticoagulation need to be weighed carefully in such patients.

Anticoagulation in COVID19 is recommended to avoid such life threatening complications.

### REFERENCES

1. Harrison's textbook of medicine.
2. Braunwald's textbook of cardiology.
3. Weinsaft JW, Kim J, Medicherla CB, et al. Echocardiographic Algorithm for Post-Myocardial Infarction LV Thrombus: A Gatekeeper for Thrombus Evaluation by Delayed Enhancement CMR. JACC Cardiovasc Imaging 2016; 9:505.
4. Visser CA, Kan G, Meltzer RS, et al. Embolic potential of left ventricular thrombus after myocardial infarction: a two-dimensional echocardiographic study of 119 patients. J Am Coll Cardiol 1985; 5:1276.
5. Asinger RW, Mikell FL, Elspeger J, Hodges M. Incidence of left-ventricular thrombosis after acute transmural myocardial infarction. Serial evaluation by two-dimensional echocardiography. N Engl J Med 1981; 305:297.
6. Nihoyannopoulos P, Smith GC, Maseri A, Foale RA. The natural history of left ventricular thrombus in myocardial infarction: a rationale in support of masterly inactivity. J Am Coll Cardiol 1989; 14:903.
7. Küpper AJ, Verheugt FW, Peels CH, et al. Left ventricular thrombus incidence and behavior studied by serial two-dimensional echocardiography in acute anterior myocardial infarction: left ventricular wall motion, systemic embolism and oral anticoagulation. J Am Coll Cardiol 1989; 13:1514.
8. Keren A, Goldberg S, Gottlieb S, et al. Natural history of left ventricular thrombi: their appearance and resolution in the posthospitalization period of acute myocardial infarction. J Am Coll Cardiol 1990; 15:790.
9. Weinreich DJ, Burke JF, Pauletto FJ. Left ventricular mural thrombi complicating acute myocardial infarction. Long-term follow-up with serial echocardiography. Ann Intern Med 1984; 100:789.
10. Vecchio C, Chiarella F, Lupi G, et al. Left ventricular thrombus in anterior acute myocardial infarction after thrombolysis. A GISSI-2 connected study. Circulation 1991; 84:512.
11. Chiarella F, Santoro E, Domenicucci S, et al. Predischarge two-dimensional echocardiographic evaluation of left ventricular thrombosis after acute myocardial infarction in the GISSI-3 study. Am J Cardiol 1998; 81:822.