Case Presentation

• This is a 43 year-old healthy male who developed acute dyspnea while walking up one flight of stairs
  – Symptoms progressed over 12 hours
  – Unable to walk to car → called ambulance
  – No chest pain
  – No recent surgery, immobilization, prolonged travel

• Past Medical History
  – Gout
  – Lumbar disc disease s/p remote surgery x 2

• Medications: None

• Family History:
  – Mother with pulmonary embolism

• Social History:
  – Unemployed, no nicotine, remote alcohol abuse

• Pertinent Exam Findings
  – Moderate respiratory distress
  – HR 122, BP 160/90, Sat. 85% on NRB
  – Normal JVP
  – Tachycardic, no gallops or heaves
  – No lower extremity edema

• Pertinent Labs:
  – Troponin 0.02, BNP 396

• Outside hospital course
  – CT chest confirmed bilateral PE
  – Anticoagulation initiated (enoxaparin, warfarin)
  – Admission to hospitalist
  – Echo following day showed thrombus in RA
  – Transferred to MGH for thrombectomy
Chest CT

Echocardiography (Trans-esophageal)

Suction Thrombectomy

Angiography

22F Cannula
Veno-venous bypass

Post-Echo
**Procedural Summary**

- Successful aspiration of RA thrombus
- Overnight ultrasound-enhanced thrombolysis
- Hospital course
  - Hypercoagulability workup negative
  - Transfer to floor day #3
  - Discharge day #5 (dalteparin/warfarin)

**Current Status of “Significant” PE Therapy**

- Best treatment unknown - no “standard approach”
- MGH example - strategies “all over the map”
  - No consistency in decision-making
  - No single “team” or “clearing-house”
  - No accepted algorithm
  - No systematic evaluation of results
  - No centralized location for care
- Many patients (50%) are not candidates for systemic thrombolysis which leads to under-treatment

**Data for High-Risk PE and Thrombolysis**

<table>
<thead>
<tr>
<th>Mortality Rate (%)</th>
<th>Massive PE</th>
<th>Submassive PE</th>
<th>Lower Limb</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>54</td>
<td>14</td>
<td>40.3</td>
</tr>
<tr>
<td>Mild</td>
<td>8.9</td>
<td>3.0</td>
<td>1.3</td>
</tr>
<tr>
<td>Severe</td>
<td>4.6</td>
<td>3.0</td>
<td>4.8</td>
</tr>
</tbody>
</table>

**MGH Pulmonary Embolism Response Team (PERT)**

- Collaborative team-based approach to PE management: cardiologists, pulmonologists, cardiothoracic surgeons
- Goals:
  - Raise awareness of high-risk PE population
  - Optimize therapy for submassive and massive PE
  - Data repository to define patients, outcomes
  - Non-invasive Rx will be utilized for some patients
  - CDT may be ineffective for some groups
Submassive PE
11-16-15

Kenneth Rosenfield, MD
David Ain, MD
Peter Monteleone, MD
Ray Liu, MD

73 year old female

- Past medical history
  - Breast cancer
  - Left lower extremity lymphedema
  - Intrathoracic gastric obstruction
- 4 wks s/p Collis-Belsey fundoplication
- 12 days s/p esophagoscopy and percutaneous gastrostomy

Presentation

- At rehab- sedentary
- Developed acute onset dyspnea and presyncope
- Evaluated at OSH
- CT-PA performed
Impression:

- Saddle pulmonary embolus with right ventricular dilation suggesting acute right heart strain
- RV/LV ratio > 1.2 ... no contrast in LV so difficult to assess

BP stable 120/70s
- HR 100s
- O2 sats 93% on NRB
- Heparin bolus + infusion initiated
- PERT team contacted and patient transferred to MGH ED
- PERT Activation: GoToMeeting (8 participants... Vasc Med, Card, Pulm Crit Care, CT Surgery, Medicine, Radiol)

LE Doppler
- Left distal femoral vein and popliteal vein DVT

Transthoracic echocardiogram
- RVSP 67mmHg
- Hyperdynamic RV apex
- RV and main PA dilatation
- Mobile echodensities in main PA
• NEXT STEP...

• Decision to proceed to endovascular thrombectomy with Inari Medical device
• O2 sats dropped progressively from 88 → 82
• BP 140, HR 100
• Decisions re: Therapy?....
• CPAP added → O2 sat up to 95
• EKOS catheter directed thrombolytic bilat
  – Dose...8mg over 4h, then 8mg over 8h (16 total)
• 22 F sheath removed
• Monitored closely in MICU

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**Inari FlowTriever™ Infusion Aspiration System**

- FDA 510(k) approved for removal of thrombi and emboli from blood vessels
- Immediate flow restoration and relief of hypoxemia
- Thrombus disruption and retrieval
- Provides for direct infusion of tPA into the thrombus, if desired
- Enhance thrombolysis by increasing flow and thrombus surface area
- Designed to easily navigate through tortuous vascular anatomy
- Delivers FlowTriever system to the thrombus
- Wide-bore catheter effective for aspiration of thrombus
- Retracts both the FlowTriever and thrombus into the AGC
- Synchronizes aspiration and FlowTriever retraction
- Aspirated thrombus is collected
FlowTriever in Acute PE

Pre Post

Tod Engelhardt MD – East Jefferson General Hospital

Pre Post

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