The Paradox of Blocking and Breaking

Patient Introduction

Mrs. KS

28-year-old

Mother of one child

A house-wife

From Galle

Presenting Complaint:

Breathlessness for five days

Further History:

Acute onset and progressive since then

Associated with left sided pleuritic chest pain for last two days

Not associated with cough, fever

Not having ankle oedema, orthopnea or PND

No hemoptysis, No calf pain or swelling, No recent immobilization

Past history : pregnancy induced hypertension

Examination:

- Vitals: sats 98% on RA, BP 110/70, HR 104, RR30

- BMI 22
- No pallor/ plethora or jaundice
- No ankle or calf swelling
- Lungs Vesicular breathing with no added sounds
- Normal heart sounds

What’s going through your mind ??

1. Pulmonary Embolism
2. Pneumothorax
3. CAP/ pleural infection

Investigations

- FBC Hb 11.1

  WBC 21510 N 15250, L 5070, E 210

  Platelets 135

- ESR 32, **CRP 48**
- S creatinine 92, Na 144, K 3.8
- ALT 48, AST 37
- **APTT 46 s,** INR 1.2
- **Troponin I 128 (<19)**

- **ECG**

  Sinus tachycardia

- **CXR**

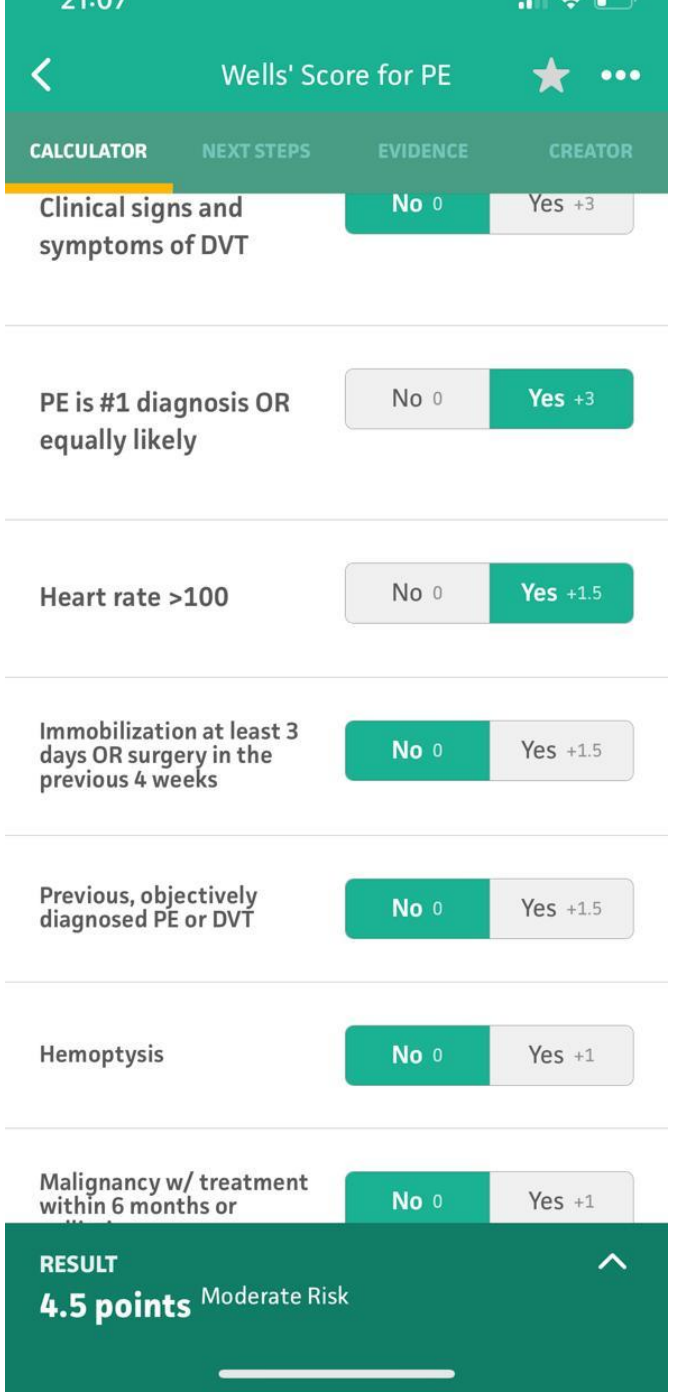
  No obvious abnormality

What is the next investigation?

1. CTPA
2. V/Q (perfusion) scan
3. D-dimer
4. LL Venous doppler
5. 2D Echo

Well's Score

- Clinical sings/symptoms of DVT
- **PE is number one diagnosis/equally likely**
- **HR >100**
- Immobile for 3 days/Surgery in the past 4 weeks
- Previous diagnosis of PE/ DVT
- Haemoptysis
- Malignancy with treatment within 6 weeks or palliative



CTPA or VQ Scan

- **VQ scan** –Less radiation to the breast tissue than CTPA (uses radionuclide)
  - No contrast nephropathy , allergy
  - Non conclusive in lung disease

- **CTPA** – Directly visualize the clot
  - Can see RV involvement
  - Detects alternative diagnoses

If CXR normal, stable patient- VQ scan if available

If known lung disease or CXR abnormal, unstable patient - CTPA

Suspected PE in Pregnancy ?

1. CTPA
2. V/Q scan
3. Neither

Radiation Exposure in Pregnancy

For the Foetus:

- From both CTPA, VQ : foetal exposure <1 mGy exposure-
- CXR foetal exposure- 0.0005–0.01 mGy- safe in all 3 trimesters
- No teratogenic risk or miscarriage risk (**50 mGy** teratogenic threshold)

For the Mother

- CTPA maternal breast dose 10-70 mGy
- VQ scan maternal breast dose 0.28mGy

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Suspected PE in Pregnancy

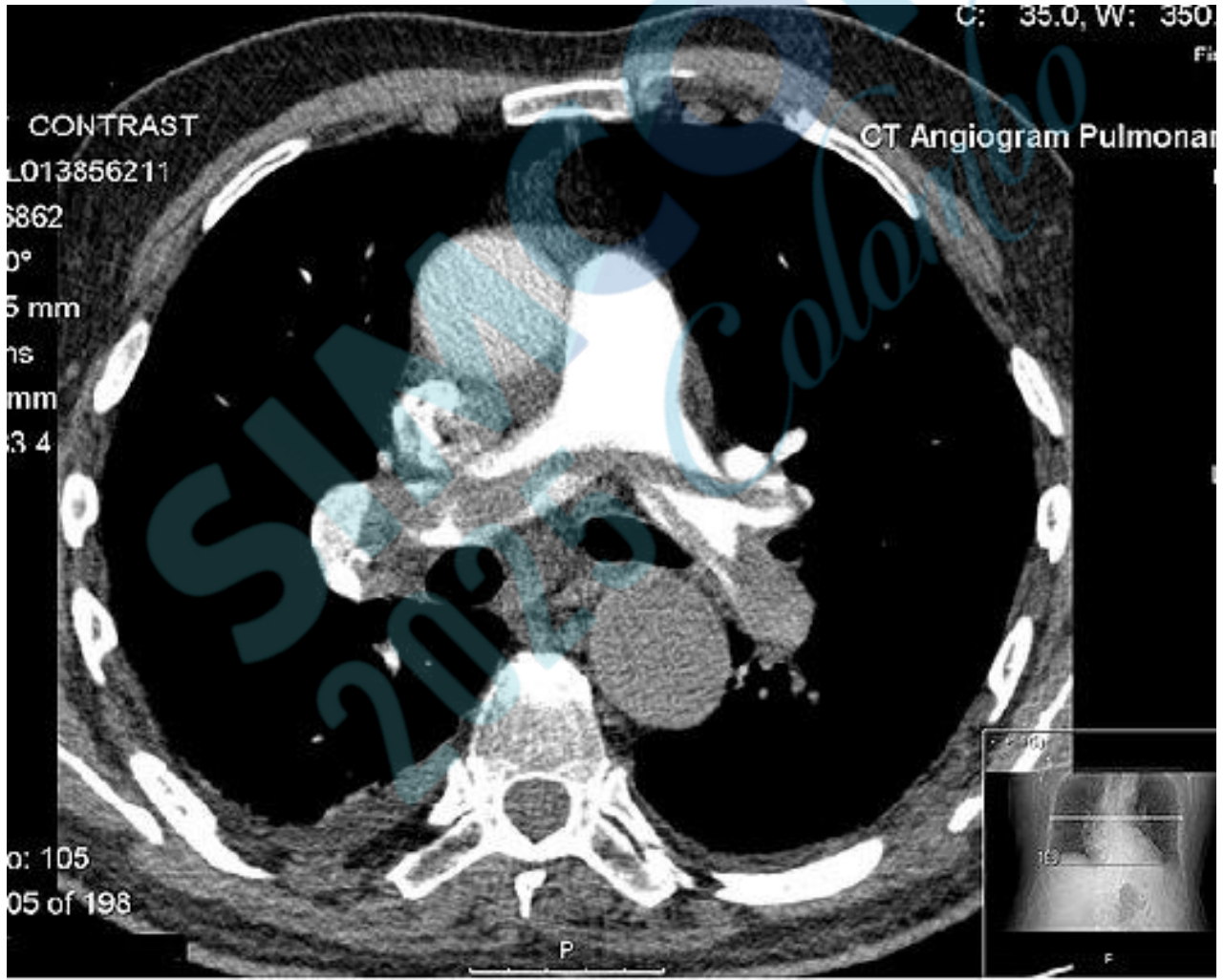
Same as a non-pregnant woman

- VQ if CXR normal and stable patient
- CTPA if CXR abnormal / known lung disease/ unstable

Back to our patient…….

CTPA

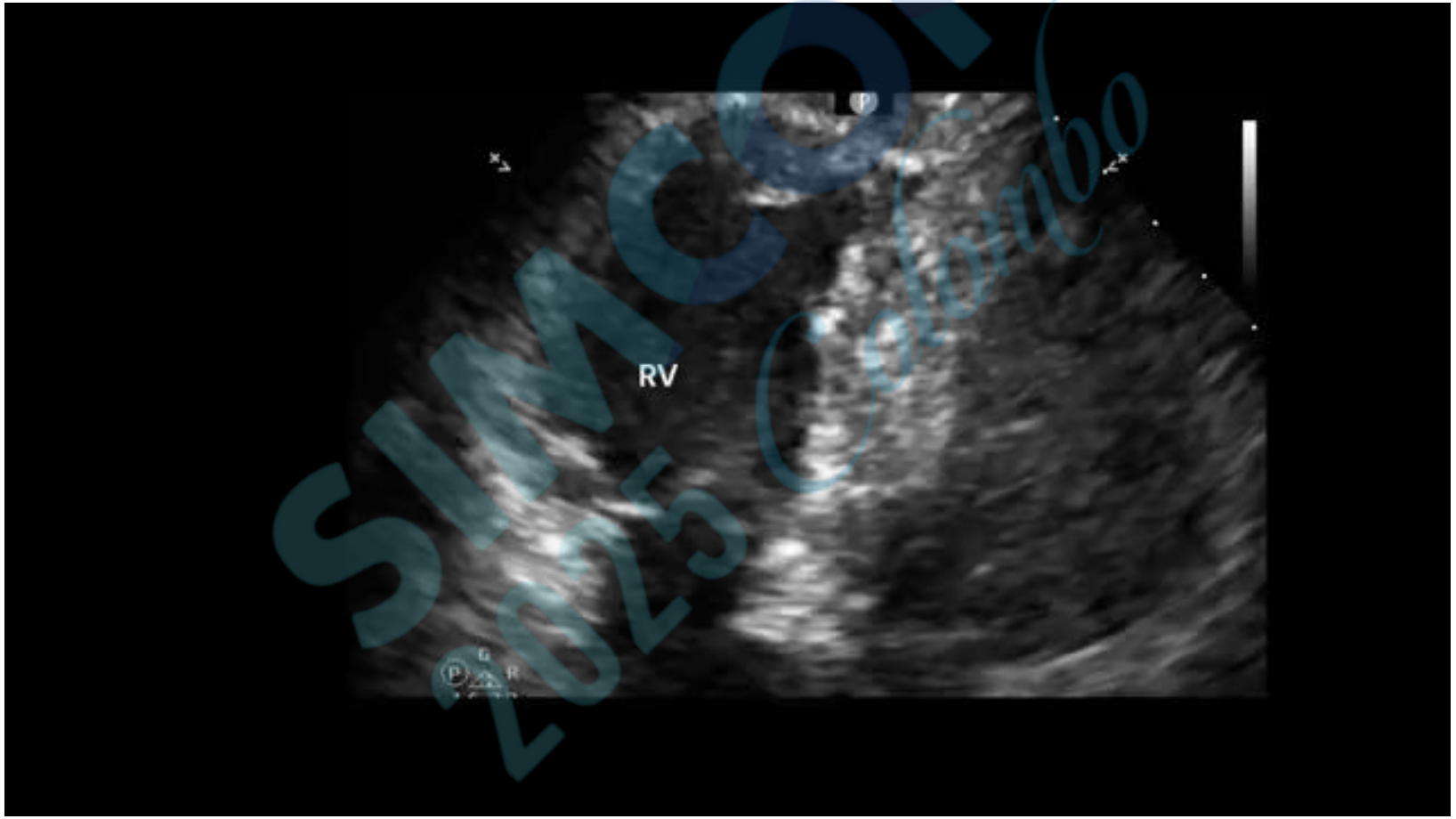
Pulmonary emboli in both main pulmonary arterial branches



Lower Limb Venous Doppler

Extensive DVT extending from R/ external iliac to R/ posterior tibial veins

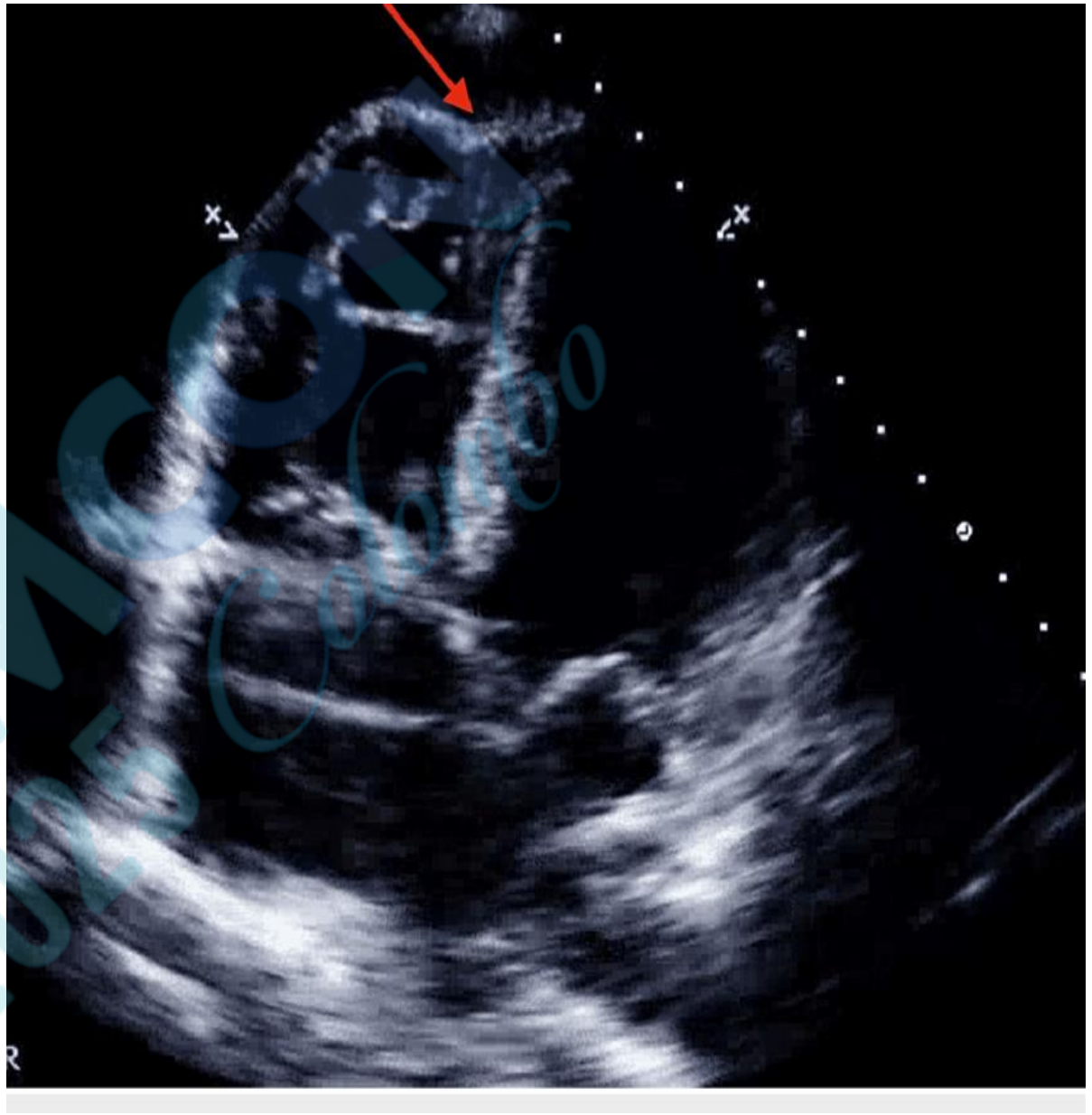
2D Echo



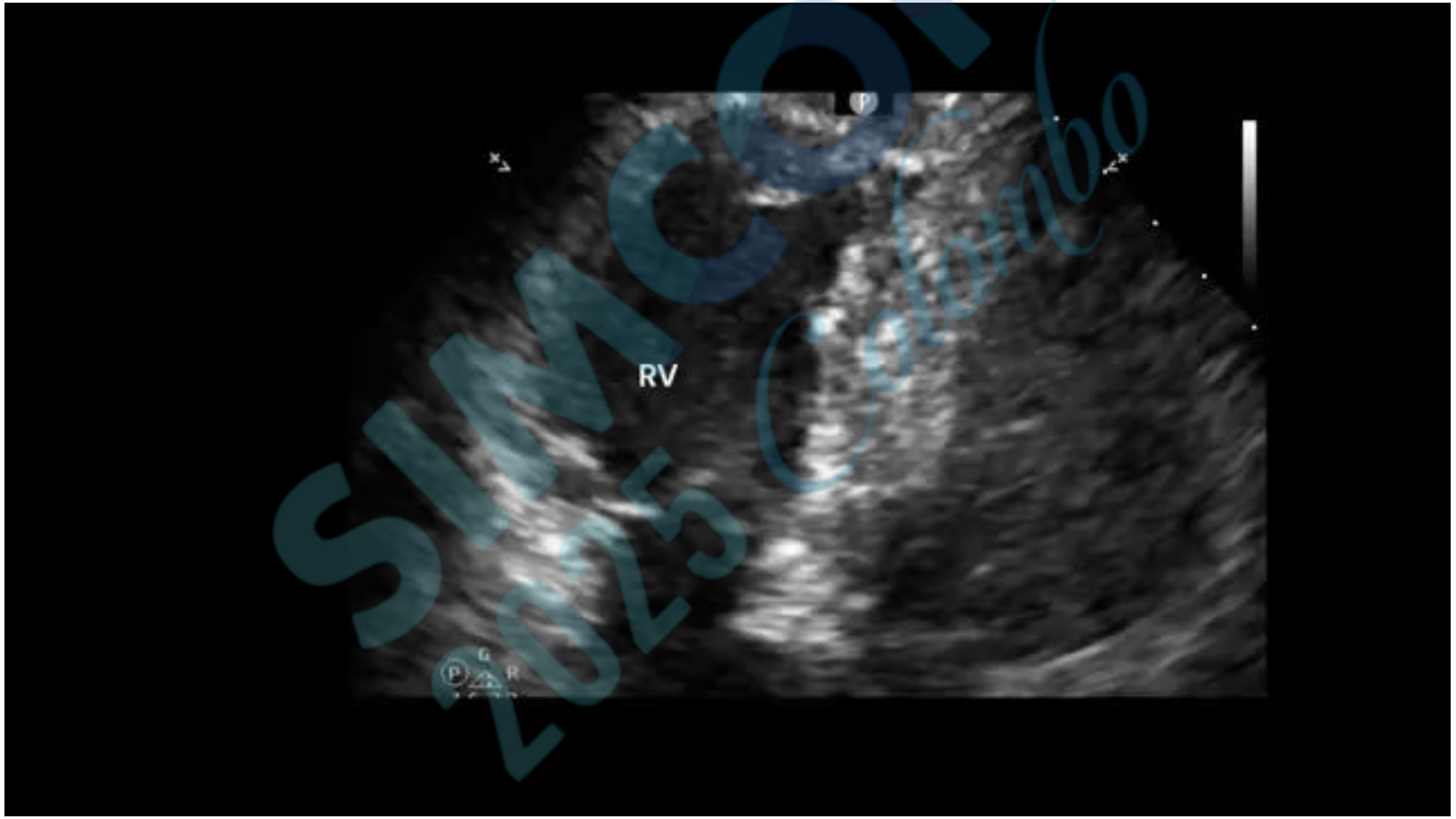
McConnell's sign
(Akinesia of the mid-free wall and hypercontractility of the apex)

Dilated RA/RV

Preserved LV function



2D Echo



Management

- Hemodynamically stable –Not a massive PE (not for thrombolysis)
- RV strain/ myocardial injury was present- **Submassive PE**

consider mechanical thrombectomy If feasible (MDT Decision) .
otherwise -anticoagulation

Underlying cause ?

PE + Mild thrombocytopenia + Prolonged APTT

Anti-Phospholipid syndrome

Anticardiolipin Antibodies :

IgM negative

IgG positive

Anti Beta 2 Glycoprotein Antibodies:

IgM negative

IgG positive

Lupus Anticoagulant:

Should be done >12weeks after the of thrombotic event

Should be done ideally off anticoagulants

Antiphospholipid Syndrome

- **<u>Diagnosis - Sydney criteria:</u>**

Clinical- 01:

- **Thrombosis:** ≥1 arterial, venous, or small-vessel thrombosis
- **Pregnancy morbidity:** ≥1 unexplained fetal death (>10 weeks), ≥3 early miscarriages (<10 weeks), or premature birth <34 weeks due to placental insufficiency

Laboratory- 01

- Presence (on ≥2 occasions ≥12 weeks apart) of at least one: LA, aCL ab, Anti β_2GPI ab

Predictors of Thrombosis

- LA positivity is the **strongest predictor of thrombosis**
- LA + aCL + β_2GPI = **high-risk "triple-positive" APLS**

- IgG aCL and IgG β_2GPI have **stronger correlation with thrombotic events** than IgM
- High-titer - stronger association with thrombosis and obstetric complications.

Management- Which anticoagulation ?

1. Warfarin with enoxaparin bridging
2. Enoxaparin alone
3. UFH
4. DOAC

Trial of Rivaroxaban in AntiPhospholipid Syndrome (TRAPS): Two-year outcomes after the study closure

Vittorio Pengo et al. J Thromb Haemost. 2021 Feb.

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Abstract

Background: Trial of Rivaroxaban in AntiPhospholipid Syndrome was a prospective randomized, open-label, noninferiority study conducted in 14 centers in Italy. Rivaroxaban

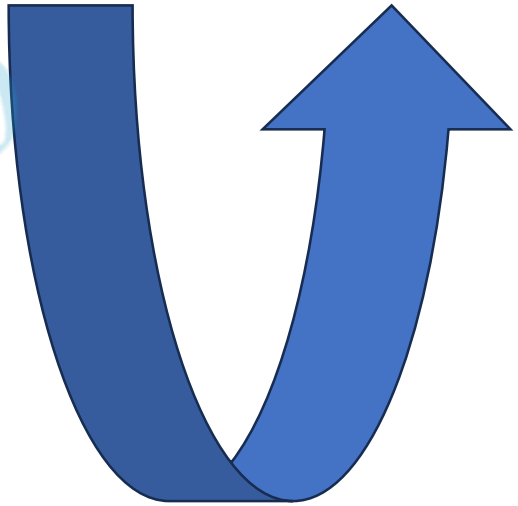
Warfarin for triple positive, arterial thrombosis, recurrent VTE

Treatment

- Patient was started on warfarin with enoxaparin as bridging therapy

Day 7 of the Admission

- Fever , generalized weakness
- Progressive breathlessness
- Pallor and tinge of icterus noted
- No bleeding manifestation



Investigations

FBC

- **Hb 7.1 (MCV 96)**
- WBC 14 000
- **Plt 33 000**

- ESR 66
- CRP 90
- S. creatinine 69
- SE-normal
- AST/ALT normal

- Bilirubin Total 36 µmol/L (5-17)
- Direct 10 µmol/L
- **Indirect 26 µmol/L**

LDH 668 U/L (140-280)

Blood picture

- Normocytic normochromic RBC, no fragmented RBC, few polychromatic, few spherocytes
- mild neutrophil leukocytosis
- thrombocytopenia with large platelets

- Retic index 5.3%

Differential Diagnosis

1. Catastrophic APLS
2. Evans Syndrome with APLS
3. Evolving SLE with APLS
4. Sepsis with DIC
5. Heparin induced thrombocytopenia
6. Other ?

ANA Panel

- Negative

Microbiology

- HIV negative
- Hep C Ab negative
- EBV/ CMV negative
- Mycoplasma negative
- Blood cultures- negative

Direct Antiglobulin (Coombs) Test

- IgG negative
- C3d positive

Catastrophic APL Syndrome

- Rapidly progressive, multisystemic thrombotic microangiopathy caused by widespread small-vessel thrombosis in APLS
- Occurs in <1% of APLS patients, but mortality 30–50%

CRITERIA:

- 1. Involvement of ≥3 organs, systems
- 2. Development of manifestations in <1 week
- 3. Histopathologic evidence- small vessel occlusion without vasculitis
- 4. Laboratory confirmation of aPL syndrome

Evans Syndrome

- **Autoimmune hemolytic anemia** and **immune thrombocytopenia** with or without **autoimmune neutropenia**.

- Can be primary or secondary (e.g. SLE, APLS, HIV, Mycoplasma)

- IgG mediated RBC destruction and platelet destruction
- **DAT – positive for IgG**

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Likely Diagnosis

Evans syndrome variant secondary to APLS

- Evidence of autoimmune hemolysis and thrombocytopenia with aPLS
- No DIC on blood picture
- DAT positive: C3d+. IgG –
- ANA negative

Management of our patient

- Therapeutic plasma exchange – 6 cycles
- Methyl Prednisolone 1000mg IV for three days-> prednisolone 1mg/kg

- Rituximab- (anti CD20 on B cells -> B cell lysis -> reduce complement activation)

Practical Takeaways

1. Use of pre-test probability scores in evaluating PE
2. Rational use of imaging in young women / pregnancy
3. Look out for complications initiate early treatments like PLEX
4. Need for Multidisciplinary care


THANK YOU