LIGHTNING STRIKES TWICE: Endovascular salvage of an early aortic anastomotic pseudoaneurysm

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DISCLOSURES

None applicable
INTRODUCTION

• Incidence 0.2 to 25%
• Likely underdiagnosed
• Incidence: femoral > iliac > aortic
• At diagnosis 8-40% are ruptured
• Mortality ranges from 61-67%
• Interval imaging at 3-5 years post-op
CASE PRESENTATION

- **HPI:** 61M transferred from an OSH with a 11.1cm AAA with report of several weeks of epigastric, back, and left flank pain
- **PMH:** MI s/p PCI 2016, HTN
- **Meds:** Plavix, Lisinopril, Lyrica
- **Social:** 30pk yr smoking hx
- **Physical Exam:**
  - BP: 96/64    HR 68
  - Epigastric tenderness, large pulsatile abdominal masses
  - Palpable distal pulses
CT abdomen/pelvis – PTD 0
PROCEDURE

- Bilateral iliac artery and suprarenal aorta clamped
- Distal lateral wall blowout with laminated thrombus – contained rupture
- 20mm tube graft
- Posterior wall secured with plegeted 3-0 prolene sutures
- End-to-end anastomosis to the aortic bifurcation
POST-OP

- Extubated POD1
- Retained distal pulses
- Discharged home POD4

READMISSION

- Acute onset abdominal pain
- Hypotensive
- Emergent CTA
Acute Aorta

Recommendations for Treatment of Aortic Dissection

1. Reduction of systolic pressure using IV beta-blockers (Esmolol) or beta blocker plus alpha-blocker combination (Labetolol). Beta-blockers are recommended because they reduce the force of blood ejected from the ventricle wall against the weakened aorta.
2. If further systolic BP reduction is necessary, consider using Nicardpine (calcium channel blocker) or Enalapril (ACE inhibitor).
3. Intubation and mechanical ventilation are recommended if there is profound hemodynamic instability.
4. Pain relief, morphine sulfate or fentanyl are recommended.
5. Diagnosis of aortic dissection is made by clinical signs and location of the site of the tear and false lumen. CT is the most common diagnostic test in an emergency. If the patient is unstable or CT is not available bedside ultrasound is another diagnostic option.

When are beta blockers contraindicated?

- Second and third degree heart block
- Asthma/COPD
- Coughing
- Diabetes (patients prone to hypoglycemia unawareness)
- PVD

Clinical Presentation

- Sudden severe, constant "tearing" sensation in low back, ABD, groin, or flank
- Syncope
- Shock symptoms: cyanosis, mottling, AMS, tachycardia, hypotension

Caveat: Some patients may present with normal vital signs as a consequence of retroperitoneal containment of hemotoma.

Risk Factors

- Hypertension
- > 50 years of age
- Tobacco abuse
- Males
- Family history of AAA
- Co-morbidities: CAD, PVD, PAD

Acute Aorta Recommended Management Guidelines

Call (912)350-3737 to transfer patients with an Acute Aorta.
Request the Vascular Surgeon on call.

Wt: __________ kg  Allergy: __________

1. While awaiting Transport or arrival of the STAT Vascular Team:
   - Abdominal CT with contrast if creatinine <1.6 otherwise without contrast
   - Cardiac Monitor
   - Oxygen at 2L/min via Nasal Cannula or intubate if hemodynamically unstable
   - Intubate if hemodynamically unstable
   - Start a second large bore IV DSNS KVO (all non-medication IVs should be KVO)
   - Stat labs: CBC, with Pt, BMP, Troponin, CK-MB, PT, INR, Magnesium
   - ECG
   - BHEG for females of child bearing age

2. Beta Blocker: Use as first line of defense to keep HR < 60 BPM & maintain SBP <100 mmHg
   - Esmolol (first choice for pts with dissection, asthma, or CHF): 1mg/kg IV bolus over 30 seconds followed by 150 mcg/kg/min infusion if needed. Adjust infusion rate to maintain desired HR and/or SBP up to 300 mcg/kg/min
   - Enalapril: 20 mg IV bolus, followed by 20-80 mg every 10 minutes, not to exceed 300 mg

3. Blood Pressure reduction (target SBP 80-100 mmHg): If SBP is >100 mmHg with good mentation despite beta blocker add either or both of these medications:
   - Nicardpine: starting dose is 5 mg/hr, may increase 2.5 mg/hr every 5 min (for rapid titration) or 2.5 mg/hr every 15 min (for gradual titration) up to a max dose of 15 mg/hr and 100 mg/hr.
   - Labetolol: 20 mg IV bolus, followed by 20-80 mg every 10 minutes, not to exceed 300 mg

4. Hypotension: If SBP falls below 80 mmHg discontinue Beta Blocker and Vasodilators.
   - Infuse 250 ml of IV fluid over 5-10 minutes. Titrate IV fluids to maintain SBP 80-100 mmHg.
   - If patient remains hypotensive start:
     1) Phenylephrine: IV bolus: 0.1-0.5 mg/dose every 10-15 minutes as needed IV infusion: 0.5 mcg/kg/min titrated to keep SBP 80-100 mmHg
     2) Norepinephrine: IV infusion: 0.5-3 mcg/min titrated to keep SBP 80-100 mmHg

5. Pain: Morphine Sulfate 2,4 mg IV with increments 2-8 mg every 5-15 min p.r.n.
   - Fentanyl 25 mcg IV every hour p.r.n.

6. Goal: Out the door < 45 minutes
PROCEDURE OVERVIEW

- Femoral artery access for the aortic cuff
- Axillary artery access for visceral chimneys
- Patent visceral vessels
• Axillary cutdown for axillary artery exposure
• Hemashield graft anastomosis for sheath access
• 3 x 7Fr sheaths in separate accesses
Bilateral renal arteries and SMA chimneys with Viabahn stents
Overlapping aortic cuffs: 28 x 49 Endurant and 32 x 49 Endurant
DISCUSSION

- High mortality rate
- Risk of pseudoaneurysm increases over time
- Inflammatory rind, difficult reoperative field
- Stent grafts also with complication risks: endoleaks, thrombosis, migration, rupture, infections
- Serial post-operative imaging
- Endovascular approach is an excellent option for pseudoaneurysm exclusion

