Anterior Wall Myocardial Infarction (STEMI) in a patient with COVID-19 Infection

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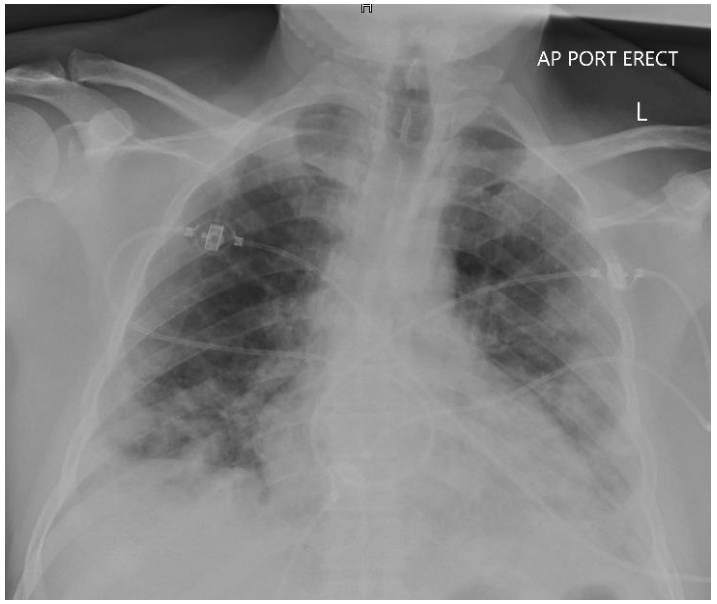
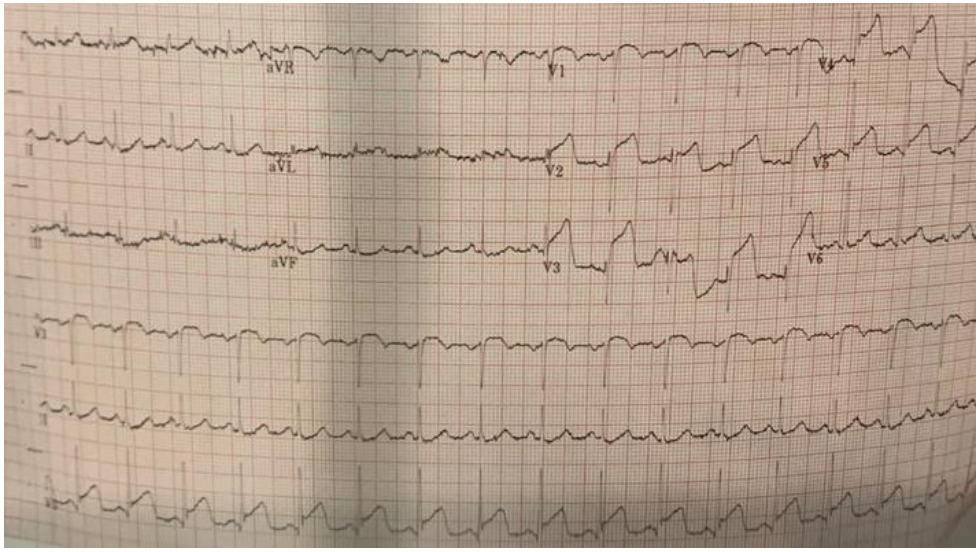
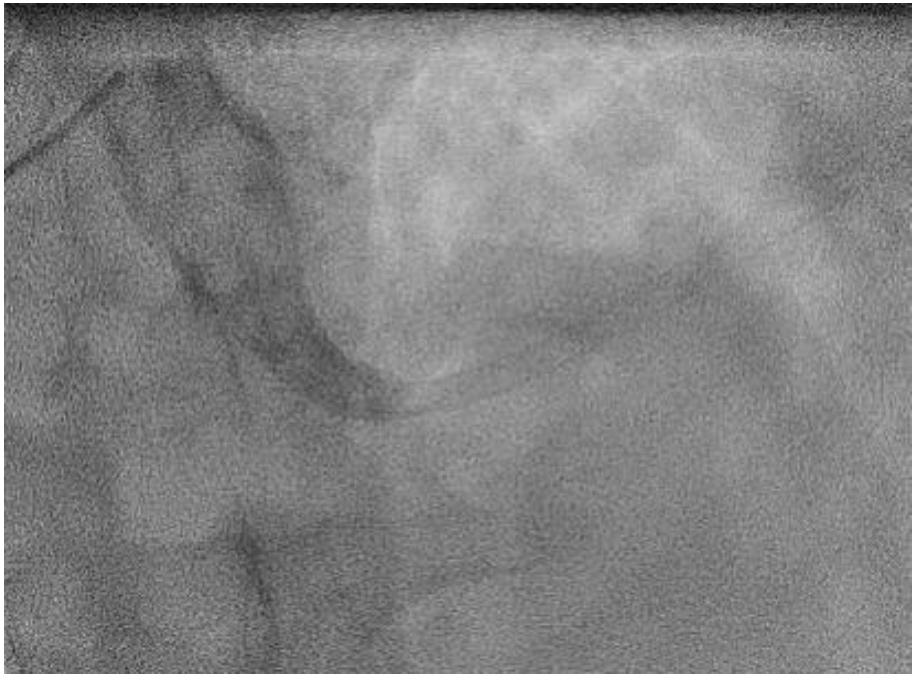
CASE HISTORY

- 54 y/o man
- Admitted with worsening respiratory symptoms consistent with COVID-19 pneumonitis
- No past medical history
- Day 12 : Severe central chest pains
- ECG : Anterior STEMI
- He was immediately taken to the cathlab for emergency PCI





Coronary Angiogram



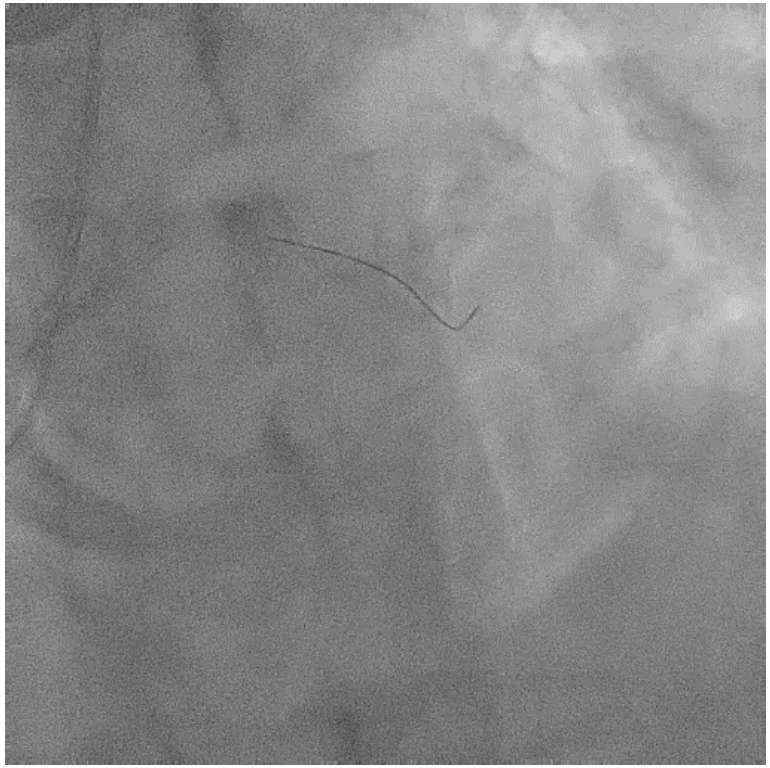
RRA using 6F sheath , JL3.5 , JR4 ,

LM : Normal

LAD : Mid Total Occlusion

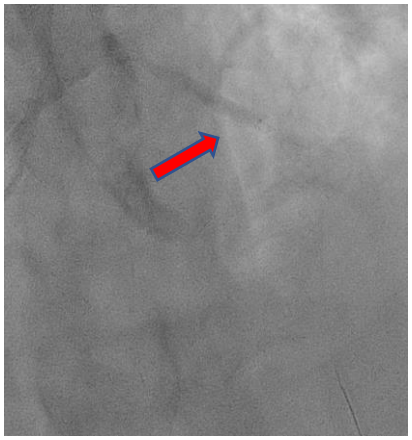
LCX : Normal

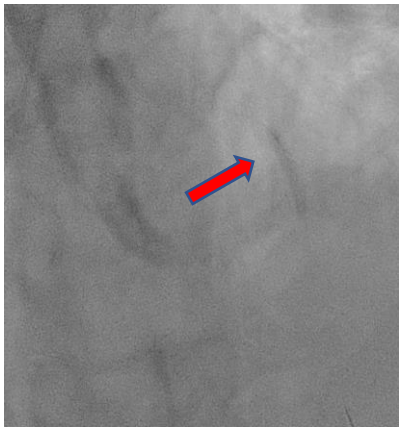
RCA : Normal

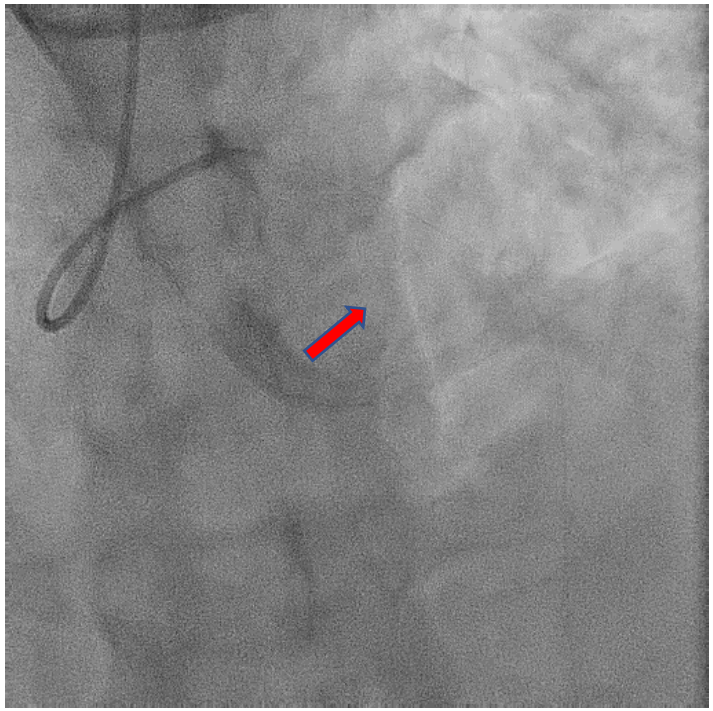


Guide EBU 4

Sion Blue wire crossed the lesion smoothly which indicates acute occlusion



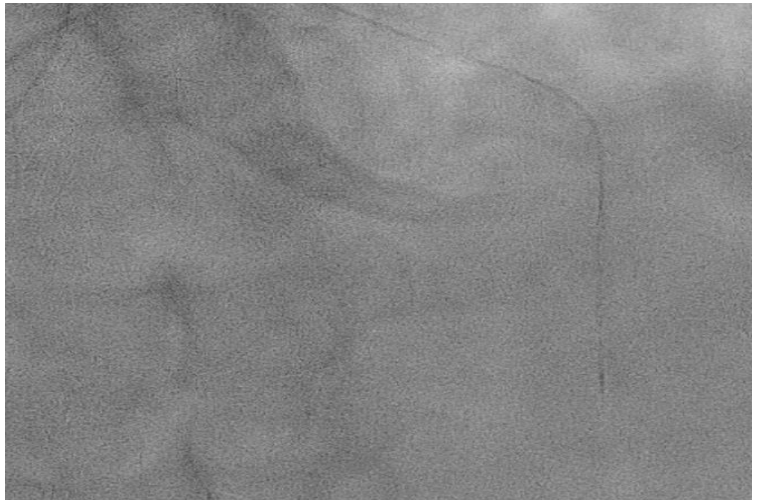


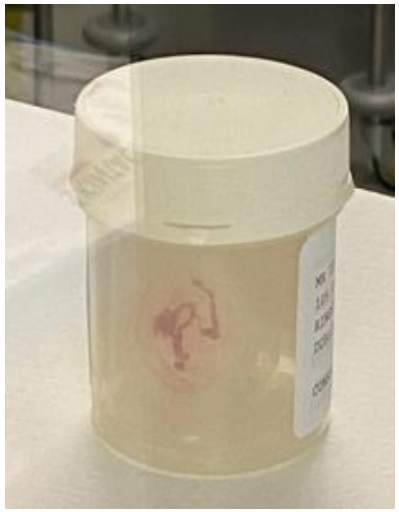


Pre-dilatation using 3.5 X 20 mm balloon inflated at 16 atm

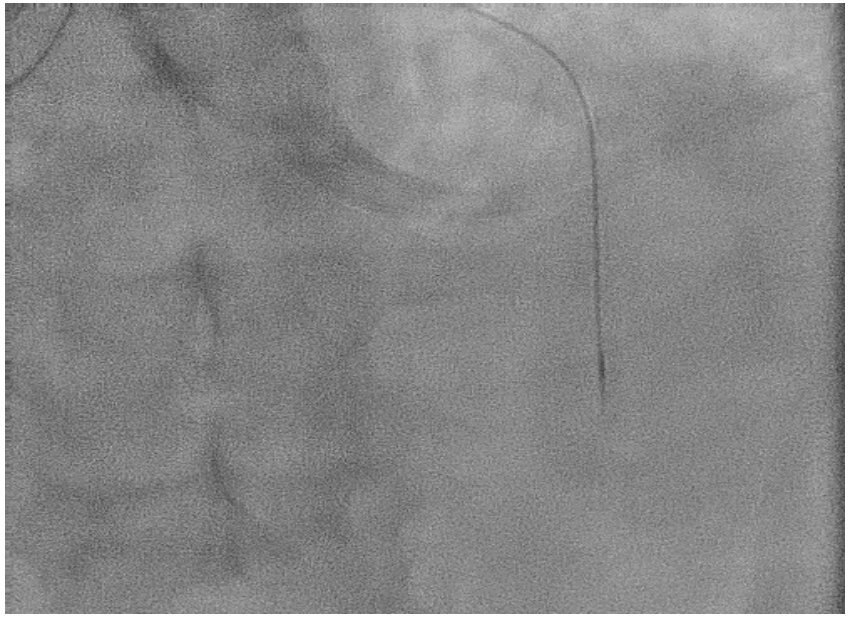
Visualization of LAD post multiple dilatation

Multiple large thrombi can be seen in mid LAD with slight improvement of flow (TIMI Flow 1)



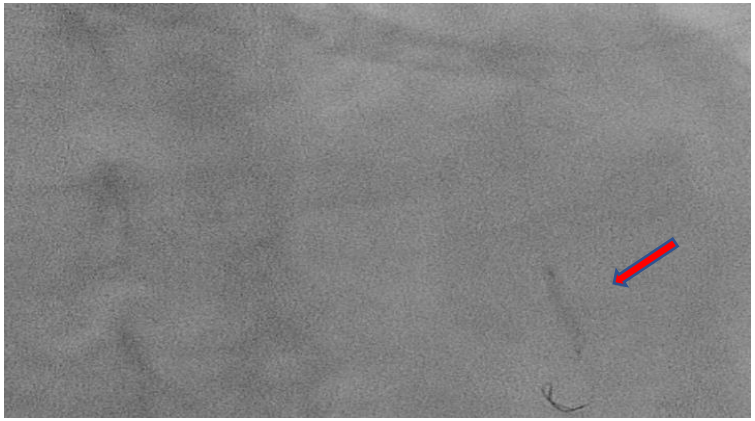


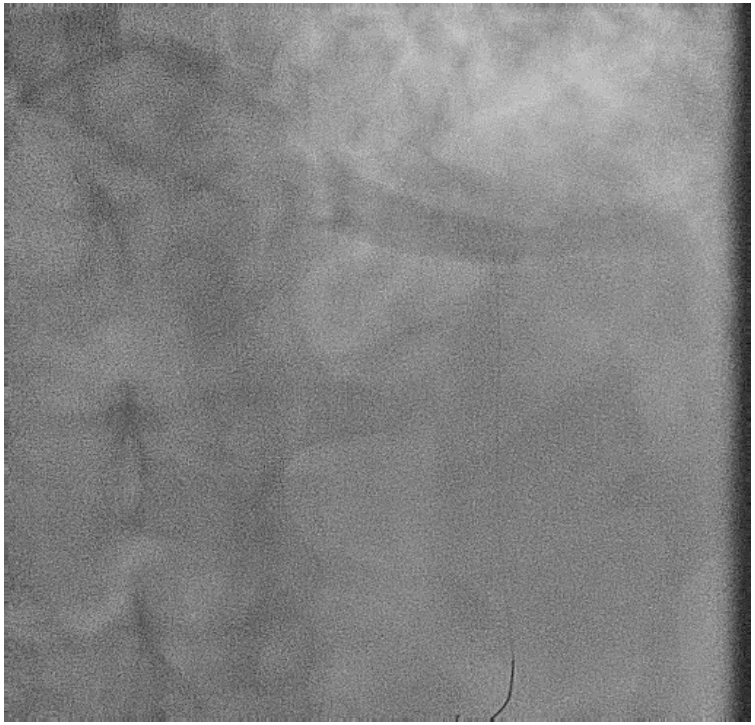
An aspiration catheter was used to extract large amounts of **thrombus** from the LAD



Micro-catheter with TIP injection showed multiple **small thrombi** in the distal LAD

Final Result



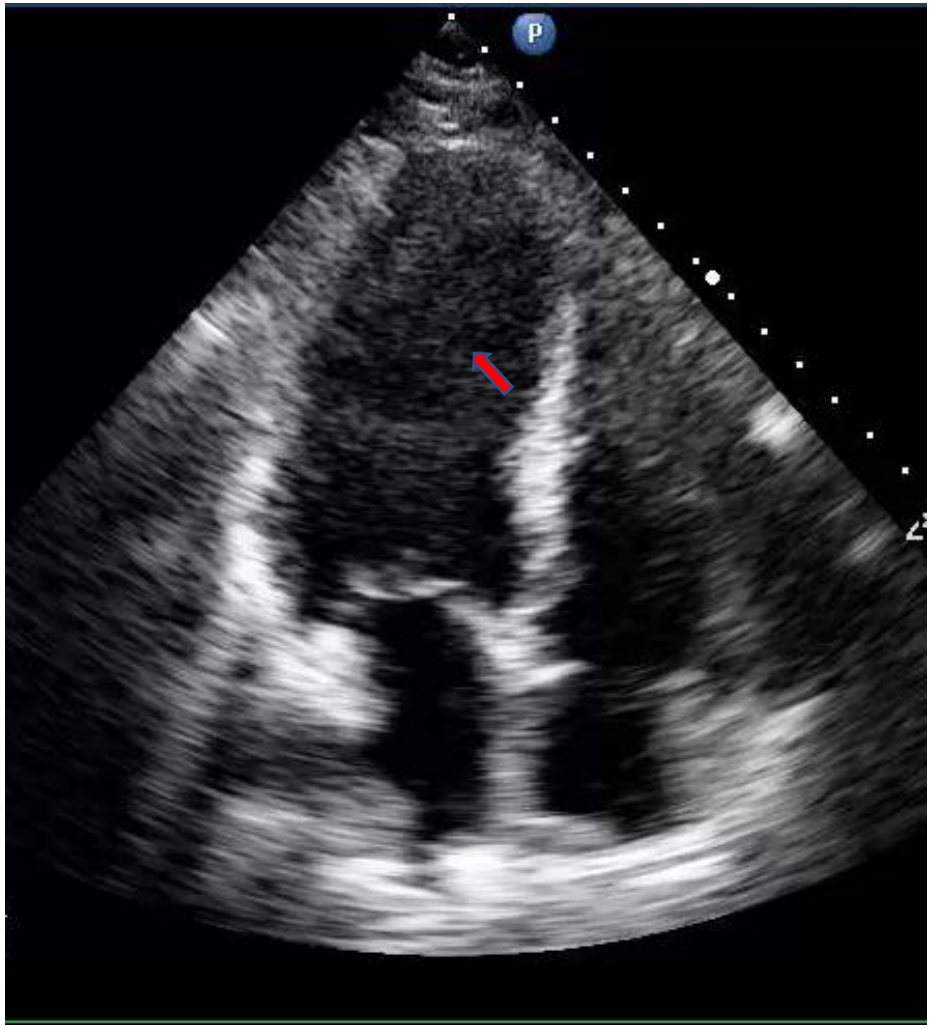


Multiple dilatation distally in the occluded vessel using
2.5 X 20 mm balloon inflated at 12 atm

Integrellin® IC was commenced after multiple balloon dilatations

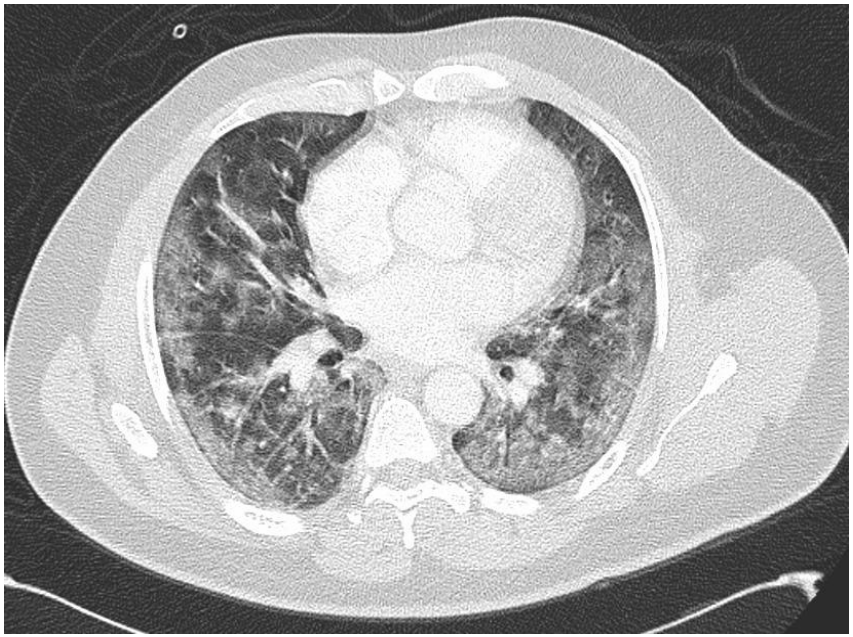
LAD was visualized with TIMI flow I distally

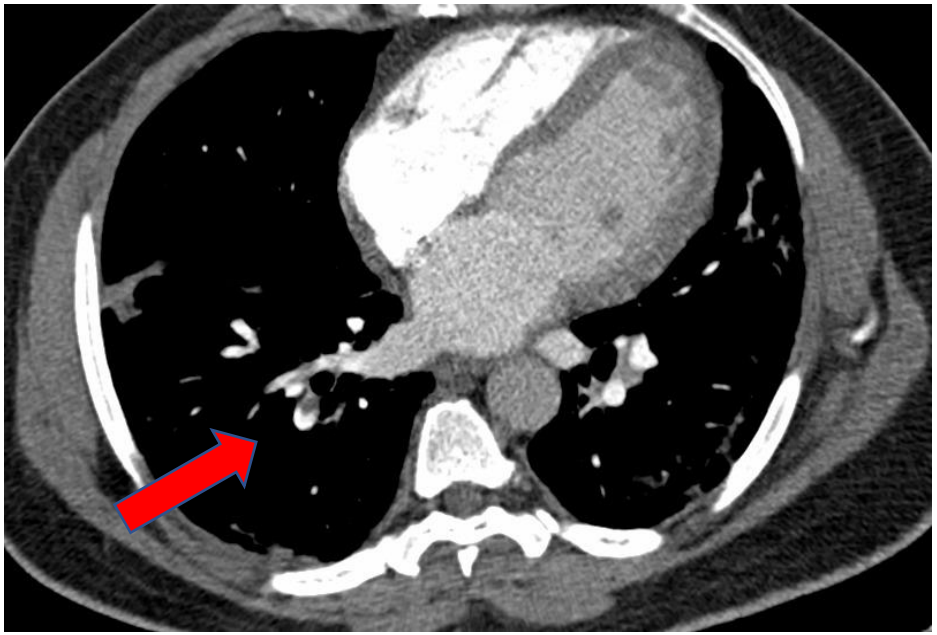
ECHOCARDIOGRAPHY



EF 45%
Apical akinesia
Antero-septal akinesia
Inferior wall hypokinesia
Spontaneous echo contrast
observed in LV cavity

CLINICAL COURSE





The HRCT shows extensive subpleural and peribronchovascular ground-glass infiltrates

Transferred to ICU for intensive monitoring and strict respiratory isolation after PCI

2 days later, patient developed pleuritic chest pains in keeping with pulmonary embolism

Troponin T (hs): **8432** mg/dl (peak)
D-Dimer : **4.24** (0-0.5) µgFEU/ml
Interleukin-6: Markedly elevated

DISCUSSION

- COVID-19 has been associated with various **cardiovascular complications** such as myocarditis, arrhythmias and ACS. [1]

- **Acute myocardial injury** seen in COVID-19 pneumonitis could be caused by plaque rupture, hypoxic injury, coronary spasm, microthrombi or direct vascular damage. [2]

- Excess inflammation triggered by the cytokine storm,platelet and macrophage activation and endothelial dysfunction leads to a **hypercoagulable state**. [3]

- **Clinical biomarkers** such as D-Dimers, Troponin T(hs), CRP and IL-6 have a role in predicting adverse complications.

References :

1. Ueki Y, Otsuka T, Windecker S, Räber L. ST-elevation myocardial infarction and pulmonary embolism in a patient with COVID-19 acute respiratory distress syndrome. *Eur Heart J*. 2020;41(22):2134. doi:10.1093/eurheartj/ehaa399

2. Driggin E, Madhavan MV, Bikdeli B, et al. Cardiovascular Considerations for Patients, Health Care Workers, and Health Systems During the COVID-19 Pandemic. *J Am Coll Cardiol*. 2020;75(18):2352-2371. doi:10.1016/j.jacc.2020.03.031

3. Xiong TY, Redwood S, Prendergast B, Chen M. Coronaviruses and the cardiovascular system: acute and long-term implications. *Eur Heart J*. 2020;41(19):1798-1800. doi:10.1093/eurheartj/ehaa231

CONCLUSION

- Our case report illustrates the **cardio-pulmonary complications** of COVID-19 seen in a 54 y/o gentleman with no cardiovascular risk factors.

- COVID-19 infection caused by the SARS-CoV-2 virus is most likely associated with a **prothrombotic state.**

- The management of ACS in COVID-19 patients with PCI is safe and feasible but requires **multi-dimensional** input from intensivists, cardiologists and infectious disease specialists.

- This study adds to a growing body of evidence suggesting that myocardial injury with ST-segment elevation is potentially a **lethal** complication of COVID-19 infection.