



# HEMATOPOIETIC & LYMPHATIC SYSTEM

-HAyat BATCH-

SUBJECT : Clinical Medicine

LEC NO. : 1

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وَقُلْ رَبِّ زِدْنِي عِلْمًا

يعطيكم العافية دفعة وريد؛ هاد التفريغ حيكون شامل لكلام  
الدكتور و النوتات الي ركز عليها مع بعض الشروحات  
الخارجية لتفهمكم بعض المواضيع  
بالتوفيق 🤲 و بتمنى تدعولي 🙏

بنهاية الملف حتلاقوا كويز صغير مو غلط تختبروا حالكم  
فيه 🤲



#النادي\_الطبي  
#معكم\_خطوة\_بخطوة

## VENOUS THROMBOEMBOLISM- VTE-

### VENOUS DISEASES INCLUDE THE FOLLOWINGS

- 1-DEEP VEIN THROMBOSIS-DVT-.
- 2-SUPERFICIAL THROMBOPHLEBITIS.
- 3-VARICOSE VEINS
- 4-CHRONIC VENOUS INSUFFICIENCY.

#### Extra information:

\*Deep vein thrombosis (DVT) is a medical condition that occurs when a blood clot forms in a deep vein

\*Superficial thrombophlebitis is an inflammation of a vein just below the surface of the skin, which results from a blood clot

\*Varicose veins are swollen and enlarged veins that usually occur on the legs and feet.(الدوالي)

\*Chronic venous insufficiency occurs when your leg veins don't allow blood to flow back up to your heart. Normally, the valves in your veins make sure that blood flows toward your heart. But when these valves don't work well, blood can also flow backwards.



## CARDINAL SYMPTOMES OF VENOUS DISEASES

هدول هم ال symptoms الي لو اجاني المريض  
فيهم عطول بفكر ب DVT

1-LEG PAIN

2-LEG SWELLING

3-LEG DISCOLOURATION-  
PIGMENTATION

4-LEG VENOUS ULCERATION



due to the deposits of hemosiderin which is a pigment formed due to the breakdown of the proteins (hemoglobin) in your blood. The skin gradually turns brown, red, or takes on a bronze color.



Leg swelling above and below the knee, due to a venous thrombosis above the knee



Leg swelling below the knee, due to a venous thrombosis below the knee



Browny Pigmentation because of hemosiderin deposition and it is chronic



Leg venous Ulceration

طيب طيب، قبل ما نبدأ بالسلايدات، بدي اشرح لكم شوي بعض الشغلات المهمة  
لحتى تتخيلوا السيناريو :

اجاك مريض عالطوارئ و معاه ال cardinal signs الي حكيهاهم فوق؛ أول احتمال بدك  
تفكر فيه هو DVT طيب كيف بدي اتأكد اذا احتمالي صح ؟ ولو كان صح كيف بدي  
اقيس مدى خطورة الوضع عند المريض لاحدد طريقة العلاج ؟ هاد الشي حنحكي عنه  
بالسلايدات الجاية  
خلي ببالكم إنه برحلتنا بالعلاج حنمشي على هدول الخطوات (مهمين) :

## DVT APPROACH :

مهم جداً

1- Are the cardinal symptoms presented?

2- Is the swelling above or below the knee? وين موقع الانتفاخ ؟

3- Is there a Pulmonary Embolism? حأشرحها تحت

4- Exclude the differential by history taking and examination

خلي ببالكم انه الاعراض الي حكيهاها مو بس لل DVT لهيك بدي ابدأ احدد شو صاير  
مع المريض لاحدد السبب الحقيقي للاعراض

5- Use (Well Score) to determine the possibility of DVT

سكور بستخدمه لأعرف الشدة و الخطورة تبعت ال DVT لو اتأكدت انها هي السبب  
بالاعراض

6- Search whether it is provoked or non-proveked (RISK FACTORS)

هل الجلطة الها محفز واضح او لا ؟

7- Investigations الفحوصات

8- Treatment and Prevention العلاج و الوقاية



### Note that:

The most serious complication of DVT happens when a part of the clot breaks off and travels through the bloodstream to the lungs, causing a blockage called **pulmonary embolism (PE)**.



انت كطبيب عشو لازم تنتبه لما المريض  
ييجيك بال cardinal symptoms

## COMMON CLINICAL PRESENTATION

- DVT of the leg with or without pulmonary embolism-PE.
- DVT- depending on the SITE of venous thrombosis  
May be below the knee joint or above the knee –  
ILA - FEMORAL- PROXIMAL DVT.

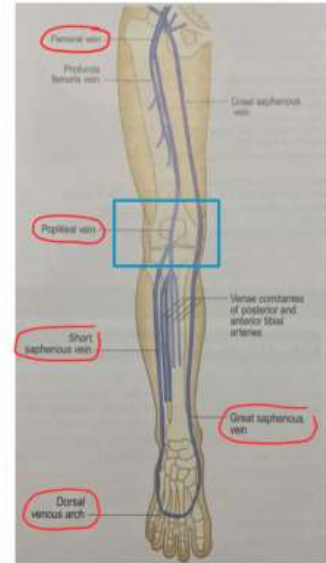
### ● OCCLUSIVE- DVT- مهم نقارن بينهم

presented classically with  
① WARM leg and ② painful SWELLING with  
③ superficial veins DILATATION typically unilateral

لو كانت Bilateral بتكون المشكلة كثير اكبر من  
DVT، هون يفكر بال heart و kidney و liver  
مممكن يكون فيهم failure

### ● NON-OCCLUSIVE -DVT

which carries high RISK due to massive PE-  
in this case the leg may be normal on examination



\*\* So if the patient came with the previous cardinal signs, I should check :

### 1- The site of DVT :

- \* above the knee (proximal) : femoral vein
- \* below the knee (distal) : popliteal vein

Note that the proximal veins obstructions are more sever.

### 2- If there is a PE (cough, shortness of breath,...etc)

### 3- Is it occlusive or not :

- \* If it was occlusive : warm,swell,painful unilateral leg
- \* non-occlusive : no swelling, no warm, no pain, but high weight of the leg with massive PE

## DIFFERENTIAL DIAGNOSIS

هون بحكيلنا عن الحالات المحتملة غير ال DVT و الي لازم انتبه الها لأشخص صح

### 1-Infective cellulitis-

site of infection - marked skin erythema - well demarcated area - fever

→ (-) Bacteria

### 2-Baker's cyst ruptured - SYNOVIAL FLUID

KNEE JOINT SWELLING - RA- OSTEOARHRITIS

بكون عندهم rheumatoid arthritis الي حتكون أكياس خلف الركبة ، لو كان المريض معه التهابات مزمنة بالمفاصل ما بفكر ب DVT لهيك ضروري اوخذ هستوري منه

### 3-Superficial venous thrombophlebitis → not deep

### 4-Arterial occlusion-peripheral vascular disease

ischemic LEG- painfue- cold and pale atrophic changes- GANGREN- DM--HTN SMOKER.

ضروري نميز بين ال arterial و venous: ال arterial يكون سببها كبير زي MI او ischemia هسا هون ما بصير عنا swelling و warm لو المريض اجى معه سكري، ضغط، مدخن، عنده غرغرينا مع الم و برودة و atrophic changes بفكر ب Arterial مو venous حتى كمان ما بقدر الاقي pulse

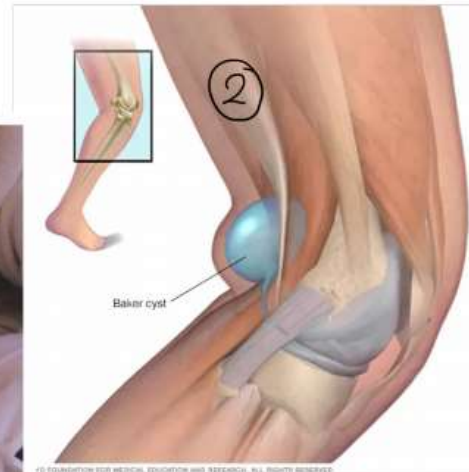
### 5-Calf muscle tear- hematoma -

post-trauma- or may spontaneous.

زي شرطي المرور الي بضل واقف او الي بلعبوا رياضة



الصور خارجية فقط للتوضيح





## DIAGNOSIS OF DVT

### Wells SCORE

- 1-ACTIVE CANCSR-1
- 2-PARALYSIS- 1
- 3-BEDRIDDEN for 3 days or more – 1
- 4-CALF swelling at least > 3cm  
as compared with normal leg- 1
- 5-PITTING OEDEMA UNILATERAL – and  
superficial vein dilatation- 1

DVT-low probability <1

DVT-moderate probability 1-2

DVT-high probability >2



الWELL SCORE هو سكور عليه علامات و مجموعة اسئلة بسألها للمريض لحتى  
اعرف احتمالية اصابته ب DVT  
فبسأل المريض لو معه حاليا سرطان ولازم يكون اكتيف مش انصاب زمان و تعالج منه  
و بسأل لو المريض معه شلل بالقدمين  
و بسأل لو المريض صار له اكثر من 3 ايام مو متحرك  
و بقارن قطر الرجلتين و لو كان الفرق بينهم اكثر من 3 سم  
و بشيك على ال pitting edema



نبحث عن ال risk factor لنعرف  
اذا هي induced او لا

# RISK FACTORS

## Provoked- or non provoked

- 1-Venous stasis- CONGESTIVE -HF- SLEEP APNEA SYN.-obesity
- 2-Immobilization- trauma- CVA- paralysis-
- prolonged bed rest- recent long travel مهم
- 3-Old age - dehydration => دم لزج
- 4-Vasculitis- YOUNG PT. -SLE- lupus anticoagulant-
- ANTI-PHOSPHOLIPIDS- SYNDROME- BEHCET S DISEASE  
↳ genital + oral ulceration.
- 5-Nephrotic syndrome
- 6-Inflammatory bowel disease- IBD.
- 7-Pregnancy- perperitum مهم
- 8-Contraceptive pills مهم
- 9-Thrombophilia مهم
- positive family history of DVT-
- protein-C- and S- factor V- deficiency- → natural anti-coagulation.
- 10- Homocystinaemia
- 11-Polycythemia rubra vera- hyper-viscosity syn.
- HYPERCOAGULABLE STATE بدور العمليات كمان
- 12-Malignancy
- 13-ORTHOPEDIC-procedure or surgery- hip –  
knee-replacement
- 14-POST-OPERATIVE- RECENT SURGERY مهم

خلي بيالنا انه أهم ثلاث اسباب بتعمل عنا DVT هي :

- 1- Venous stasis
- 2- Vascular Injury
- 3- Hypercoagulability state

لو اجاني شب عمره 20 بدور عال vasculitis , لو بنت بدور عال pregnancy و حبوب منع الحمل  
بسأل كمان عن العمليات و بسأل عن اي مرض صابهم و عن ال family history عشان  
ال thrombophilia

## INVESTIGATIONS

COMPRESSION DOPPLER-U/S

MRV

INVESTIGATE THE UNDERLYING RISK FACTORS

الفحوصات التي يطلبها من المريض.

١. الترا ساوند بساعدنا نعرف اذا هي occlusive او لا

٢. الرنين المغناطيسي

٣. تشيك عال risk factors

## COMPLICATIONS OF DVT

A- LOCAL COMPLICATIONS POST-THROMBOTIC SYN.

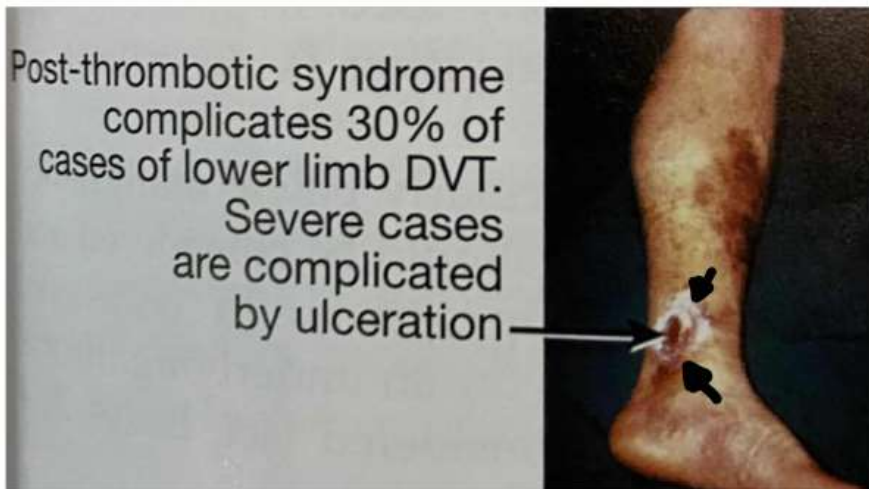
1-CHRONIC VENOUS LEG ULCER

2-POST-DVT-CHRONIC UNILATERAL LEG OEDEMA

3-CHRONIC VENOUS INSUFFICIENCY- LEG

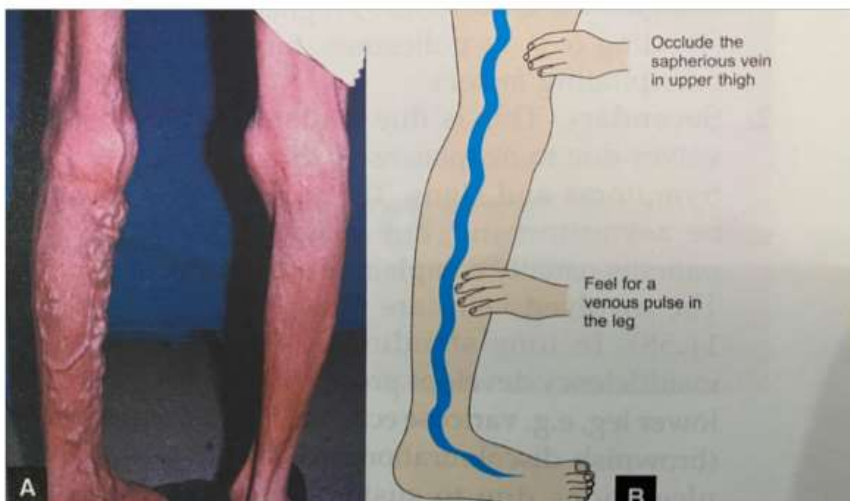
PIGMENTATION- HEMOSIDERIN DEPOSITION

الدكتور اهتم بال complications تبعون DVT كثير ، و حتى قسمهم ل local و systemic  
هدول المرضى رجلهم بتضل منفوخة و مليئة بالسوائل و ثقيلة و متصبغة باللون البني مع وجود  
تقرحات و حتى ممكن يصيبهم الدوالي (varicose)  
اما ال systemic فبصير معهم pulmonary embolism الي حن فصل عنها كمان شوي



This picture shows post thrombotic syndrome thr shows :

1. Medial Ulceration
2. Unilateral leg edema
3. Pigmentation
4. Swelling



This picture shows  
Varicose (chronic)

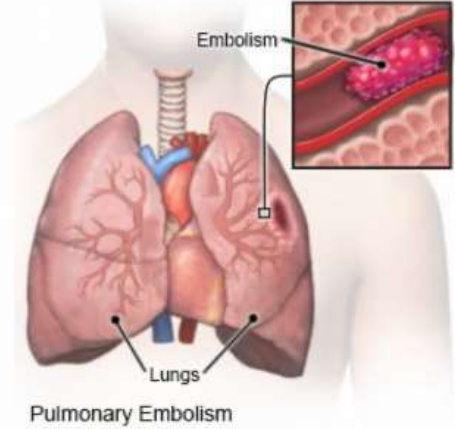


## \*The second complication of DVT:

### B- PULMONARY EMBOLISM-PE-

## الجلطة الرئوية

- Serious and fatal complication of DVT-  
high index of suspicious
- COMMONLY – PE-presented after  
NON - occlusive- DVT-
- Proximal ila -femoral –DVT-  
emboli may dislodge and embolise  
into pulmonary artery system .
- Effected lung segment will be ventilated  
but not perfused resulting in alveolar  
collapse ventilation-perfusion mismatch  
HYPOXIA, VASOCONSTRICTION, ischemia



التي بصير هون كالتالي ، في عنا veins كبيرة لدرجة انه ما صار الها occlusive  
زي proximal ila و femoral ، بعد فترة يتم طرد ال thrombus من هدول ال veins ل  
pulmonary artery على شكل emboli, و سيكون الها مجموعة  
complications خطيرة

\*The pulmonary arteries function to transport deoxygenated blood  
from the right side of the heart to the lungs for oxygenation.

لتحت حنكي عن أنواعها الثلاثة، من الأخطر الى الأقل خطورة (مهمين عليهم  
سؤال) و شو الفحوصات و العلاجات التي بنطبقها

Clinical presentations of -PE-

varies depending on NUMBER - SIZE- SITE-  
of pulmonary emboli

## ACUTE MASSIVE-PE- MEDICAL EMERGENCY

- Occlusion of **MAIN** pulmonary artery by **BIG EMBOLI** dislodged from DVT.
- Patient will be presented with
  - 1 sever crushing central chest pain –
  - 2 <sup>shortness of breath</sup> sever- SOB – **HYPOXIA**-
  - 3
  - 4 Hemodynamic instability **SEVER**- hypotension-
  - 5
  - 6 low cardiac output- **SHOCKED**-and **COLLAPSED**.
  - 7
  - 8 **ACUTE RV-HF-failure** –high JVP-tachycardia-
  - 9

↳ jugular venous pressure-

- \* Medical emergencies
- \* very dangerous
- \* ↑ mortality rate.

↳ He usually die.

## ACUTE SMALL /MEDIUM-PE

- Occlusion of **peripheral segmental** pulmonary artery by emboli - dislodged from DVT
- Pt. Usually **STABLE**-
- Presented with **pluretic chest pain**- **SOB**- **pulmonary infarction**- **hemoptysis**- **sinus tachycardia**-hypoxia.

بند حفظ ما عند ههم :-

1. unstable hemodynamics
2. Severe SOB

## CHRONIC-RECURRENT -PE-

Chronic recurrent occlusions of pulmonary microvasculature- by **small emboli** from DVT

PT. will be presented – **PUL. HTN**-**RV-HF**-

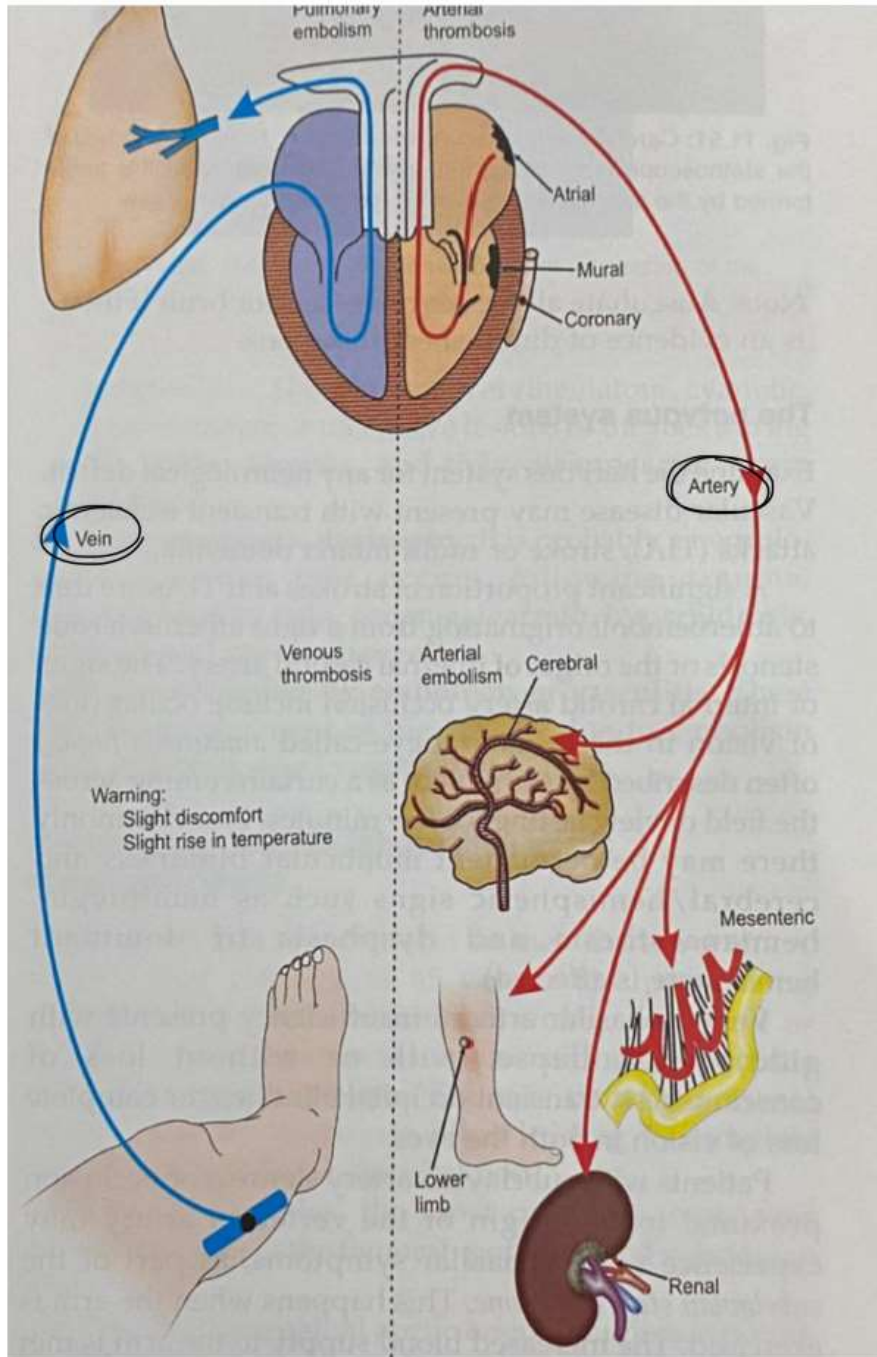
**HIGH** –JVP- **EXERTIONAL dyspnea**- **ANASRCA**.

\* بيحلي المريض بعد سنوات

↳ ضيق النفس الجريب

↳ general swelling in the whole body.





الدكتور رجح أكد على فكرة انه نعرف الفرق بين  
arterial and venous thrombus

## Investigations

### 1. Chest X-ray :-

linear atelectasis,  
blunting of costo - phrenic angle-  
plural effusion  
raised hemi- diaphragm ,  
wedge shaped pulmonary infarct,  
abrupt cut-off of a pulmonary artery or  
translucency of an under-perfused  
distal lung zone

### 2. ECG :- usually normal

sinus tachycardia, atrial fibrillation ,  
right ventricular strain  
( S1,Q3,T3) pattern is rare

### 3. Blood tests :-

WBC- leucocytosis,  
elevated ESR,CRP-  
increased LDH level- D-DIMER positive

هنا نقص  
↓ ٣٦

### 4. Radionuclide

ventilation/ perfusion scanning

### 5. Ultrasound scanning – DOPPLEX-

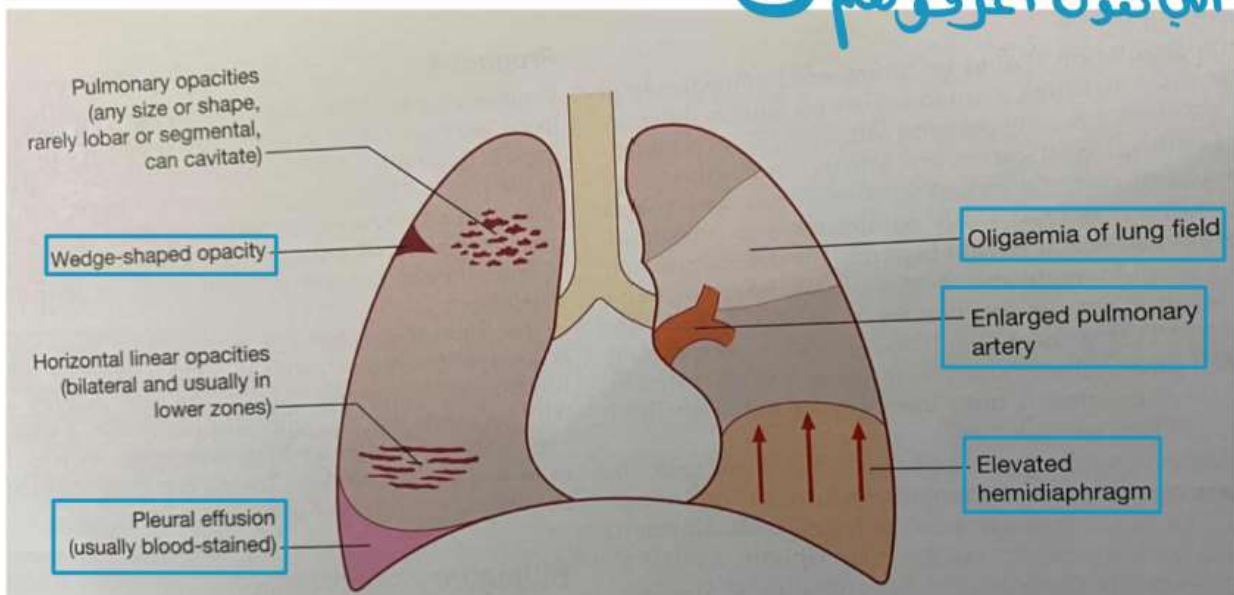
pelvic vein or lower limb  
Ila -femoral – popliteal veins

### 6. HIGH RESOLUTION- CT ANGIO- scan- DIAGNOSTIC

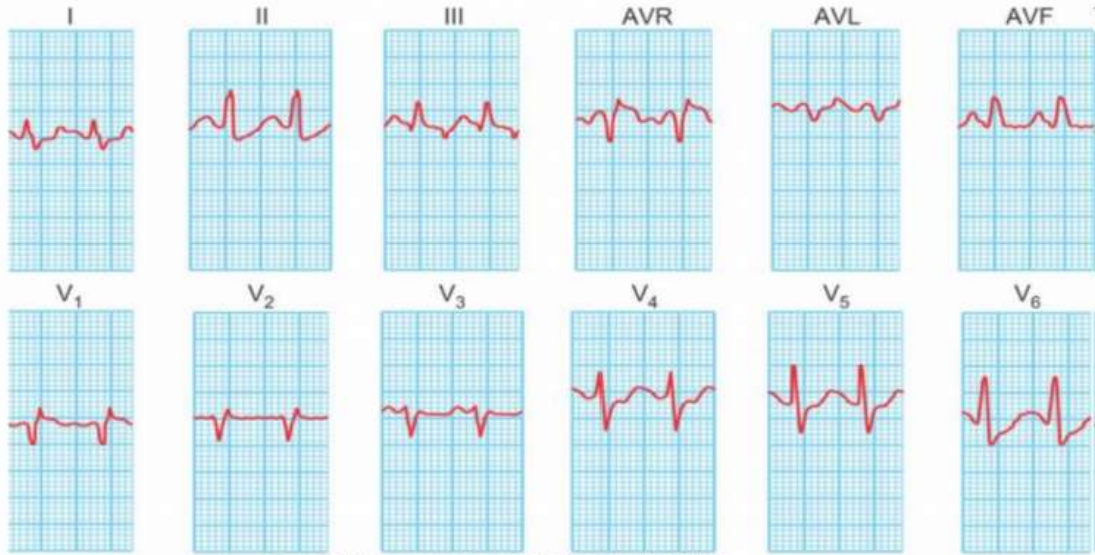
### 7. MRV- imaging

الفحوصات و الاجراءات الي بنطلبها  
الدكتور حكي اطلعوا عليهم اطلع  
الكرام 🙏 بس نصيحة ركزوا على  
الي عليه خط

الي صون اعرفوهم ت

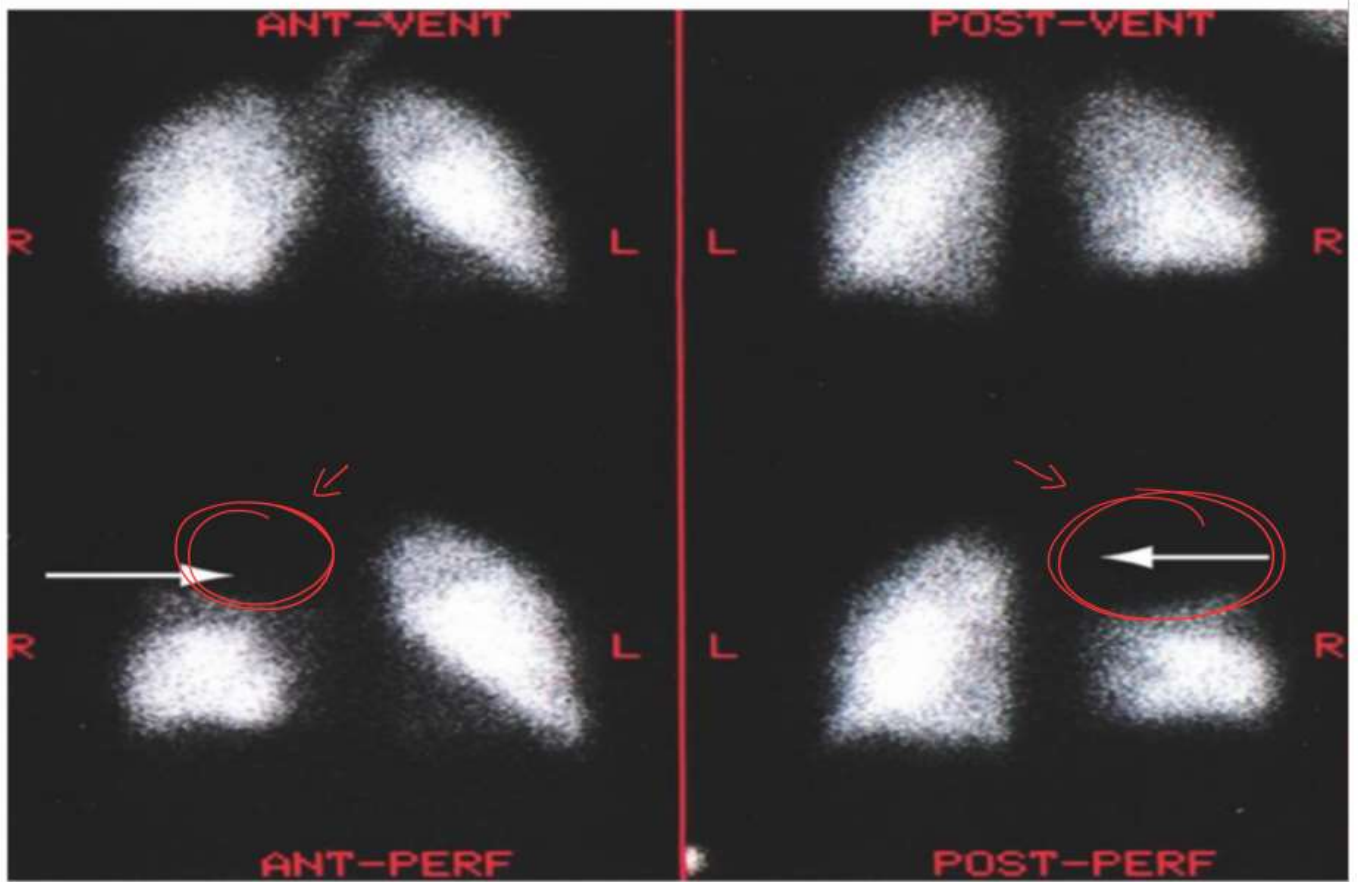






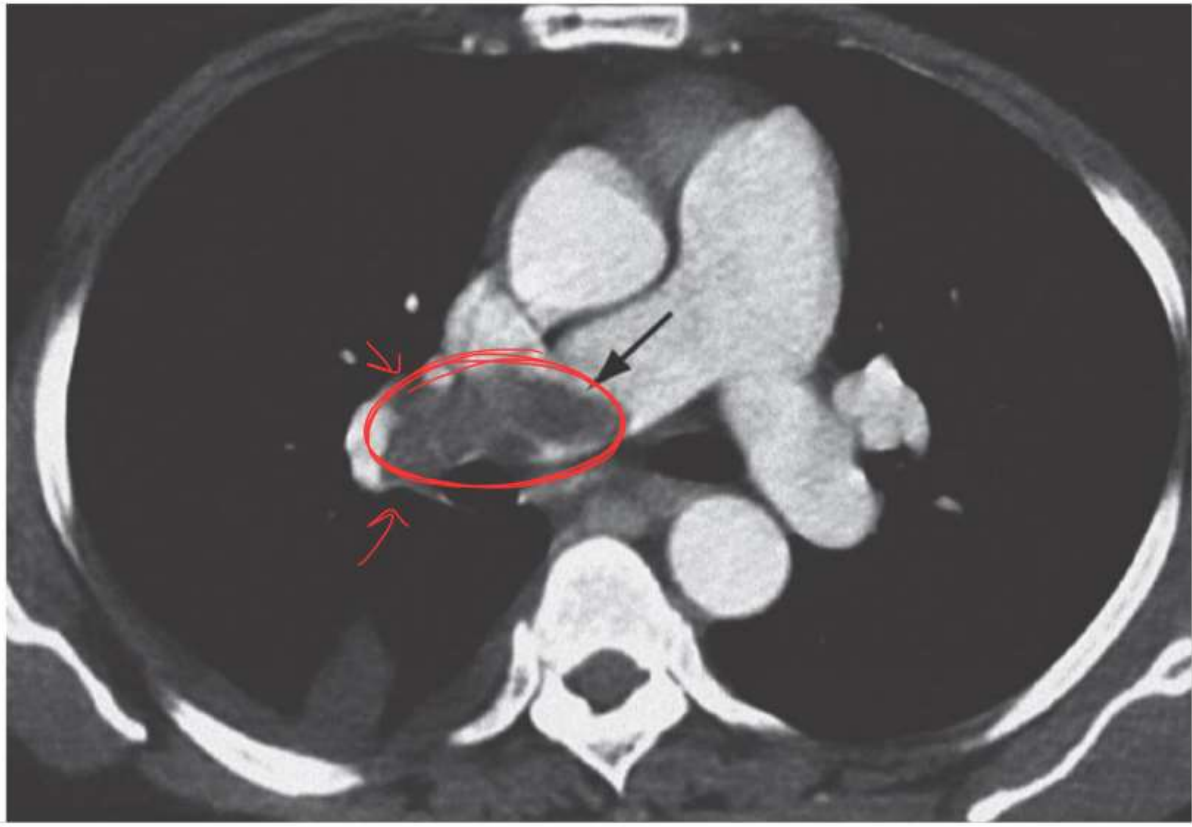
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ملفي



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ماتت المنطقة الي بغذيها الشريان  
الدكتور حكى هون في عنا ventilation بس ما في perfusion



في عنا embolus سكرت الartery و بتلاحظوا كيف اللون خفيف هاد  
 دليل على انقطاع الدم فيها  
 و نوع الPE هو Massive

## Treatment

Acute management :-

ADMIT-ICU- MOINTERING

1- High flow O2 therapy

2- Bed rest

3- Analgesia- OPIATE  
 مسكنات

4- I.V. fluids- PLASMA EXPANDER

5- Inotropics: are drugs that tell your heart muscles to beat  
 or contract with more power or less power

سريعاً هدول الاشخاص بدخلهم ICU و  
 بزودهم باعلى تركيز اكسجين و بمنعهم  
 يبذلوا اي جهد و بعطيهم مسكنات و IV  
 fluids



## Dissolution of the thrombus :-

### TREATMENT

العلاج و التخلص من thrombus يكون بشكلين :

1. **Fibrinolytic therapy** like streptokinase (250 000 u.) by i.v. infusion over 30 minutes , followed by streptokinase 100 000 units i.v- hourly for up to 12-72 hours ).

\***Streptokinase** is used to dissolve blood clots that have formed in the blood vessels

\***Alteplase** is indicated for the treatment of acute ischemic stroke

### ALTIPLASE-

## 2. Surgery :-

Pulmonary embolectomy is only

indicated in **massive pulmonary embolism**

TREATE THE UNDERLING AETIOLOGY

## Prevention of further emboli :-

- LMWH or conventional heparin

- Oral anticoagulants-

- WARFARIN-

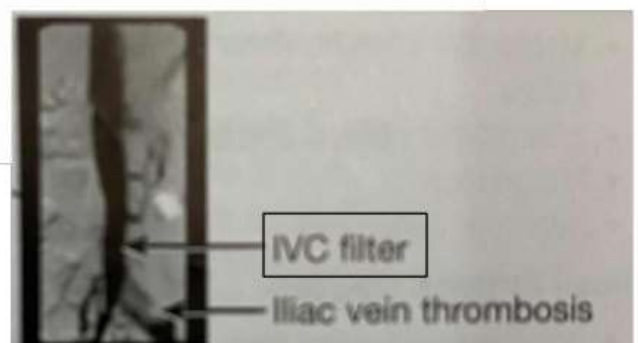
-NEW ORAL ANTICOAGULANT

DABIGATRAN – APIXBAN- REVORXIBAN

Inferior vena cava filter –

FOR recurrent PE-

anticoagulation is contra-indicated



# Quiz Time



1. A 72-year old man was admitted to the hospital following a fractured neck of femur. He suddenly becomes unwell 5 days after his operation. He is complaining of chest pain and shortness of breath. The pain is worst on deep inspiration. He has a past medical history of COPD, hypertension and hypercholesterolaemia. There are no clinical findings on examination. His observations include temperature 37.8, blood pressure 102/84mmHg, heart rate 110bpm, respiratory rate 24/ minute and SpO<sub>2</sub> 86% on room air. What is the most likely diagnosis?

- A. Exacerbation of COPD
- B. Pulmonary embolism (PE)
- C. Hospital-acquired pneumonia
- D. Myocardial infarction
- E. Pneumothorax

2. A 30-year old woman presents to the Emergency Department with shortness of breath. She has recently returned from holiday in America.

Clinical examination is unremarkable. A diagnosis of pulmonary embolism is suspected. What is the most common ECG finding in a pulmonary embolus?

- A. S1Q3T3 pattern
- B. Sinus tachycardia
- C. Sinus bradycardia
- D. Prolonged QT interval
- E. Tall, tented T waves

3. The most serious complication of leg vein thrombosis is:

- a) Renal infarction
- b) Myocardial infarction
- c) Pulmonary embolism
- d) Cerebral infarction
- e) Intestinal infarction



4. If the following events are placed in correct order which will come fourth:

- a) Major abdominal surgery
- b) Deep venous thrombosis
- c) Embolization
- d) Pulmonary infarction
- e) Stasis in the calf veins

5. If the following events are placed in their correct order which will come fourth:

- a) Pulmonary infarction
- b) Senile osteoporosis
- c) Pulmonary embolism
- d) Deep vein thrombosis
- e) Fracture neck of femur

6. If a clot were to "embolize, " this means it has...

- A. Attached itself to another clot
- B. Decreased in size
- C. Broken loose
- D. Hardened

7. You are at-risk for developing deep vein thrombosis or pulmonary embolism if you:

- A. Are obese
- B. Have had recent surgery
- C. Smoke
- D. Any of the above

8. Who is at greater risk for pulmonary embolism?

- A. Men
- B. Women
- C. Young women
- D. The risk is the same for men and women

9. Signs and symptoms of deep vein thrombosis (DVT) can include:

- A. Redness, warmth, tenderness and swelling
- B. Shortness of breath, chest pain, coughing blood
- C. Muscle spasms, vertigo, ringing ears
- D. All of the above

10. Signs and symptoms of pulmonary embolism (PE) can include:

- A. Redness, warmth, tenderness and swelling
- B. Shortness of breath, chest pain, coughing blood
- C. Muscle spasms, vertigo, ringing ears
- D. All of the above

11. A nurse is assigned to a client with venous thrombus. The nurse identifies a nursing diagnosis of Impaired physical mobility related to pain. Which should the nurse do first?

- A. Elevate the legs.
- B. Elevate the legs by using a pillow under the knees.
- C. Encourage adequate fluid intake.
- D. Massage the lower legs.

12. Client is discharged after being hospitalized for thrombophlebitis. She will be driving home with her daughter, who lives 2 hours away. During the 2-hour ride, the nurse should advise the client to:

- A. Perform arm circles while riding in the car.
- B. Perform ankle pumps and foot range-of-motion exercises.
- C. Elevate her legs while riding the car
- D. Take an ambulance home

13. Based on (Virchow's Triad) select which patients below are at RISK for the development of a deep vein thrombosis?

Select all that apply:

- A. A 55-year-old male with hyperlipidemia and diabetes.
- B. A 70-year-old female with severe sepsis.
- C. A 25-year-old male who uses intravenous drugs.
- D. A 65-year-old female who is post-op day after joint replacement surgery.

Answers

1. B

5. C

9. A

12. C

2. B

6. C

10. B

13. B+C+D

3. C

7. D

11. A

4. C

8. D