

# COMPLICATIONS OF DVT: PULMONARY EMBOLISM

FM FLAME LECTURE: 96

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SWEDISH FAMILY MEDICINE RESIDENCY

# LEARNING OBJECTIVES

- ▶ To understand the different types of presentation of a pulmonary embolism
- ▶ To understand the different methods to diagnose a PE
- ▶ To describe treatment options for pulmonary embolism
- ▶ Prerequisites: NONE
- ▶ See also – for closely related topics
  - ▶ **FM FLAME 93**: DVT Risk Factors and Pathogenesis
  - ▶ **FM FLAME 94**: DVT Presentation and Diagnosis
  - ▶ **FM FLAME 95**: DVT Treatment and Management

# PRESENTATION OF PE IN PATIENT WITH KNOWN DVT

- ▶ Symptoms may range from asymptomatic to shock; therefore, the diagnosis of PE requires a high level of clinical suspicion
- ▶ Think about PE for all patients with known DVT and:
  - ▶ New or worsening dyspnea
  - ▶ Hypoxia / Tachypnea
  - ▶ Cough, orthopnea, wheezing, hemoptysis
  - ▶ Chest pain (specifically pleuritic)
  - ▶ Hypotension, tachycardia

# DIAGNOSIS

## ▶ Wells' Criteria for PE

- ▶ In patients with established DVT, patients automatically score 7.5 points if the clinician suspects PE
- ▶ This suggests a 28% incidence of PE and requires imaging with CTPA or VQ scan
  - ▶ D-dimer has no use in patient with known DVT (it will be positive and give no additional information)
  - ▶ Imaging has 95% or greater negative predictive value to rule out PE
  - ▶ VQ scan used in patients with allergy to contrast material or patients with renal dysfunction
  - ▶ CTPA has less radiation than VQ scan and is preferred in pregnancy (MRI has insufficient sensitivity)

# DIAGNOSIS

## ▶ Risk stratification

- ▶ High risk factors: right ventricular dysfunction (echocardiography, troponin), shock, hypotension, cancer, immobilization due to neurologic disease, age > 75, cardiopulmonary disease

## ▶ Provoked vs. unprovoked

- ▶ Provoked = malignancy, trauma, major surgery, acute illness, immobilization, hormone supplementation
  - ▶ Significantly lower risk of recurrence if modifiable factor

# MEDICAL TREATMENT

- ▶ Choice of anticoagulation (Grade 2C)
  - ▶ Active cancer: low-molecular weight heparin preferred
  - ▶ Patients w/o cancer: DOACs preferred (dabigatran, rivaroxaban, apixaban, edoxaban) over vitamin K antagonist (warfarin)
    - ▶ Dabigatran and edoxaban require overlap with parenteral AC, whereas apixaban and rivaroxaban do not
    - ▶ If unable to use DOAC, then warfarin is preferred over LMWH
- ▶ Do NOT use IVC filter unless AC is contraindicated (Grade 1B)
- ▶ Do not use thrombolytic therapy unless PE is complicated by hypotension (Grade 1B)
  - ▶ Thrombolytic therapy is preferred in these situations over catheter-based thrombus removal unless patient has elevated bleeding risk

# MEDICAL TREATMENT

- ▶ In pts with subsegmental PE (no involvement of more proximal pulmonary arteries) and no proximal DVT in the leg who:
  - ▶ Are considered low risk for recurrent VTE → consider clinical surveillance over anticoagulation (Grade 2C)
  - ▶ Are considered high risk for recurrent VTE → consider anticoagulation over clinical surveillance (Grade 2C)
  - ▶ NIVA of legs should be done to exclude proximal DVT
- ▶ In pts with low-risk PE and whose home circumstances are adequate, consider tx at home or early discharge from hospital vs. standard discharge (after 5 days of treatment) (Grade 2B)
- ▶ Recurrent or progressive VTE while pt is compliant and on therapeutic doses of AC should prompt evaluation of underlying malignancy
  - ▶ If on DOAC, then transition to LMWH
  - ▶ If on LMWH, then increase dose by 25-33%

# DURATION OF TREATMENT

- ▶ All patients are to receive at least 3 months of anticoagulation (Grade 1B)
  - ▶ Longer treatment of 6-12 months or indefinite anticoagulation is suggested for patients with non-modifiable risk factors as well as patients with unprovoked VTEs and low bleeding risk
  - ▶ Duration past 3 months requires shared decision making with the pt, PCP, and occasionally specialist recommendation
  - ▶ In pts who have an unprovoked proximal DVT or PE, consider ASA in pts who want to stop AC after 3 months (Grade 2C)



## IMPORTANT LINKS / REFERENCES

- ▶ 1. Antithrombotic Therapy for VTE Disease. CHEST Guideline and Expert Panel Report. CHEST 2016; 149(2): pp.315-352.
- ▶ 2. Agnelli G, Becattini C: Acute Pulmonary Embolism. N Engl J Med 2010; 363: pp. 266-274.
- ▶ 3. Wells Score. MD Calc [www.mdcalc.com](http://www.mdcalc.com)