PULMONARY EMBOLISM INTERVENTION WITH ANGIOJET THROMBECTOMY

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Disclosures
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Introduction
- Pulmonary embolism (PE) is responsible for 200,000 deaths in the United States annually.
- Currently the mainstay of treatment is systemic anticoagulation.
- However for the subsets of massive pulmonary embolism and submassive pulmonary embolism there have been recommendations made for more aggressive therapy.

Proposed Definitions AHA

Massive
- SBP < 90 mm Hg > 15 minutes
- Requiring inotropic support to maintain SBP > 90 mm Hg
- Not due to a cause other than PE
- Arrhythmia
- Hypovolemia
- Septicaemia
- MI

Submassive
- No systemic hypotension or hemodynamic instability
- Myocardial necrosis.
- Troponin I > 0.4 ng/mL.
- Troponin T > 0.1 ng/mL.
- Right ventricular dysfunction
- RV dilation
- RV systolic dysfunction
- Elevation of BNP > 90 pg/mL.
- New complete or incomplete right bundle-branch block.
- Anteroseptal ST elevation or depression, or anteroseptal T-wave inversion.

Inclusion Exclusion Criteria

Inclusion
- Hemodynamic instability
- Right Heart Dysfunction
- Elevated Troponin
- PA Pressures > 60 mmHg
- Subjective Discomfort

Exclusion
- Actively bleeding
- Not able to tolerate any systemic anticoagulation
- Recent surgery did not exclude patient

Methods
- Internal jugular vein access
- Inferior vena cava filter
- Access to the pulmonary arteries
  - Short Bern diagnostic catheter
  - 3drc guide catheter.
- Lytic Agent TPA massive and submassive
- 16 mg in 50 cc NS
- Mechanical Thrombectomy only in massive and if not improved with power pulse
- Pulmonary angiography was not routinely performed
Methods

- Patient's clinical status determines the duration of catheter thrombectomy
- Blood pressure
- Pulse
- Oxygen saturation
- Discontinued once the patient's oxygen saturation was above 95%, weaning off of inotropes, and pulse rate trending towards normal

Complicating Factors

- Symptomatic bradycardia
- External pacing
- Arrhythmias
- Hemolysis
  - Greatly reduced in power pulse only cases
  - Esophageal Spasm
- Hydration resolves in 24 hours

Post Procedure Followup

- Two week follow up
  - General function
  - Access sites
- One month
  - Repeat Echo
  - IVC filter removal
  - Patients would remain on systemic anticoagulation for 6-12 months.
  - Hematologic workup if negative oncologic work up

Data Series

- 2008 Chechi/Margheri 51 patients 8 deaths at 35 months
- 2008 Margheri 25 patients 4 deaths at 61 months F/u
- 2007 Chauhan 14 patient 3 deaths 9 months
- 2005 Saiblis 6 patients 1 death acute results only
- 2003 Zeni 17 patients 2 deaths followed to discharge
- Death rate 12-22% for Submassive and Massive

Results

- 60 patients (23 male)
- Mean age was 60.86 years (range 30-89 years)
- 26 massive and 34 submassive pulmonary embolus
- Technical success was achieved in all cases.
- 2 deaths within 30 days (3.3%)
- One patient expired 14 hours after the procedure with a suspected paradoxical embolus to the intestines
- One patient hemodynamically stable but brain dead

Results

- Two patients passed away after 30 days (cancer, sepsis)
- There was no bleeding events within 72 hours of procedure
- 56 surviving patients had normal right heart function on echo at 30 days
- 1 episode of renal failure which was remote from the procedure and did resolve
- 4 Deaths (6.6%) with mean 36 months (5-55 months) f/u
Discussion

- First the technical expertise must be available.
- The fluoroscopy suite must be available on an emergency basis.
- In our institution we use the same protocols for call in and transport as for ST elevation myocardial infarctions, which allows us to get the patient up and into the fluoroscopy suite within 30 minutes.
- Protocols in place for the emergency department, ICU, and hospitalists for both deep vein thrombosis and pulmonary embolus.

Conclusion

- Massive or submassive PE can be treated safely in a community hospital setting.
- Reduction or elimination of ICU stay
- Shorten overall hospital length of stay
- Reduce/Eliminate the need for home oxygen therapy
- Help restore right heart function
- Development of institutional expertise in conjunction with protocols to administer this therapy early in the course of massive and submassive PE may yield significant mortality and morbidity benefits in community hospitals.