State Of The Art Aortic Emergencies – Endovascular Therapy

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Aorta

- Largest artery in the body.
- Carries oxygen-rich blood away from the heart.
- Elastic (especially ascending aorta).
- 3 layers of tissue
  - Thin inner layer: tunica intima
  - Thick middle layer: tunica media
  - Thin outer layer: tunica adventitia
Acute aortic syndromes consist of 3 inter-related conditions with similar clinical characteristics:

- Aortic dissection
- Intramural hematoma (IMH)
- Penetrating aortic ulcer (PAU)
European Society of Cardiologists’ classification of acute aortic syndrome

<table>
<thead>
<tr>
<th>Classification</th>
<th>Pathology</th>
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</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>Classic dissection with true and false lumens separated by the dissecting membrane</td>
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<td>Type 2</td>
<td>Intramural haematoma</td>
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<td>Type 3</td>
<td>Discrete dissection with a bulge at the tear site but no haematoma</td>
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<td>Type 4</td>
<td>Penetrating aortic ulcer</td>
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<tr>
<td>Type 5</td>
<td>Traumatic or iatrogenic dissection</td>
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</table>
Aortic Dissection

- Most common aortic catastrophe
- Incidence - 5 to 30 per 1 million people/year
- Primary tear in aortic intima with bleed into diseased media (degeneration)
- Rupture of vasa vasorum - Hemorrhage in aortic wall with subsequent intimal disruption
Debakey

Type I

Type II

Type IIIa

Type IIIb

Stanford

dissection of aorta
Aortic Dissection

- Type A dissection often begins just above the coronary arteries where the aorta is the largest and thinnest.
  - Almost always a surgical emergency.
- Type B dissection involves the distal aorta.
  - Medically managed (unless complicated).
Signs/Symptoms

- Sudden onset of sharp, tearing pain radiating to the back.
- Syncope.
- Acute CHF.
- Other vague non-specific symptoms.
Physical Exam Findings

- Hypoxia
- Altered mental status
- Tachycardia
- Pulse deficits
- BP discrepancies
- Shock
Establish presence of AD or variant (IMH, PAU)

2 Location of the dissection (Type A, Type B)

3 Anatomical features
   a Extent of dissection
   b Sites of entry and reentry
   c False lumen patency, partial thrombosis, thrombosis

4 Complications of dissection
   a Type A
      i Aortic regurgitation
      ii Coronary artery involvement
      iii Pericardial effusion/hemopericardium
   b Aortic rupture or leaking
   c Branch vessel involvement
   d Malperfusion
### Management

| Surgical Therapy | Acute type A aortic dissection  
|                 | Retrograde dissection into ascending aorta |
| Surgical Therapy and/or Endovascular Therapy | Acute type B aortic dissection complicated by  
|                                               | • Visceral ischemia  
|                                               | • Limb ischemia  
|                                               | • Rupture or impending rupture  
|                                               | • Aneurysmal dilation  
|                                               | • Refractory pain |
| Medical Therapy | Uncomplicated type B aortic dissection  
|                 | Uncomplicated isolated arch dissection |
Complicated Acute Type B Dissection

- Complications such as malperfusion, shock – mortality rate is **25-50%**

- Conventional open surgery – 30-day mortality of **30%**

- Meta-analysis has shown that endovascular treatment (TEVAR) – 30-day mortality of **9.8%**

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Endovascular Stent-graft in type B-Dissection (TEVAR)
Case 1

55 y.o. female presented with severe abdominal pain and vomiting.

**CT abdomen**: Type B AD, false lumen extending into celiac arteries, SMA
Case 2

48 y.o. male presented with severe refractory chest pain.

**CT abdomen:** Type B AD, false lumen starts at origin of left subclavian artery.
QUESTIONS ?

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