PULMONARY HYPERTENSION AND PREGNANCY.

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- 26 year old woman, home maker
- Primi gravida (28+ 5 weeks period of gestation)

Presented

- 2 days - **Breathlessness** (sudden onset, MMRC grade 4)
- 2 days – **Cough** (sudden onset, intermittent, dry cough)
- Cough had streaks of blood for 1 day.

Negative history

- There is no H/O wheeze, fever, chest pain.

Past history

- She is a known case of bronchial asthma , not on regular medicines.

On examination

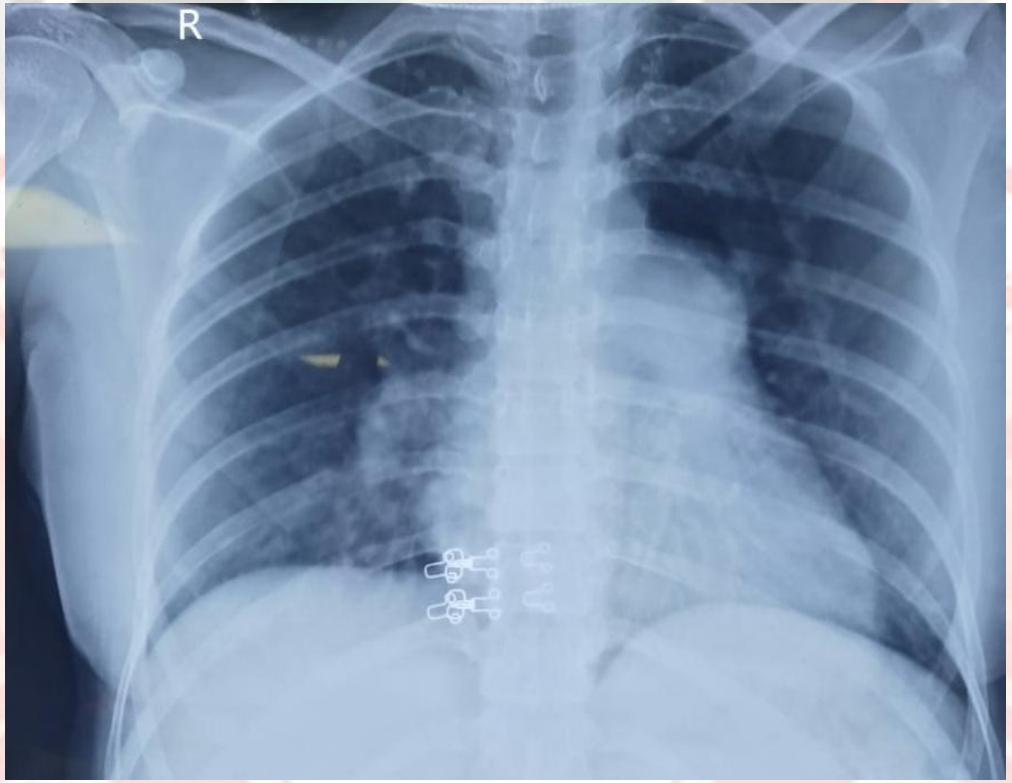
- Pulse rate -115 / min
- Blood pressure - 110/70 mmhg, right arm supine position
- Respiratory rate - 28 cycles /min
- Spo2 - 88 % room air.
- Afebrile.
- Pallor present.
- No pedal edema.

Covid antigen negative.

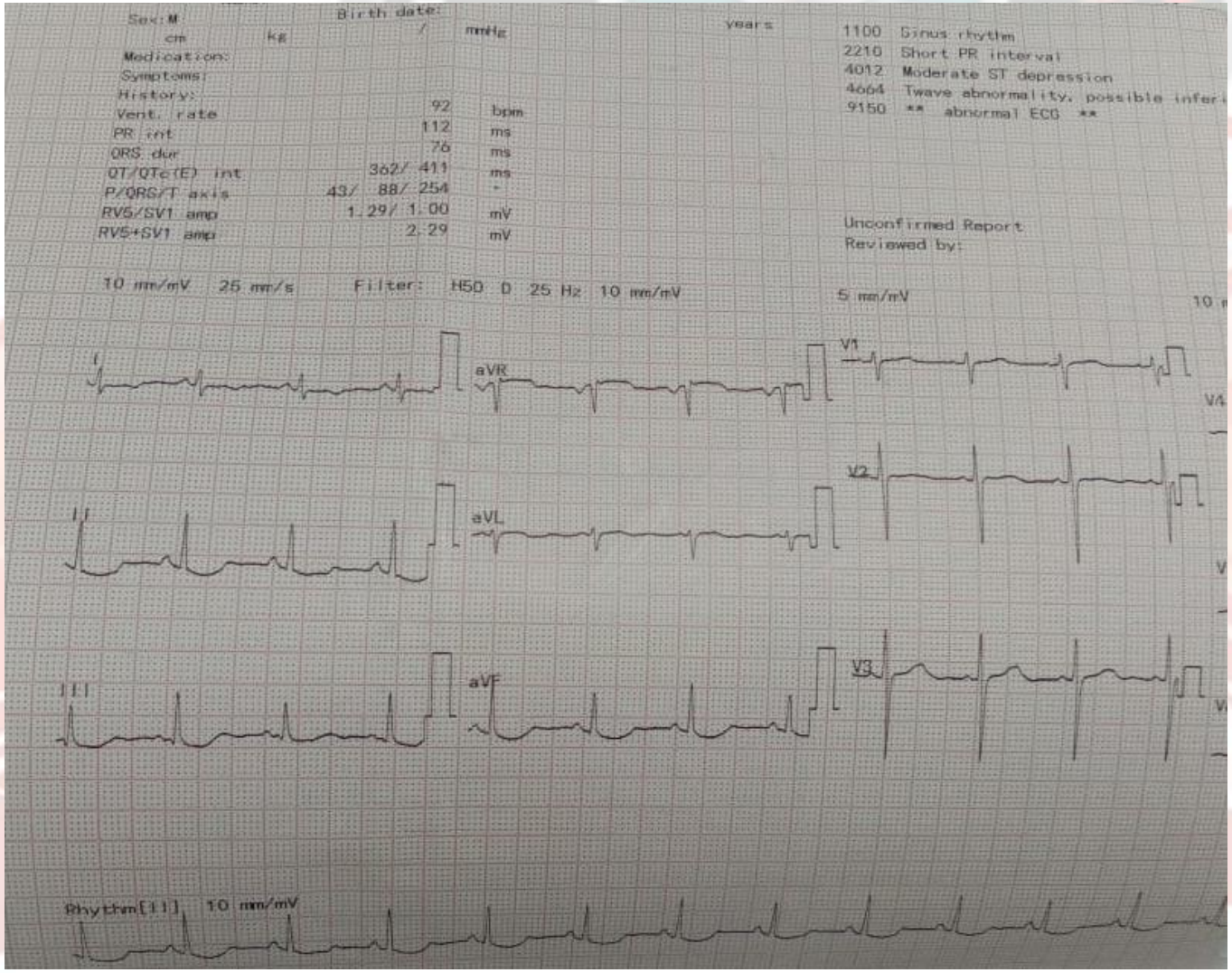
started on oxygen via venturi mask , 50 % fio2, 12 L o2, saturation improved to 96 %.

admitted as covid suspect in ICU.

CHEST RADIOGRAPH



ECG


Sex:M
Birth date:
/
years
cm
kg
mmHg
Medication:
Symptoms:
History:
Vent. rate 92 bpm
PR int 112 ms
QRS dur 76 ms
QT/QTc(E) int 362/ 411 ms
P/QRS/T axis 43/ 88/ 254 °
RV5/SV1 amp 1.29/ 1.00 mV
RV5+SV1 amp 2.29 mV
1100 Sinus rhythm
2210 Short PR interval
4012 Moderate ST depression
4664 Twave abnormality, possible infer
9150 ** abnormal ECG **
Unconfirmed Report
Reviewed by:
10 mm/mV 25 mm/s
Filter: H50 D 25 Hz 10 mm/mV
5 mm/mV
I
aVR
V1
II
aVL
V2
III
aVF
V3
Rhythm[II] 10 mm/mV

ABG

- PH- 7.434
- PCO2 – 27
- PO2 – 85
- HCO3 - 18

TC - 12600 **Hb - 10.7** **PLT - 167000**	**Urea - 7** **Creatinine - 0.6**
D dimer - 761	PT - 12.7 INR 1.07

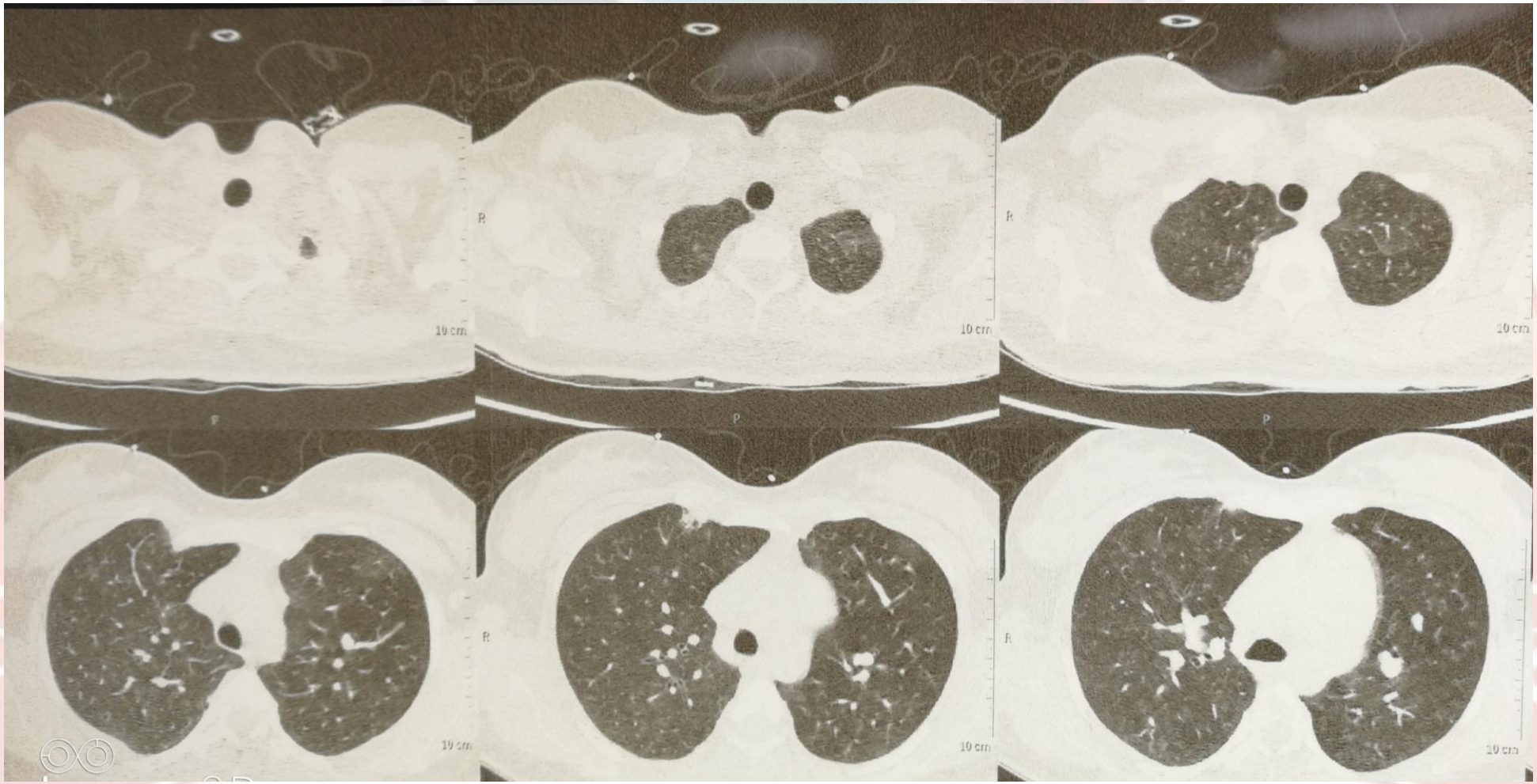
DIFFERENTIAL DIAGNOSIS

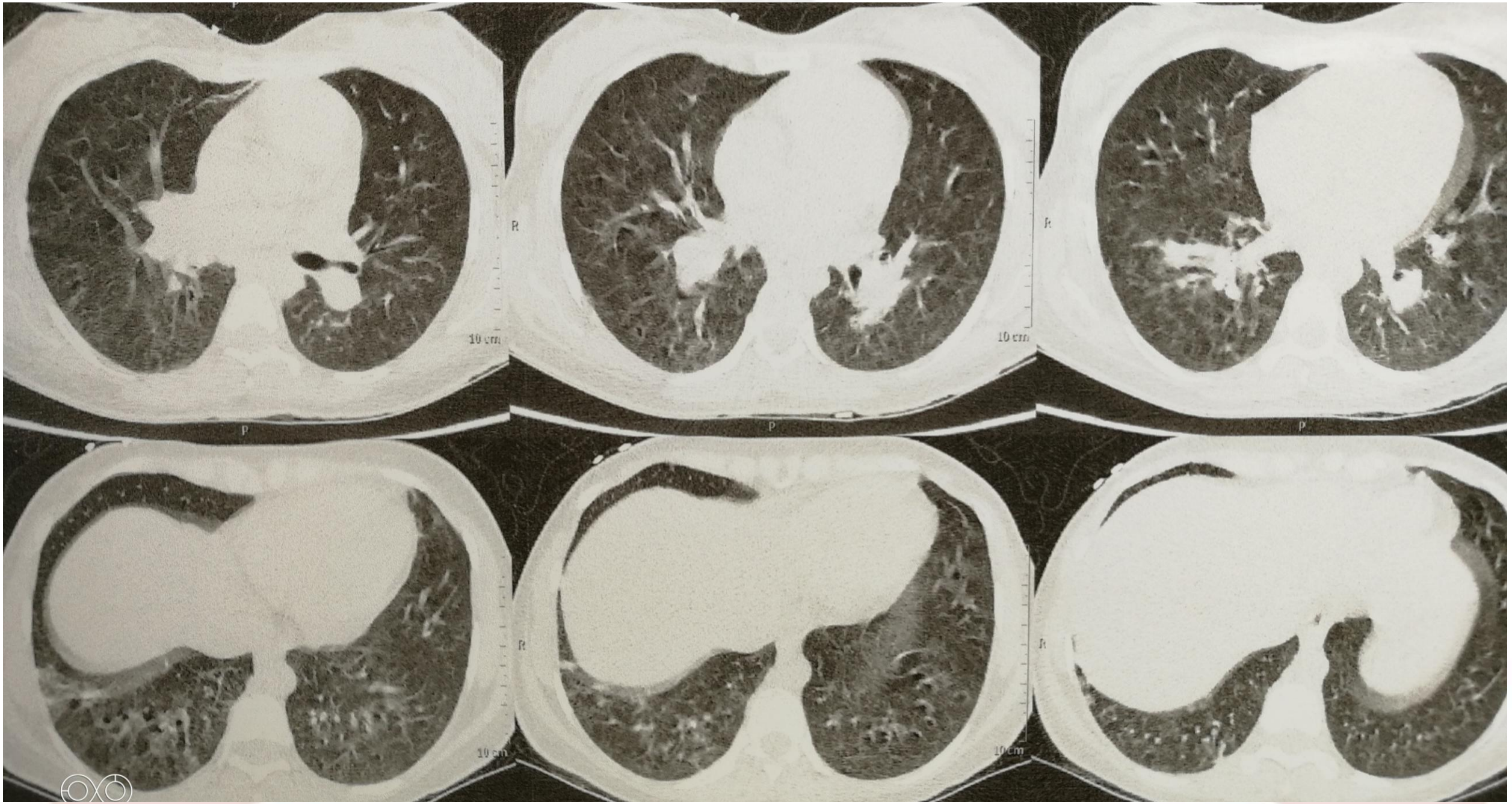
Acute Pulmonary Embolism.

Covid – 19 pneumonia

Acute Asthma exacerbation

HRCT thorax done which showed subpleural consolidation and GGO in right lower lobe, GGO in bilateral upperlobe along with dilated pulmonary artery.




10 cm
R
P
10 cm
R
P
10 cm
R
P
10 cm
R
10 cm
R

2-D ECHO

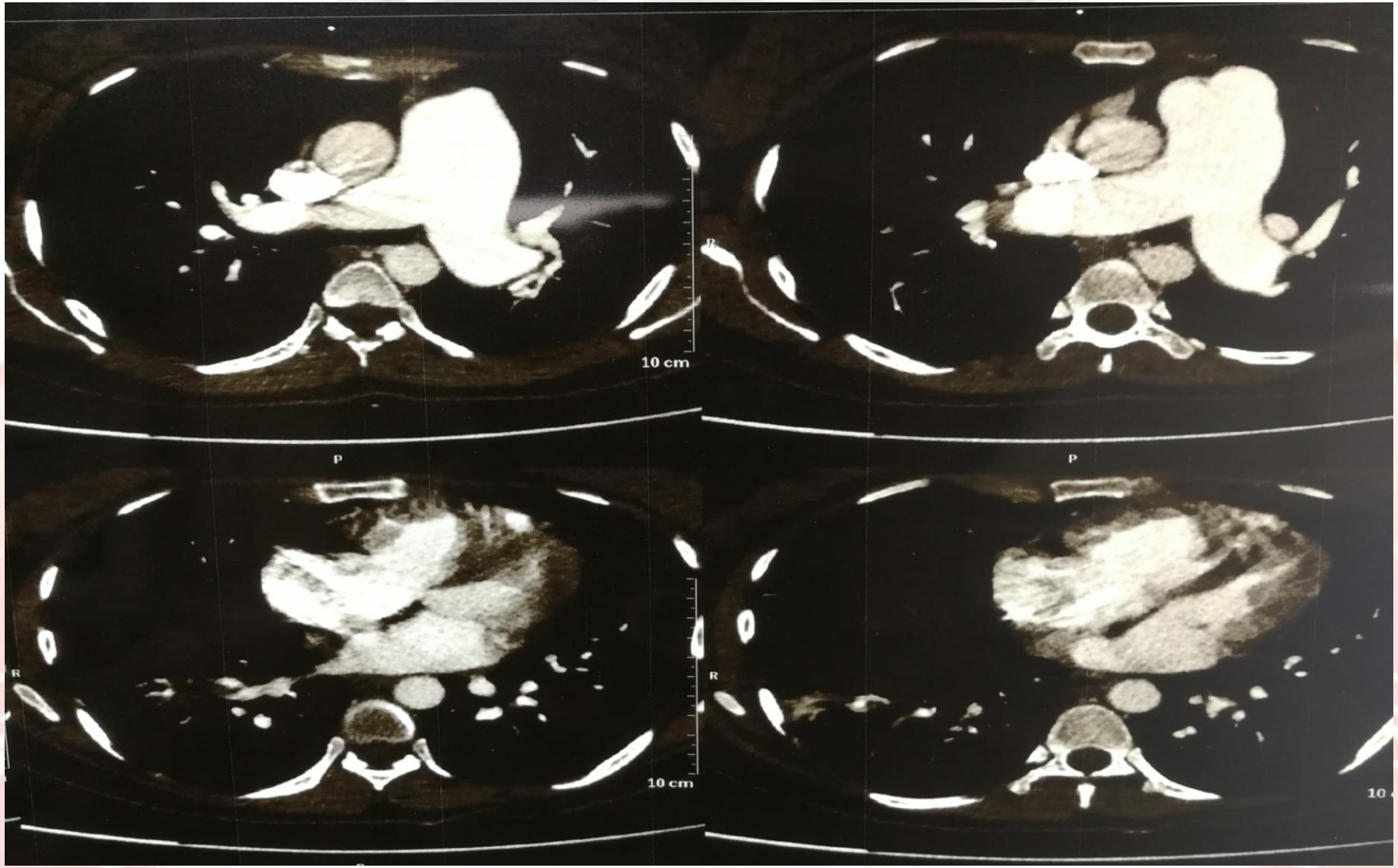
- LVEF - 60 %.
- **PASP 90-100 mmhg.**
- **RA / RV grossly dilated.**
- **RV hypertrophy present.**
- No evidence of clot/ embolism.
- No valvular abnormality.

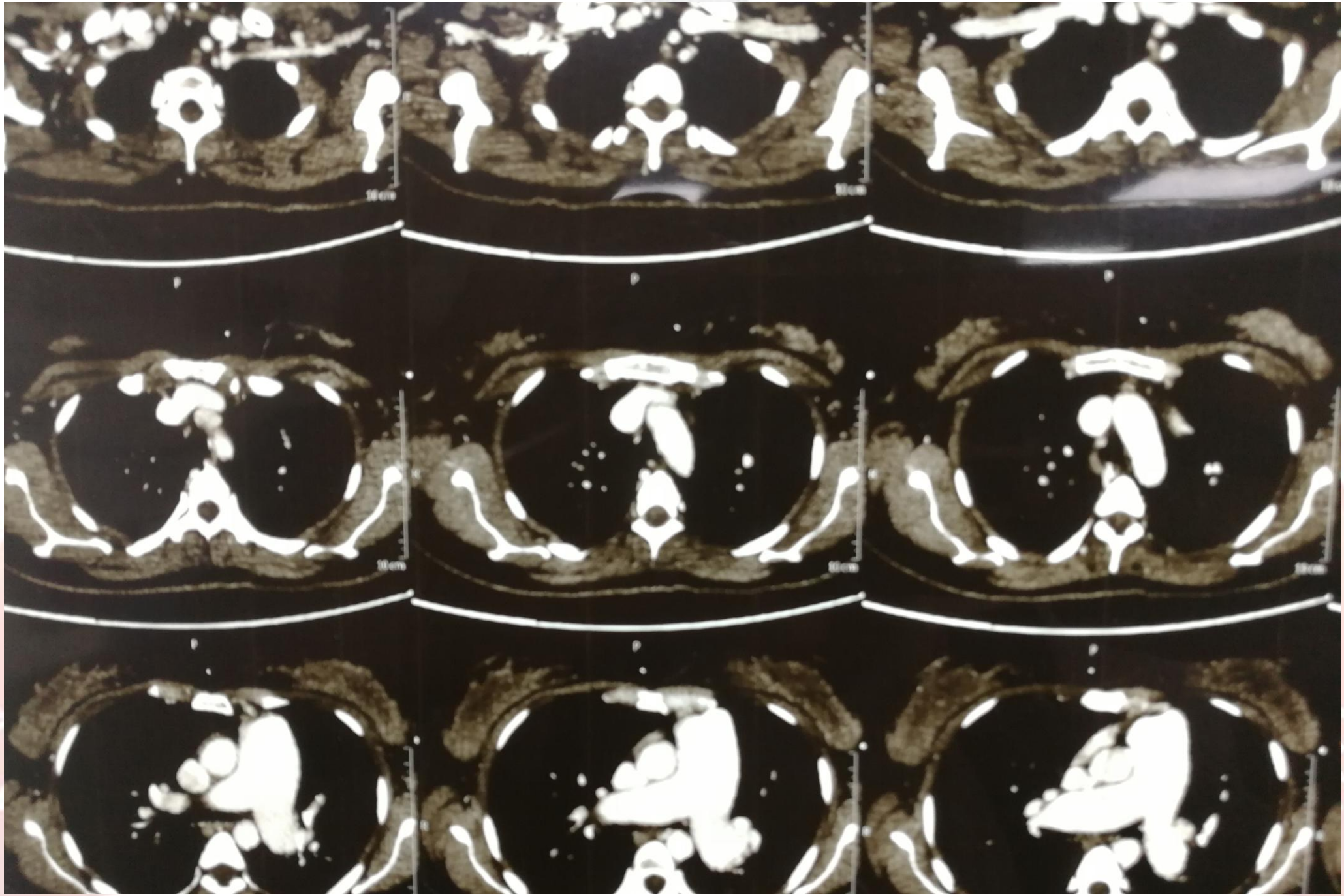
Lower limb venous doppler

- No evidence of DVT .

- Started on clexane.

CTPA - no evidence of pulmonary embolism.

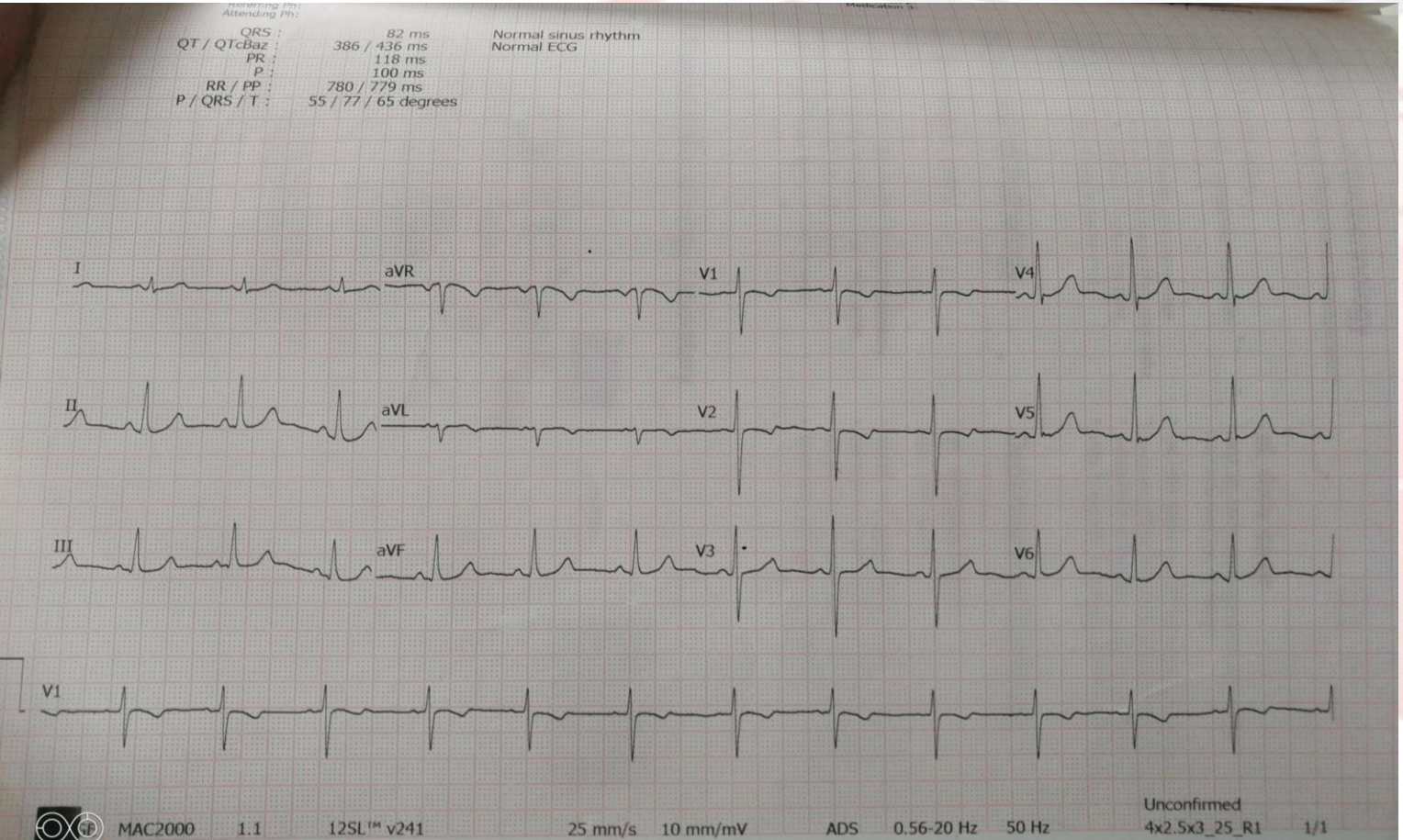




Palpitations : 2 nd month of pregnancy

2D ECHO

ECG



2D ECHO & COLOR DOPPLER

Levocardia, viscero-atrial situs solitus
Intact interatrial and Interventricular septum
Normally related great vessels
Normal pulmonary and systemic venous drainage
All cardiac chambers are normal sized
Normal Diastolic filling patterns
No regional wall motion abnormality
Mitral, Aortic, Tricuspid and pulmonary valves are structurally and functionally normal
No pulmonary hypertension
Left sided Aortic Arch / No COA
Normal pericardium

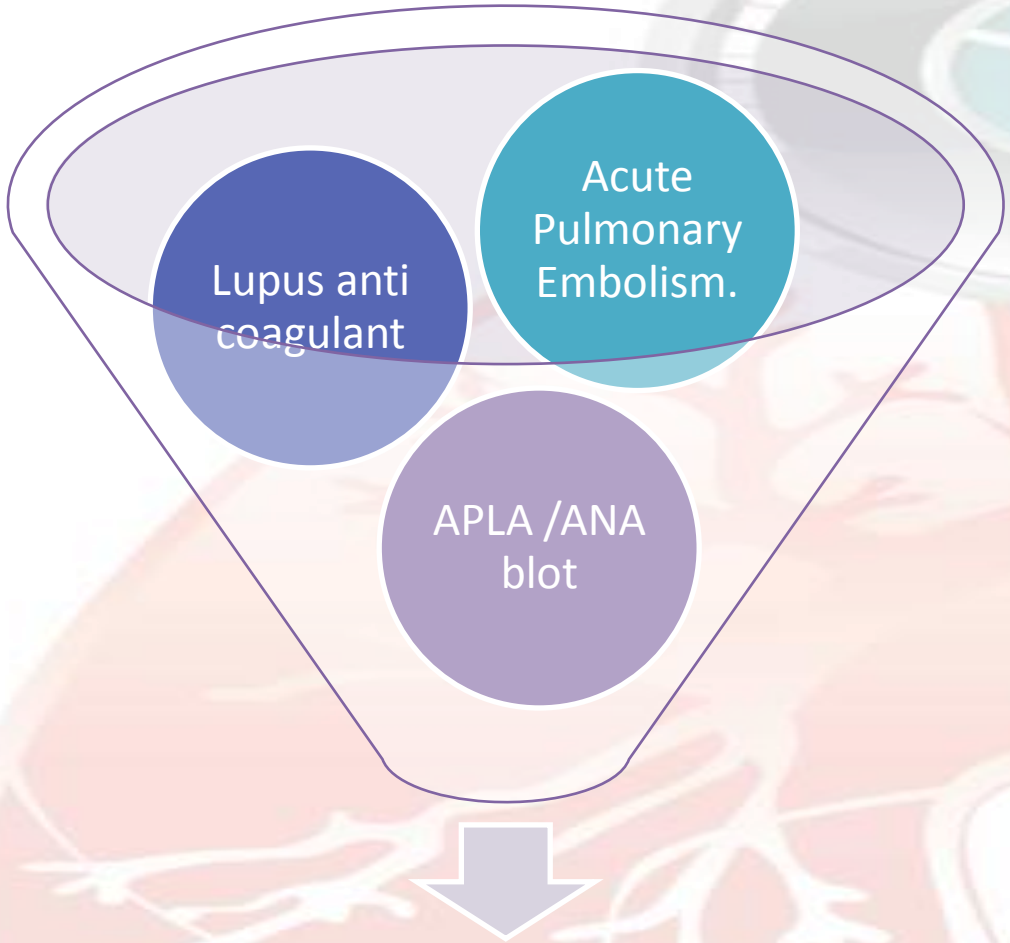
MEASURMENTS

M MODE	DOPPLER
Ao Diam	2.3 cm
LA Diam	2.6 cm
LA/Ao	1.15
Ao/LA	0.87
IVSd	0.8 cm
LVIDd	3.5 cm
EDV(Teich)	52 ml
LVPWd	0.7 cm
IVSs	1.1 cm
LVIDs	2.4 cm
ESV(Teich)	20 ml
EF(Teich)	62 %
%FS	32 %
LVPWs	1.1 cm

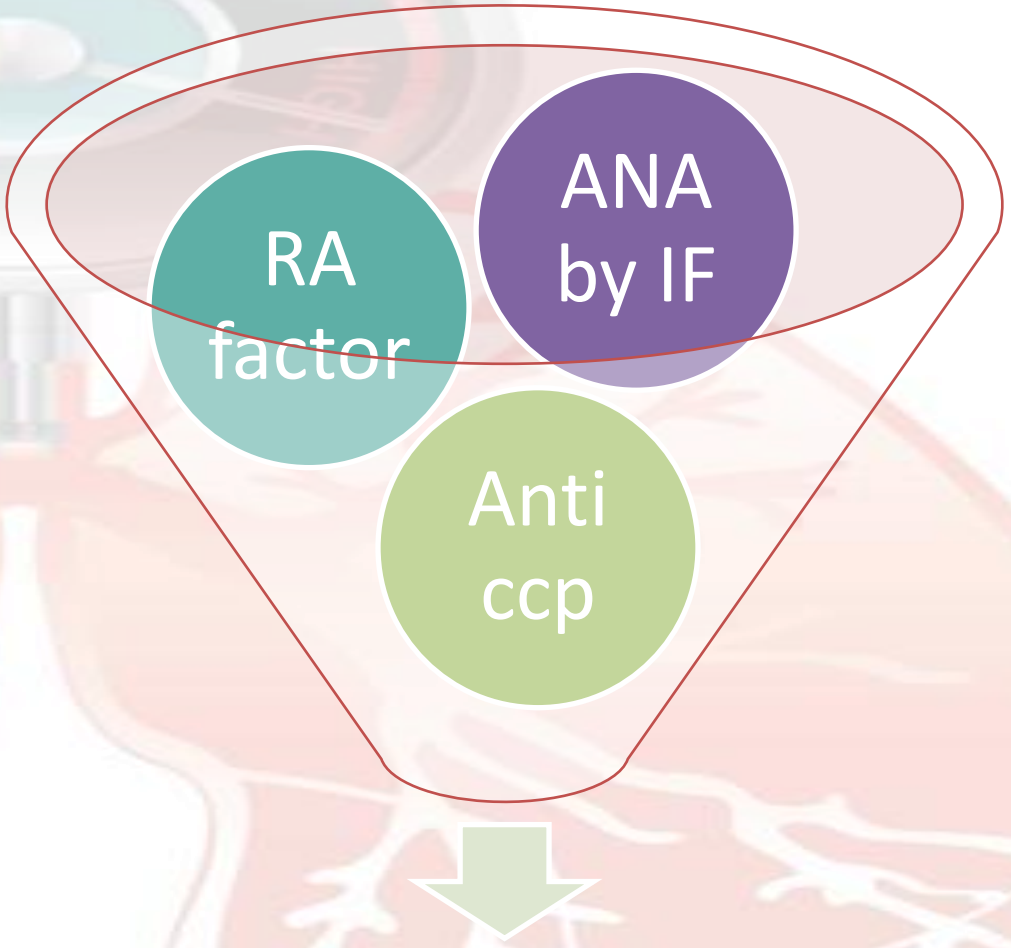
IMPRESSION

All cardiac chambers are normal sized
Normal diastolic filling patterns
No regional wall motion abnormality
Normal valves
Normal Biventricular function
No pericardial effusion/clots/vegetations
No pulmonary hypertension

Connective tissue workup



Negative



Negative

- Protein C normal
- Protein S - 35 (lower side) ➞ **S/O high risk of embolism**
- APCR-V ratio

- No portal hypertension.

USG abdomen

- Not done : severe pulmonary hypertension

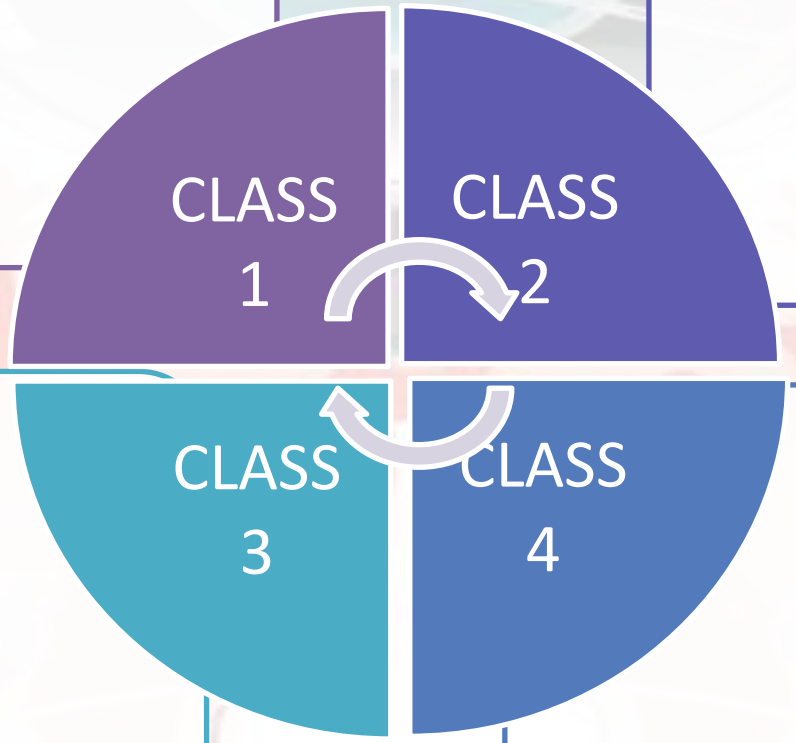
TEE

- Report awaited

Genetic mutation of BMPR2

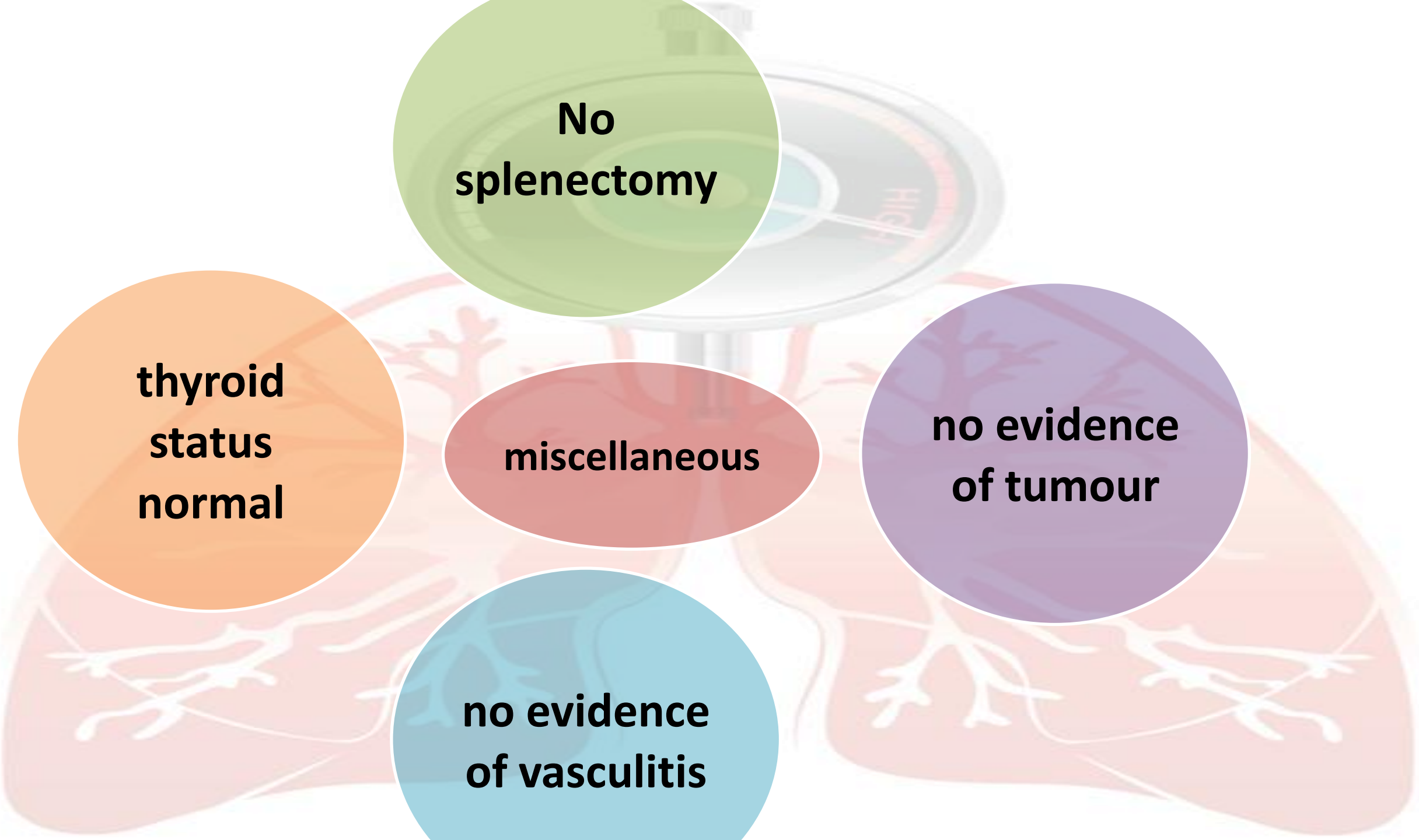
- BMPR2 , ALK -1, Endoglin mutation awaited.
- All CTD work up negative.
- HIV - non reactive
- No portal hypertension.
- No schistosomiasis.
- No signs of chronic hemolytic anemia

- to rule out ASD and other valvular heart disease.



- No evidence of any lung parenchymal disease

- No evidence of CTEPH .


No splenectomy
thyroid status normal
miscellaneous
no evidence of tumour
no evidence of vasculitis

- Started on tadalafil 20 mg OD .
- started on clexane 0.6 ml OD.
  - Developed rashes and drop in platelet count : clexane stopped.
- O2 tapered to NC 4L: spO2 - 92 %

Repeat 2-d echo after 1 week

RA/RV DILATED

PASP 112 mmhg, EF- 55-60 %.

Good RV function..

- A multi disciplinary approach was taken with obstetrician, cardiologist, pulmonologist.

- **Decision taken to continue pregnancy** as patient was not having any failure symptoms.

- monitoring NT-pro BNP , electrolytes and 2-D echo once in 5 days
- Tab macitent 10 mg added
  - Considering risk to benefit ratio
  - organogenesis period was completed.

DATE	ECHO - PASP	NT-PRO BNP
2/11	112	270
9/11	115	115
13/11	107	387
17/11	148	474
23/11	135	993

- Tab tadalafil 20 mg OD,
- macitentan 10 mg OD,
- digoxin 0.25 mg OD,
- Clexane 0.4 ml OD,
- Dytor 20 mg OD.

- Hemoptysis again at 32 weeks of gestation.
- O2 requirement increased to 15 L via venturi mask 50 %.

Hence decided to plan for LSCS

- **Explained the risk of sudden drop in PASP, pulmonary edema**
- **SOS need for ECMO.**

- Post LSCS, patient was stable.
- Her oxygen requirement reduced to 2 L via nasal canula.
- She required norad for 16 hours, tapered and stopped.

Post LSCS,

- V/Q scan showed low probability of embolism.
- Riociguat started
  - After cardiac opinion
- **Tab selexipag 400 mg od** , followed by 800mg tablet OD

Recent 2-D echo

- PASP - 90 mmhg
- Gross RA/RV dilatation present.
- Good RV function.

Baby details.

complete white out lungs, intubated, given surfactant, and extubated within 2 days, maintained on bottle CPAP for 1.5 weeks, followed by reducing FiO2 continously and progressively, taken on room air on 14 th day .

Baby had PDA , advised medical closure with sildenafil.

After 2 weeks, PDA closure done.

- Patient is on 2 L nasal o2, maintains spo2 of 96 %.
- Bp 100/60

LINE OF TREATMENT

- Oxygen , 1-2 L /minute.
- Diuretics - dytor 20 mg OD.
- Macitentan 10 mg OD.
- Selexipag 800 mg OD
- Riociguat 2mg TDS.
- Lanoxin 0.25 mg 1/2 OD for 6 days in a week.
- Ivabrad 5 mg 1/2 BD.
- Xarelto 15 mg OD.

- Pulmonary hypertension is associated with high mortality and morbidity risks for the mother. The risk is increased in all groups of pulmonary hypertension (1 to 5). Although women with severe pulmonary hypertension seem to be at higher risk, a safe cut-off value is not known.

- Pregnancy in women with pulmonary hypertension (PH) is known to be associated with significantly high morbidity and mortality rates, with an estimated mortality between 30% and 56%.
- The physiological changes that occur during pregnancy and the peripartum period are poorly tolerated.
- During pregnancy, an index of suspicion should exist for common conditions associated with pregnancy that can be complicated by PH, as these need to be evaluated thoroughly during this critical period.
- These include pulmonary and amniotic fluid embolisms, which are very common and mostly fatal. Most of the maternal PH-associated deaths occur during labor or within 1 month post-delivery.