Penetrating Ulcers, IMH, Saccular Aneurysms: When to Treat

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Disclosures

• Fenestrated Case Proctoring, Cook Medical
Repair ?

**Observation:**
- Risk of Rupture
- Risk of death from rupture

**Repair:**
- Risk of Morbidity, Mortality,
  Secondary procedures
Penetrating Ulcer

IMH

Saccular Aneurysm
Definitions

• Aortic Dissection: Intimal tear with blood dissecting into the medial layer of the aortic wall
• Penetrating Ulcer: Defect in the elastic lamina of the aortic wall leading to localized medial disruption
• Intramural Hematoma: Collection of blood that is confined to the aortic media
• Saccular Aneurysm: Non-fusiform, asymmetric bulge, appearing on one side of the aorta.

Medical Treatment

• Aimed to reduce hemodynamic forces that can exacerbate condition
• IV antihypertensives (beta blocker + vasodilator) is initiated
  – Beta blocker is initiated first to avoid reflex sympathetic stimulation from direct vasodilatation
  – Goal HR < 80, Goal SBP < 120
• Patients should be admitted to the ICU for continuous BP monitoring, telemetry, and monitoring of UOP.
• Patients can be transitioned to oral anti-HTN medications when BP is stable and pain resolved.
• Medically treated patients need to be followed with serial CT scans
Penetrating Ulcer

- Defect in the elastic lamina leading to localized medial disruption and potential rupture
- Affect 2-3% of population
- 2-8% of acute aortic syndromes
- Most common location is descending aorta
- Hypertension most common comorbidity (92%)

Harris et al. JVS, 1994.

Penetrating Ulcer-Treatment

- Conservative
- TEVAR
- Open
Penetrating Ulcer-Presentation

- Pain (≈75%)
- Incidental finding (≈25%)

Penetrating Ulcer-Treatment

- Conservative
  - Harris et al: 1/3 progress to aneurysm
  - Cho et al: 1/3 progress to require treatment
  - Hussain et al: 80% resolution of PAU with no progression to aneurysm or rupture

Harris et al. JVS, 1994.
Hussain et al. JVS, 1989.
Penetrating Ulcer-Treatment

• Indications
  – Serial enlargement on interval scans
  – Persistent symptoms?

• Risk/Benefit
  – Length of coverage required
  – Side branch involvement
  – Relationship to arch

Penetrating Ulcer-Treatment

• Indications
  – Serial enlargement on interval scans
  – Persistent symptoms?

• Risk/Benefit
  – Length of coverage required-SHORT
  – Side branch involvement-NONE
  – Relationship to arch-DISTAL TO LSCA
Penetrating Ulcer - Treatment

• Indications
  – Serial enlargement on interval scans
  – Persistent symptoms?

• Risk/Benefit
  – Length of coverage required - LONG
  – Side branch involvement - VISCERAL/ARCH
  – Relationship to arch - PROX TO LSCA

Zones of the Aortic Arch
Potential Solutions

1. Hybrid repair
2. Total endovascular
3. Open

Hybrid Repair-Zone 1
Hybrid Repair-Zone 0
Aortic and total arch repair: endovascular or open repair

Single independent predictor of mortality: landing in Zone 0

Total Debranching (n=16)

Odds Ratio 30 day mortality

Odds ratio, 11.1, 95% CI, 1.86-15.45)
Innominate Branch: 12 mm

Left Carotid Branch: 8 mm

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Intramural Hematoma

- Intramural hematoma: A collection of blood confined to the aortic media
Etiology and Risk Factors

- Atherosclerotic plaque penetrates the internal elastic lamina, allowing hematoma formation within the media.
- Risk factors: age, hypertension, significant atherosclerotic disease
- Spontaneous rupture of vaso vasorum within the media (less likely) vs. PAU that is unseen on imaging studies

Treatment

- Natural history of asymptomatic disease is complete resolution in 50-80% of cases
- Some studies of IMH show a 16% progression to dissection on a second imaging study
- Mainstay of treatment is medical
- Indications for surgical treatment:
  - Aneurysmal degeneration
  - Rupture/impending rupture
  - Major progression in size despite medical therapy
History of Present Illness

- 59 y/o female in usual state of health developed acute onset of sharp, stabbing, back pain. No abdominal pain, no extremity pain.

Past Medical History

- HTN, HLD
Post TEVAR

2 years later
4 years later
(6 years total)
Questions

• Was TEVAR appropriate?
• Was the TEVAR treatment length appropriate?
• Was the timing of TEVAR appropriate?
• What is the natural history if we had not placed a TEVAR graft?
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Thank You.