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# Clot in Transit: Diagnosis and Treatment

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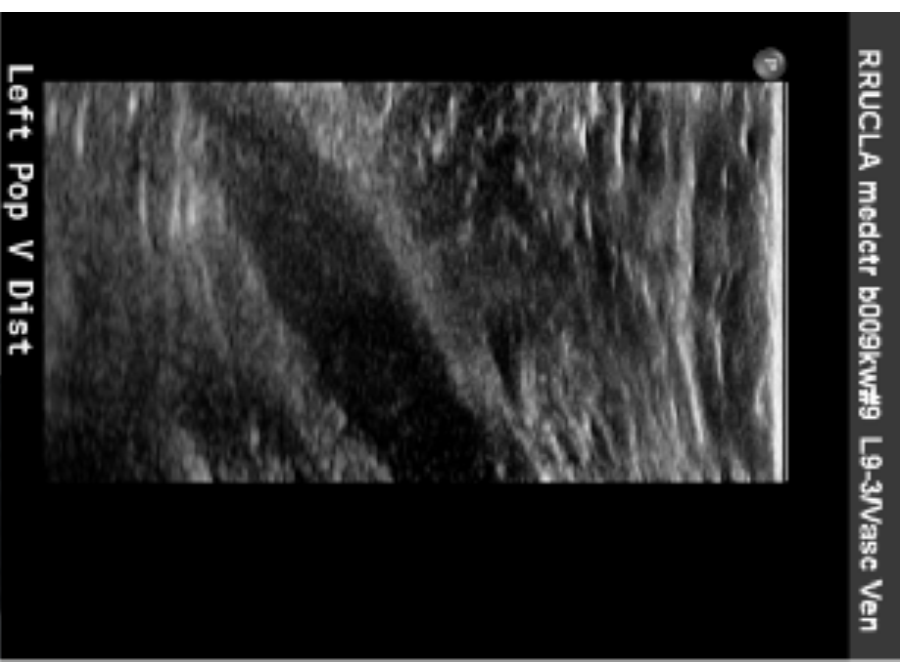
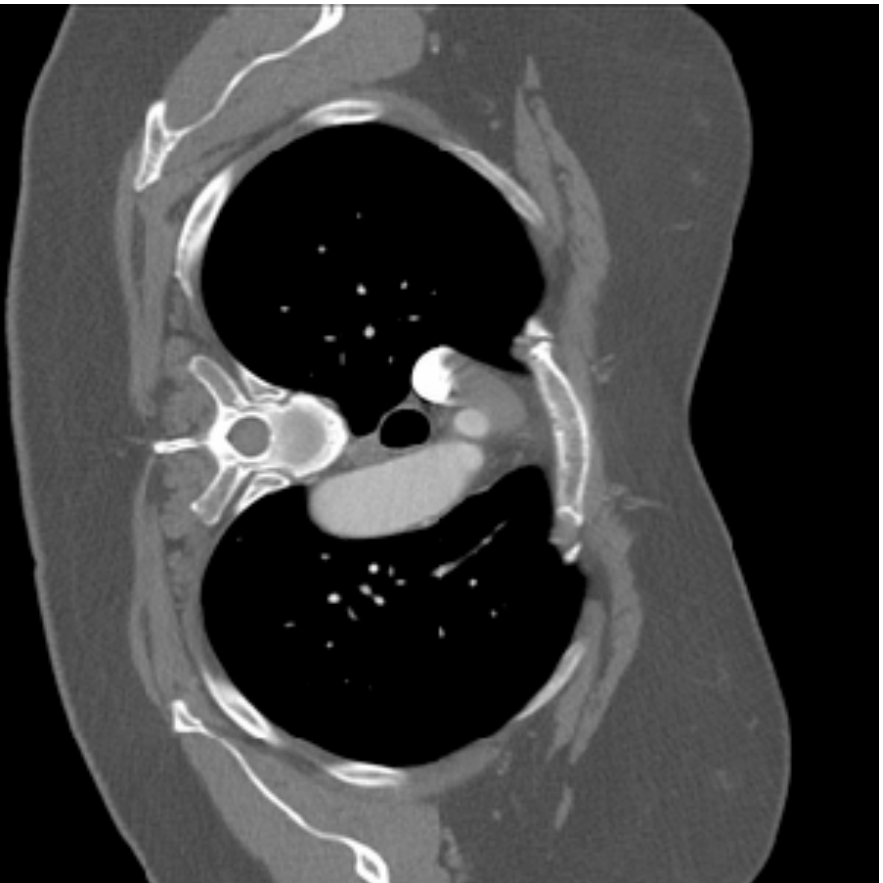
# Disclosures: John Moriarty

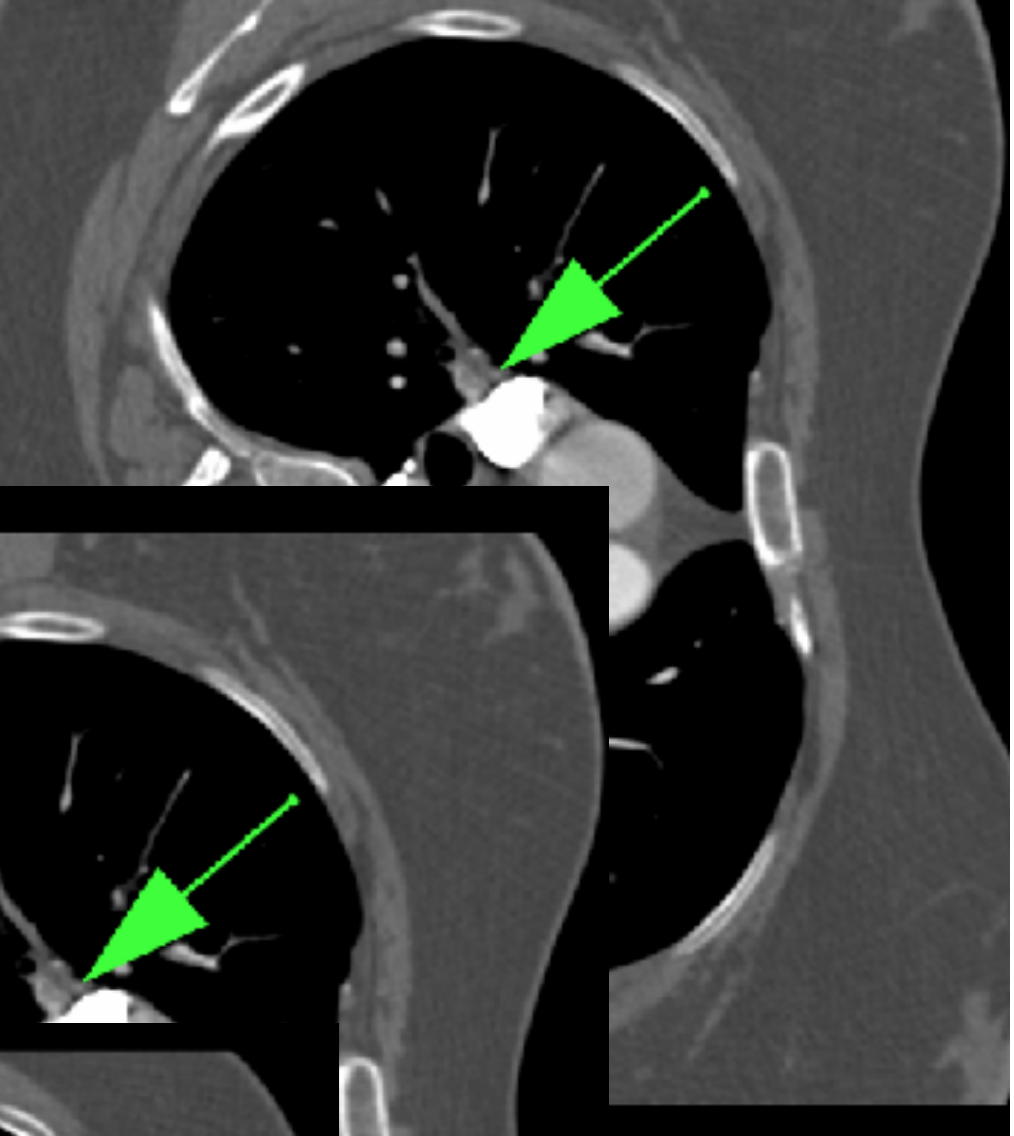
## 2015-2016

- *Angiodynamics inc*
- *Argon Medical inc*
- *Inari Medical inc*
- *Penumbra inc*
- *Sequent Medical inc*

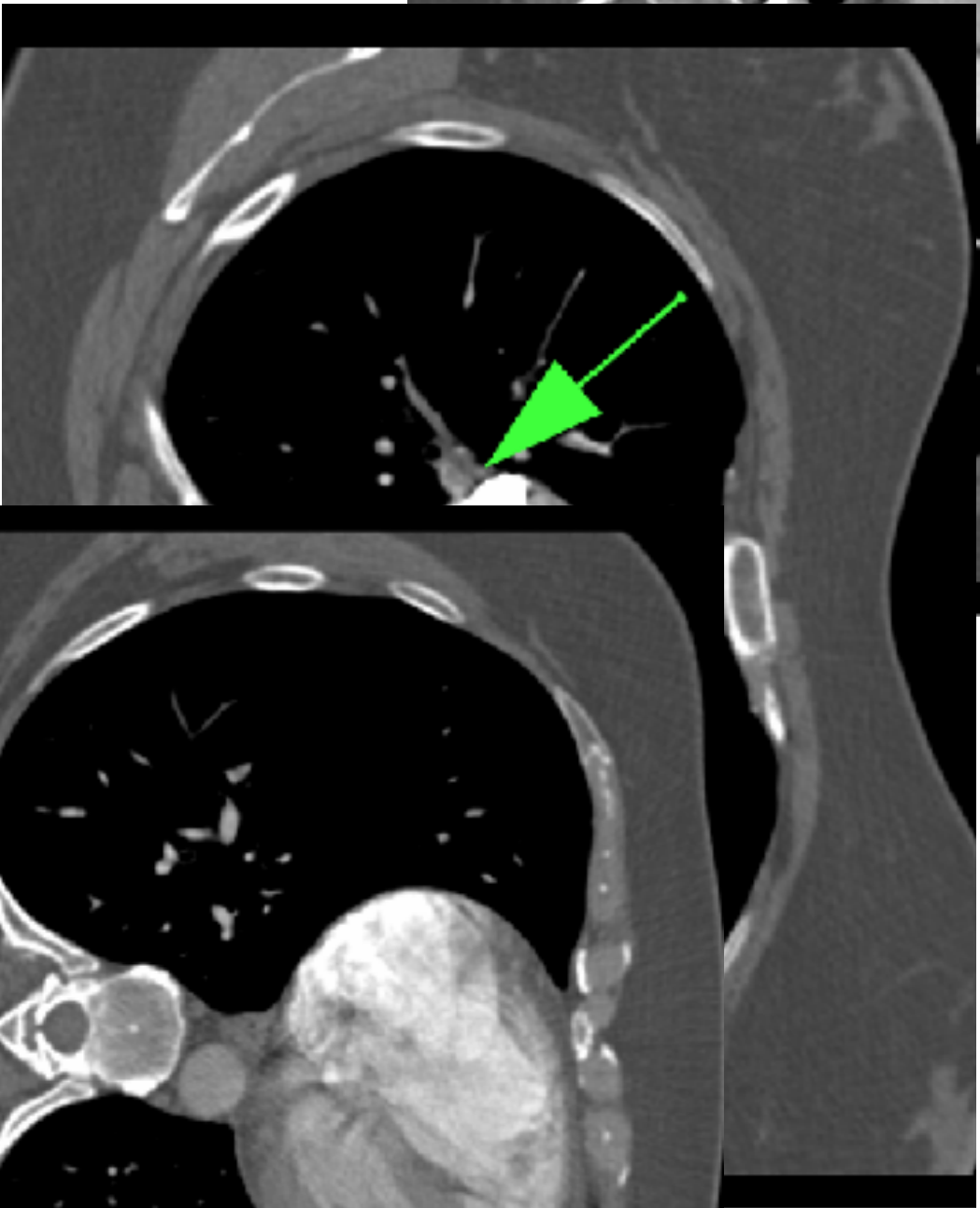
# Real Life Problem for PERTS

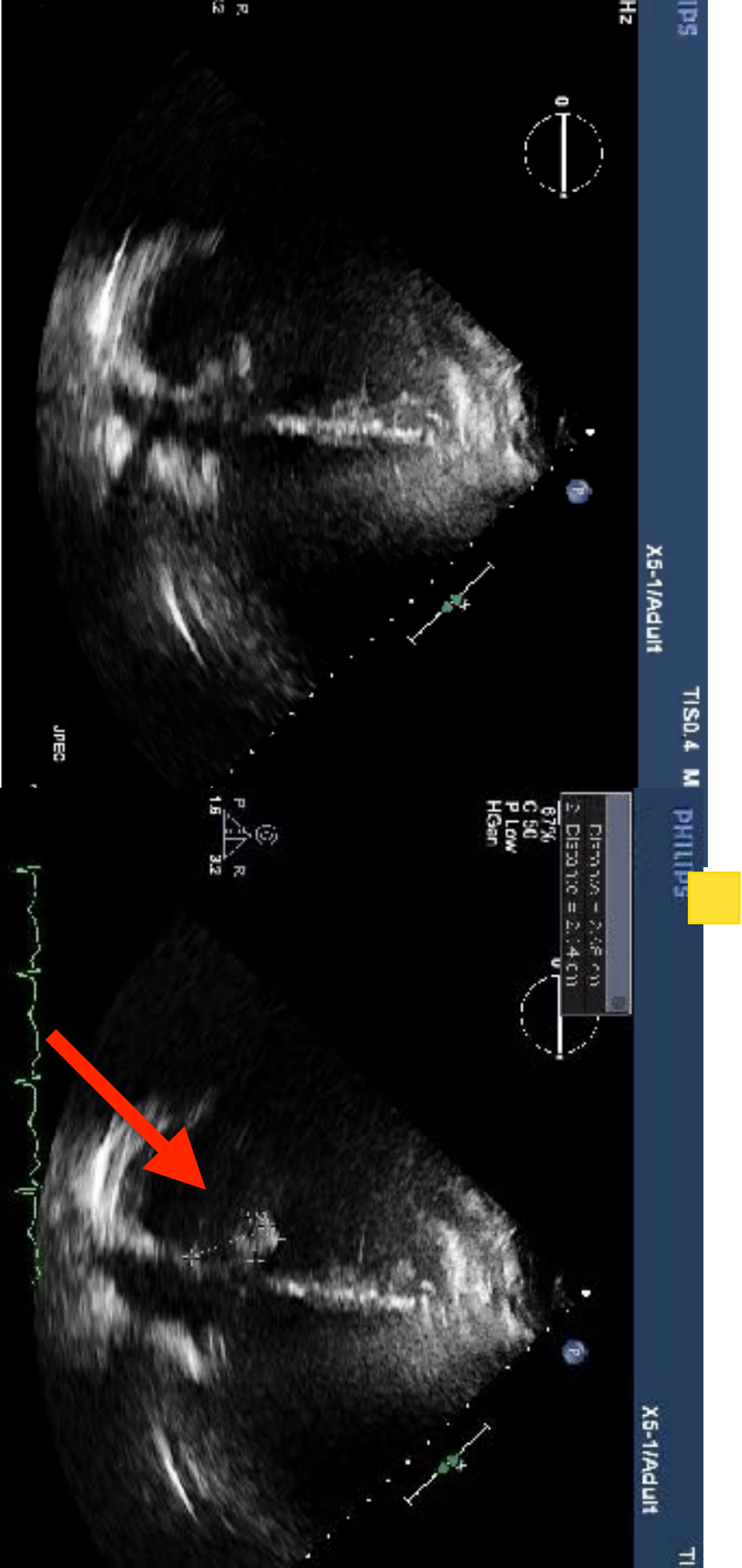
- 49yo Female
  - BMI 35, Yasmin OCP
  - 24hr Dyspnoea
    - No CP, syncope, cough, hemoptysis, leg swelling
  - ER: BP 158/99, HR 109, O2S= 91% ra
  - TnT: 0.09, BNP 240, DDimer >10,000
  - Creat 0.8, PTT 27, WCC 9.2





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# Decision Time

- Further work up vs urgent?
- Anticoagulation?
- IVC Filter?
- Systemic Lysis?
- Mechanical Therapy?
- CDT?

# Management and Course

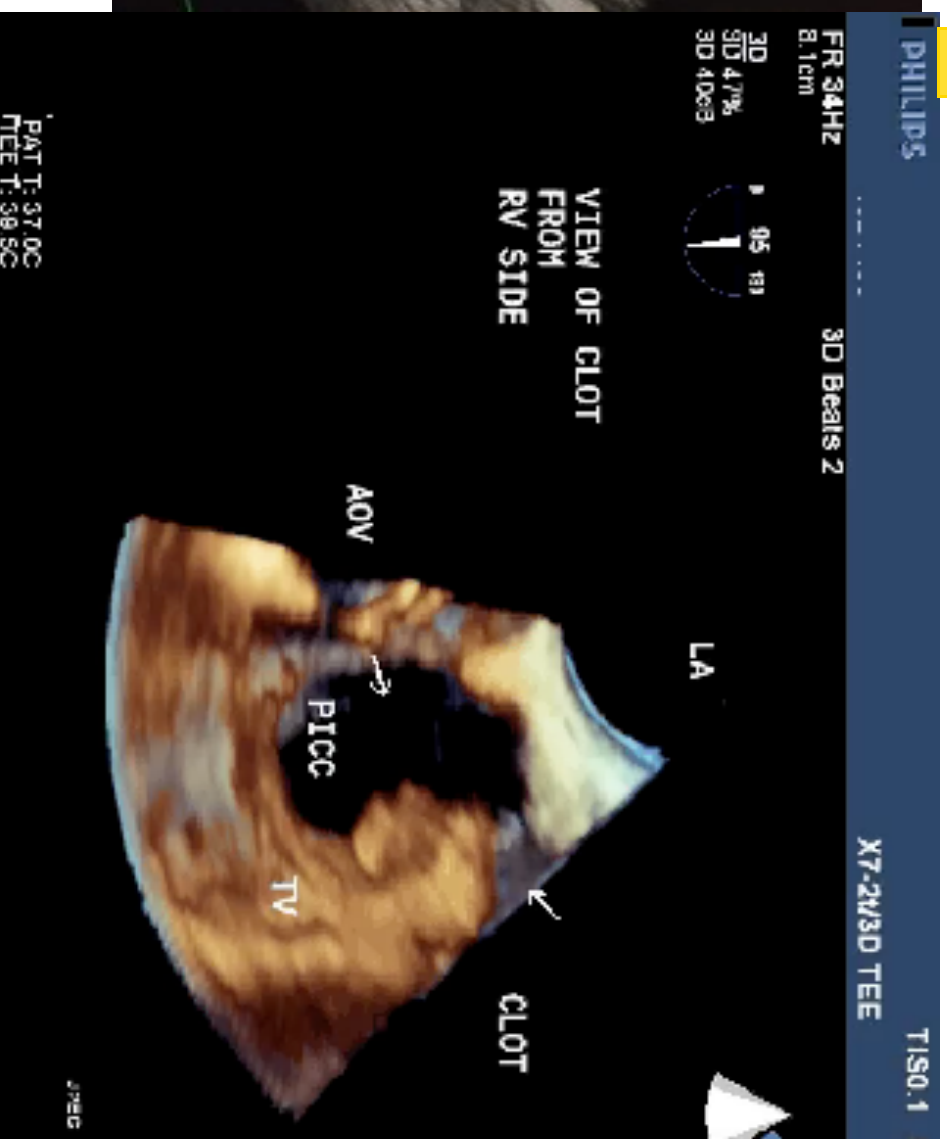
- IV TPA (50:50)
  - Fibrinogen <25
- IVC Filter
- UFH (60-80 target)
- Rivaroxiban
- Thrombophilia:
  - DRVVT moderately positive



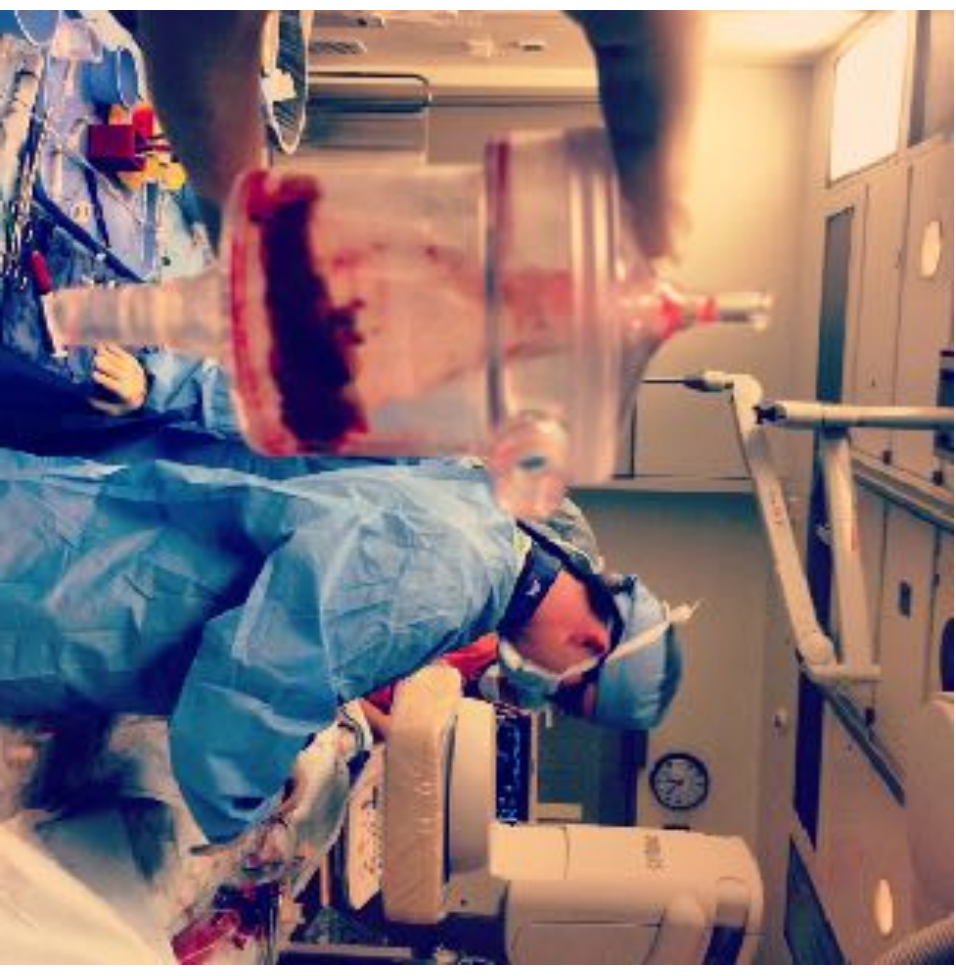
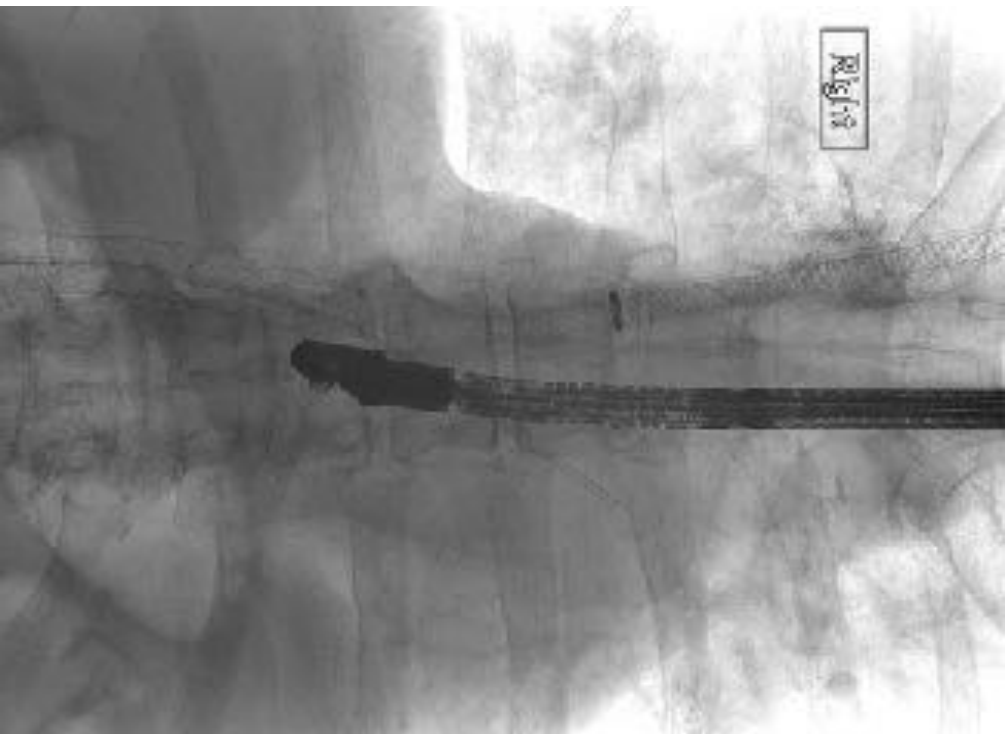
# 6 month F/U

- Symptomatically normal
- Exercise tolerance good
- Weight loss program
- IVC Filter removal
- 6/12 DOACs
- Rpt echo normal

# PE in Transit



# Endovascular Thrombectomy



# Clot in Transit: How Common?

- 4% with PE (ICOPER)
  - 12/335 pts w massive PE
  - Italian PE Registry 4.5%
    - 16% High, 3.8% Intermediate, 0.3% Low risk
- 96% RA vs 3% RV
  - Case series 177 RHT
- 98% RH Thrombi co-existent PE

Torbicki-JACC-2003

Pierre-Justin- IJC\_2005

Altapan\_Vasc Med\_2015

Rose\_Chest\_2012

Casazza\_ThromHaem\_2014

12

# Morphology

- Morphology
  - Snake like: 2/3
  - Ball-like: 1/3
  - Perimural: 5%
- Mobility
  - Mobile 85% vs Immobile 15%
- Size
  - > 5cm 1/3 vs <5cm 2/3

# How Dangerous is it?

- Metanalysis:
  - 100% mortality w/o Rx vs 27% with Rx
  - Assoc w increased hemodynamic instability vs PE alone

Rose\_Chest\_2012

# RiHTTER Registry

- 138 pts, multicenter registry
- 30d M assoc w hemodynamics of PE, not RHTT characteristics
- RHTT higher PE mortality than controls (19% vs 8%,  $p=0.003$ )
- Normotensive PTs w RVLD (16% vs 7%)
- 62% death in first 24hrs
- 0/24 low risk pts died of PE

Koc\_ERJ\_2016

# European Guidelines

Although the impact of RiHT on mortality in PE is as yet unclear, the presence of RiHT should be considered a potentially life-threatening condition

Konstantinides\_EHJ\_2014



# How to treat it

- Anticoagulation
- Systemic thrombolysis
  - Catheter directed thrombolysis
- Surgical thrombectomy
- Aspiration thrombectomy

*J Vasc Interv Radiol.* 2016 Jun 6; pii: S1051-0443(16)30023-9. doi: 10.1016/j.jvir.2016.03.045. [Epub ahead of print]

**Removal of Caval and Right Atrial Thrombi and Masses Using the AngioVac Device: Initial Operative Experience.**

Moriarty JM<sup>1</sup>, Al-Hakim R<sup>1</sup>, Bansal A<sup>1</sup>, Park JK<sup>2</sup>.



David Geffen  
School of Medicine

# Anticoagulation alone

- 28.6 - 37% Mortality
- vs 91% if untreated
- ? Delay in escalation.....

Athapan\_Vasc Med\_2015  
Rose\_Chest\_2012

# Systemic Thrombolysis

- Metanalysis: 122pts: **13.7%** Mortality (OR 4.83)
  - 12 pts w acute massive PE and RHT
    - 3 died before Rx, 9/12 1yr survival
    - 7/9 had thrombus resolution @ 12hrs, 2/9 Sx
  - 11.3% mortality
    - Signif improvement mortality vs AC/Sx
- Dosing: Standard
  - Half dose (50mg) success case report
- Clot dislodgement/distal embo... No evidence

Pierre-Justin- JJC\_2005

Rose\_Chest\_2012

Patel -JICM-2016



# Surgical Embolectomy

- 13.9% - 23.6% mortality
  - OR 2.61 for survival (vs 4.83 w lysis)
  - Complications: 13.2% (vs 10% Lysis)
- Performed in 23% RHT

# Summary

- 4% of PE, 98% w PE, 96% RA
- Snake like, mobile, < 5cm
- More likely to present w massive/HR PE
- Increased mortality vs controls, especially if RVD
- Rx:
  - Limited evidence
  - Systemic Lysis > Surgery > AC alone
  - ? CDT, ?suction/percutaneous
- Best paper to read: RIHTER (Koc, ERJ, 2016)

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