Pulmonary complications of Venous malformations: Awareness and prevention

44 year old with symptomatic lower extremity venous malformation

Embolization with absolute alcohol

Post 8 ml Etoh with outflow compression

Good angiographic outcome—thrombosis of treated area

- Awakened, extubated, transferred to cart
- Immediate respiratory distress, hypotension
- Rapid re-intubation with very poor oxygenation, continued hypotension (60/30)

What happened??

- Transferred to angio table
- Re-cath with pulmonary cath and angio
- Pulmonary pressure: 80/60
- Intrapulmonary TPA 25mg administered over 10 min—minimal change in hemodynamics

Extremity Venous Malformation

- Transferred to ICU
- Continued infusion of TPA via pulm cath (1mg/hr)
- Continued hypotension, PA pressures without change
- Returned to IR
Case 2: 14 year old boy with painful lower extremity venous malformation
Followup
- Cardiology consult
- Continue TPA infusion
- Transfer to ICU for overnight infusion
- Fully intact and alert with normal PA pressures in AM

75 year old with RCC for pre-op embolization

Angio

Good no shunt with 20cc contrast

Shunting—not a problem. Just check the balloon occlusion contrast run

Post embo #1

- Balloon occlusion and 18cc ethanol given
- Some expected pain and minimal cough
- Stable
- Needs more ethanol
- Balloon occlusion test—no shunt
- 15cc ethanol
- Stable but again he coughs for about a minute or two

**Post embo #2**

- Residual vascularity
- What to do?
  - Coil RA
  - Particles
  - More ethanol
- Nah—gotta do a good job for our new best referring doc

- I had a sense that this was a bad idea
- Balloon occlusion test—OK.
- 10cc ethanol via balloon
- Patient coughs
- And coughs
- And coughs
- Restless & moving but rock stable

- Over the next ten minutes I watch closely and pace back and forth
- Patient continues to cough with increasing frequency and is more and more agitated and restless
- VSS
- What’s happening??

**Differential?**

- Drunk from about 40cc ethanol over 40 minutes?
- PE from renal vein?
- Pain related?
- Patient now just looks increasingly bad, moving, restless and agitated, coughing vigorously

**Time to act**

- Call for rapid response/code team
- My main differentials:
  - PE from renal vein
  - Ethanol toxicity:
    - PA spasm
    - RV ventricular failure
- Intubate
- PA gram
- PA gram negative
- PA pressure: 80/50
- Intra-pulmonary NTG 800 mcgm
- Mean PA pressure 36
- Second dose of 600 NTG
- Transfer to ICU
- Overnight stable with falling PA pressure
- Normal PA pressure in AM
- Extubated, discharged
- Uneventful nephrectomy 3 days later
- PA gram negative
- PA pressure: 80/50
- Intra-pulmonary NTG 800 mcgm
- Mean PA pressure 36
- Second dose of 600 NTG
- Transfer to ICU

Avoid/manage
- Large shunts—coil or laser occlusion first
- Too much ethanol too fast—
  - DO NOT EXCEED BOLUS LIMITS
  - DO NOT EXCEED WEIGHT-BASED LIMITS
- Central location