Subclavian and Axillary Artery Aneurysms

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DISCLOSURES

• None
CASE PRESENTATION

• 87 yo male awoken at 2am with abrupt onset of Right arm pain and numbness
  – Tried to sleep it off after taking advil
• Increased pain and some motor loss of hand
• Presented to outside hospital with “A-fib” in ambulance ride
  – Quickly transferred to University of Massachusetts for evaluation.
CASE PRESENTATION

• “Past Medical Hx”:
  – Benign prostatic hyperplasia
  – Hypertension
  – Hypothyroidism
  – Gout

• Past Surgical Hx:
  – Bilateral Total Knee replacements

• Social:
  – Quit smoking 30 years ago
  – Lives independently and uses stationary bike

• Physical Exam:
  – Normal Sinus Rythym
  – Decreased sensation in all digits with minimal weakness
  – Palpable mass in Right Axilla: Non-pulsatile
  – No palpable pulses in Right arm or hand
    • Weak monophasic palmer arch
OR

• Brachial artery exposure
  – Embolectomy of brachial and axillary artery
    • Fresh thrombus proximal and distal
  – Difficult passing catheter proximally
    • Continues thrombus
BY THE WAY...

• “Oh, I completely forgot. I had breast cancer and they did a surgery with radiation to my chest...I think both sides”
AXILLARY AND SUBCLAVIAN ARTERY ANEURYSMS

• Very rare peripheral artery aneurysms
  – Make up 0.13-1% of all peripheral aneurysms
    • Subclavian more common than axillary
    • Right vs. Left

• Associated with multiple signs and symptoms
  – Embolization

• Increased incidence over the last few decades
  – Fewer symptomatic

Pairolero et al. Surgery 1981
Hobson et al. Vito JST (eds) 1982
SUBCLAVIAN ARTERY ANEURYSM

• Then:
  – Mycotic, Syphilitic, Tuberculotic

• NOW:
  – Arterial Thoracic Outlet Syndrome
  – Degenerative
  – Pseudoaneurysm
  – Traumatic
  – Collagen Disorders
SUBCLAVIAN ARTERY ANEURYSM

• Proximal
  – Atherosclerosis
  – Collagen
  – Trauma

• Middle
  – Collagen
  – Trauma
  – Infection

• Distal
  – TOS
Axillary Artery Aneurysm

- Extremely Rare
- Younger & Athletic
- ...and the not so Athletic
  - Crutch Induced
- Anatomy
  - Tethering
PRESENTATION

• Most are Symptomatic
• Pain
  – Chest, Neck, Shoulder
• Pulsating Mass
• Embolism
• Thrombosis
• Brachial Plexus Neuralgia
• Other
  – Rupture, Hoarseness, Transient ischemic attack or Stroke, Horner syndrome, Dysphagia, Hemoptysis, venous congestion…
• Physical Exam
  – Pulsatile mass depending on location

• Imaging Studies
  – Angiography
  – CTA
  – MRI/A
  – US

Esteves FP et al. J Vasc Bras 2013
When to treat?

• No definitive size criteria
  – Size doesn’t matter…or does it?
• Natural History remains a mystery
• …Recommend repair of all aneurysms
OPEN SURGICAL TREATMENT

- Supraclavicular Approach
- Infraclavicular Approach
- Median Sternotomy
- Left Thoracotomy
- Along Vessel Course
- Combination of Above
- Irradiated Field

Complications:
- Nerve injury
- Ischemia
- Stroke
- Pulmonary Infection/Abscess

Mortality: 3-21%

ENDOVASCULAR TREATMENT SUCCESS??

• Complication rates
  – Access
  – Manipulation

• How is Success Measured?
  – Early success => 95%
  – Long-term success?
    • Patency
    • Reintervention

Beregi et al. Cardiovasc Intervent Radiol 1999
Schoder et al. J Endovasc Ther 2003
Esteves et al. Cardiovasc Intervent Radiol 1999
ENDOVASCULAR TREATMENT: WHY THE CONFUSION?

- NO Instruction For Use
- NO Industry or Institution Guidelines
- NO Large Prospective Studies
- NO Large Retrospective Studies
- NO FDA approved stent grafts for Upper extremity aneurysm
- NO Consistency in Stent Graft Utilization
  - Dacron, PTFE, Silicone, and Vein
ENDOVASCULAR TREATMENT CONSIDERATIONS

• Pre-operative planning
• Access Initial reports, lots of complications…
• Manipulation Anticoagulately immediately
• Seal zones 5mm-1cm
• Size discrepancy High variance in different segments
• Collateral Flow Importance and effects of covering?
• Adjunct Procedures Vertebral re-implantation?
• Operative Field Increased risk of graft infection?
• Location, location, location… Stent failure?

Ewings et al. Vasc Endovasc Surg 2008
Park et al. Interactive CardioVasc & Thoracic Surgery 2015
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