Aortic Management: Medical vs. Open vs. Endovascular

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Aortic Dissection / Aneurysm

Treatment options:

- Medical Management
- Open Surgical repair
- Endovascular Repair
Location, Location, Location
Aortic Dissection

- Type A:
  - Type I
  - Type II
- Type B:
  - Type III
Clinical Manifestations

- Sudden onset of severe and tearing chest/back pain
  - Usually localized front or back
  - Interscapular region
  - Can radiate
- Usually distinguishable from musculoskeletal pain
- Can present with NSTEMI
Clinical Manifestations

- Abdominal pain
  - Very concerning if N/V
- Lower extremity ischemia
- Some can present with only mild pain or no pain.
Type A - Management

Medical Emergency:
- Patient’s can be hypertensive:
  - Need SBP < 120, HR < 80:
    - Anti-impulse therapy:
      - Beta blocker:
        - Esmolol
    - Calcium Channel blocker:
      - Cardene
If hypotensive, avoid inotropes:

- Determine cause of hypotension:
  - Rupture
  - Blood Loss
  - Tamponade
  - Heart Failure
  - Not titrating medications correctly
Type A - Management

- **Echo:**
  - Evaluate Ascending/Descending Aorta
  - Evaluate valve function:
    - Severe AI
- **EKG:**
  - Coronary involvement
  - Show AI


www.meddean.luc.edu
Type A - Surgery

Surgical emergency:
- Median sternotomy incision
- Cardiopulmonary bypass

Type A - Surgery

- Surgical approach:
  - Replace the Ascending with Dacron graft
  - Aortic valve may need replaced vs repair
  - May need hemiarch or total arch
  - Coronary bypass if involved in dissection
Type A - Surgery
Endovascular approach:
- Zone 0 TEVAR
- Only with clinical trial
- Anatomically correct
- High surgical risk patient’s only
Type B - Management

- Medically managed:
  - Blood pressure control
  - SBP < 120, HR < 80:
    - Anti-impulse therapy:
      - Esmolol - Initially
    - Cardene
  - Start oral medications as soon as possible
  - Pain Control

- Minimize aortic wall shear stress
Type B - Management

To Treat or not to Treat, that is the question...
Type B - Management

Uncomplicated Type B:
- No aneurysm
- No malperfusion
- No uncontrolled pain
- No end organ ischemia
- No peripheral ischemia
Type B - Management

- Some studies suggest TEVAR for all Type B dissections:
  - Remodeling of the aorta
  - Decrease later complications:
    - But still have immediate complications
- Some studies suggest Medical management:
  - Close follow-up and tight blood pressure control
  - Early intervention if becomes complicated

VS.
Type B - Management

- Study for stenting of asymptomatic Type B dissection
  - Randomized
  - Medical management vs TEVAR

Type B - Management

Long-term Management:

- Tight BP control:
  - SBP < 120, HR < 80, if patient can tolerate
    - Beta blocker, ACE, ARB
- Serial imaging:
  - CT scan vs MRI:
    - 3 or 6 months, 1 year, yearly
- No heavy lifting
- No extreme sports
- Heart healthy diet
- No Smoking
Type B - Surgery

Surgical management if remain symptomatic:

- Pain does not resolve
- End organ ischemia
- Extension of dissection
- Continued aortic expansion
- Impending rupture
- Bleeding into pleural space
Type B - Surgery

Endovascular – TEVAR:

- First line approach
  - Acute
  - Subacute
- Extent of coverage depends on entry tear of dissection
Type B – Surgery

https://www.jvascsurg.org/article/S0741-5214(11)02969-7/fulltext
Type B - Surgery

Surgical Management:

- Chronic Type B
- Open repair of anatomically not amendable to stenting
- Concern for infection
- Genetics:
  - Marfan, Ehlers Danlos, acta2
  - TGfb2
Aneurysm

- Medical Management
- Open Surgical repair
- Endovascular Repair
Aneurysm - Management

Medical management:
- **Tight BP control:**
  - SBP < 120, HR < 80, if patient can tolerate
  - Beta blocker, ACE, ARB
  - Decrease the rate of dilatation
- **Statins:**
  - Inflammatory effect
  - Some studies show a decrease in formation of aneurysms
  - Decreases aortic degeneration
Aneurysm - Management

Medical Management (con't):

- Smoking Cessation:
  - Patients with COPD have increased risk for TAAA
  - Smoking weakens the aortic wall

- Serial Imaging:
  - 6 m, 1 yr, yearly
  - CTA, MRI, Echo
Aneurysm - Surgery

Surgical intervention:
- Decrease the risk of rupture
- Usually intervene when aneurysm 5-5.5 cm
- May operate sooner
  - Genetic disease
  - Women due to smaller aortas
  - Symptomatic
Aneurysm - Surgery

Ascending/Arch:

- Open surgery:
  - Median sternotomy
  - Cardiopulmonary bypass
  - If severe AI – replace or repair aortic valve
  - Possible coronary artery bypass graft
Aneurysm - Surgery

Endovascular Repair:
- TEVAR - Zone 0 or 1
- If anatomically able
- May need to bypass innominate, L common carotid and L subclavian
- Only for high risk surgical patient’s
Open Repair:
- Young patient’s
- Genetic disease:
  - Marfans, Ehlers Danlos, Acta 2, TGFB2
- Infection
DTAA / TAAA

Surgical Approach:

- Thoracoabdominal incision
- Lumbar drain
- Distal Aortic perfusion:
  - L atrium/L CFA cannulated
- Renal protection
DTAA / TAAA

Endovascular approach – TEVAR:

- If anatomically able
- Good Landing zones
- Mesenteric arteries
- Kidney Function
- Becoming more popular
- Quicker recovery
- Life long monitoring
Surveillance

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