Infected Lower Extremity Aneurysms

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History

• 52F c PMHx of HTN, asthma p/w fever, malaise s/p one week of ABx for presumed pneumonia as outpt
  – Denies IVDU, ETOH
  – No previous history of rheumatic fever
• In ED was tachycardic, tachypneic.
  – WBC 15K, bandemia
  – Blood cultures 1 week prior + for s. agalactiae
  – Echo: thickening mitral leaflets, 5 cm & 2 cm vegetations
• Diagnosed with **infective endocarditis**
History

- RLE pain on 5/20, U/S + for calf vein thrombus
  - Started on anticoagulation
- Underwent uneventful MVR on 5/23
- Discharged home after 1 week on coumadin & ABx
  - Plan to follow up with vascular as outpatient

- Pt returned to UHB POD#33 c/o RLE pain x 2 days
  - Pain described as acute in onset, no paresthesias/LOS
Hospital Course

• Patient was admitted to vascular surgery
  – Blood cultures, continued on Abx
  – Repeat echo was within normal limits

• RLE angiogram was performed
Hospital Course

• On HD#3, taken to OR: contained ruptured aneurysm
  – Resection of infected popliteal aneurysm
  – SFA to PT bypass c non-reversed GSV

• Tolerated procedure well

• Transferred to stepdown postoperatively
  – Palpable PT pulse in right foot
Postoperative Course

• Workup initiated to r/o additional aneurysms
  – CT angiogram of chest/abdomen/pelvis obtained
  – 9 mm aneurysm of branch of superior mesenteric artery
  – Visceral angiogram performed, unable to visualize
  – Subsequent CT angiogram revealed thrombosis

• Patient did well, tolerated diet, + bowel function
• Transferred to acute rehab on antibiotics
Questions?
Background

• Arterial aneurysm infections predate antibiotic era

• In 1885, Osler coined term ‘mycotic aneurysm’
  – Used to describe beaded appearance of aneurysms

• Multiple etiologies since established
  – Treatment options improved, but incidence increasing
Types of Infected Aneurysms

• Mycotic Aneurysms
• Microbial Arteritis
• Infection of Existing Aneurysms
• Post-traumatic infected false aneurysms
• Syphilitic aortitis
• True fungal aneurysms
• Primary aortoenteric fistulae
Pathophysiology

- Larger arteries from septic emboli to vasa vasorum
  - Vessel wall ischemia, infection

- Smaller vessels emboli in lumen
  - Common in bifurcations
Bacteriology

- Mycotic aneurysms: *Strep, Staph*
- Bacterial arteritis: *E.coli, Salmonella*
- Infected pre-existing: *Staph*
- Post-traumatic pseudoaneurysm: *Staph*
Clinical Presentation

- Fever, vague pain (85%)
- Leukocytosis (65-85%)
- Pulsatile mass (50-65%)
- Rupture common
Which of the following is the initial diagnostic test of choice for popliteal artery aneurysm?

a) Magnetic resonance imaging (MRI)
b) Arteriography
c) Duplex ultrasonography
d) CT Angiogram
Imaging

• Ultrasound: size & location, unreliable for infection

• CT angiography: diagnostic test of choice
  – Saccular, irregular lumen, thickened wall, fluid/gas
  – Use of short-interval studies may be valuable

• MRI

• Indium-111 labeled WBC nuclear scan

• Angiography
Risk Factors

• Samore et al. independent risk factors
  – Duration of procedure
  – Number of catheterizations at the same site
  – Difficult vascular access
  – Arterial sheath in place > 1 day
  – Associated congestive heart failure
Which of the following statements regarding the treatment of popliteal artery aneurysm is false?

a) Bypass and exclusion of the aneurysm is safe and effective.

b) Resection and endoaneurysmorrhaphy is safe and effective.

c) The medial approach is the preferred route of exposure.

d) Endoluminal stent grafting may be indicated in a high-risk patient.

e) For acute thrombosis, surgical thrombectomy has a higher limb salvage rate than thrombolysis followed by surgical reconstruction.
Special Consideration

• IV drug users represent a distinct group
  – High rate graft infection
  – Reuse femoral access, jeopardize reconstruction
  – Best served by ligation?
Controversy over Management

- Padberg et al: Ligation is best
- Reddy et al.: Single vessel ligation OK
- Condemn patients to claudication (33%)
Alternatives

• Klonaris et al. report using internal iliac
  – 9 of 14 pts: IIA arterial reconstruction
  – 5 IIA used as patch, 4 as interposition graft
  – F/u median 19 mo (4-52): no complaints
What about Endovascular?

- Kan et al. (2007) discuss outcomes from 22 studies
  - 30-day survival rate was 89.6 +/- 4.4%
  - 2-year survival rate was 82.2 +/- 5.8%
  - Predictors of persistent infection: fever, rupture, age > 65
  - Protective factors: preop abx > 1 week, EVAR + drainage

- EVAR possible alternative, though only temporizing
Kritpracha et al (2011): Endovascular therapy for infected aortic aneurysms

- N=21, 17 abdominal, 4 thoracic aorta
- Mean age 66
- Divided into fistula (5) / non-fistula (16)

EVAR: good short/midterm patients s fistulae
Endovascular Tx in Infected Groins

• Only one study published to date
• Klonaris et al, 2009 report hybrid procedure:
  – N=6, 4 contained rupture, 2 with active bleeding
  – Stenting of infected femoral pseudoaneurysm
  – Debridement of pseudoaneurysm POD 1-3
  – 4 patients: sartorius muscle flap

• F/u (14.1 +/- 8.2 mo): no signs recurrent infection
• Emergent stent graft exclusion is viable alternative
Summary

• Break in artery wall + infection → aneurysm
• Infected arterial aneurysms require urgent attention
• Antibiotics, control of bleeding, debridement are key
• Revascularization through unininfected field
• Increasing rates of femoral pseudoaneurysms
• Must consider patient population with OR plan
Which of the following statements about post-catheterization false aneurysms is/are true?

a) Urgent surgical repair is indicated.
b) This aneurysm is likely to undergo spontaneous thrombosis if observed.
c) Spontaneous thrombosis is less common in patients who are anticoagulated.
d) They may cause deep venous thrombosis.
References

- Rutherford’s Vascular Surgery, 7th edition, Cronenwett et al. 2010