Multimodality Imaging of Diseases of the Thoracic Aorta in Adults

Echo Florida 2017

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Aortic Disease

Acute
• Dissection
• Ulceration
• Hematoma
• Rupture
• Expansion

Chronic
• Marfans/LDS
• Bicuspid AoV
• Coarctation
• Aneurysms
• HTN/ASCD
Q1

A Type B aortic dissection is defined as a dissection that involves:
A. Aortic arch
B. Ascending aorta
C. Aortic arch and descending aorta
D. Descending aorta
• Ascending Ao
• Ao Arch
• Descending Ao
• Branch arteries
• Ao valve

DeBakey classification

Stanford classification

Q2

- Repair of an asymptomatic ascending aneurysm is indicated for an aneurysm of:
  A. 4.0cm
  B. 4.5cm
  C. 5.0cm
  D. 5.5cm
  E. 6.0cm
Q2

- Repair of an asymptomatic ascending aneurysm is indicated for an aneurysm of:
  A. 4.0cm
  B. 4.5cm
  C. 5.0cm
  D. 5.5cm
  E. 6.0cm

TTA: Size Matters

<table>
<thead>
<tr>
<th>Condition</th>
<th>Minimum Size</th>
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<tbody>
<tr>
<td>Symptomatic</td>
<td>Any size</td>
</tr>
<tr>
<td>Asymptomatic Asc</td>
<td>≥5.5cm</td>
</tr>
<tr>
<td>Degenerative</td>
<td>≥5.5cm</td>
</tr>
<tr>
<td>Genetic Syndrome</td>
<td>4.0 – 5.0cm</td>
</tr>
<tr>
<td>BAV</td>
<td>≥5.5cm</td>
</tr>
<tr>
<td></td>
<td>≥5.0cm if additional RF</td>
</tr>
<tr>
<td></td>
<td>≥4.5cm if surgery for valve</td>
</tr>
<tr>
<td>Asymptomatic Arch</td>
<td>≥5.5cm</td>
</tr>
<tr>
<td>Asymptomatic Desc</td>
<td>≥5.5cm</td>
</tr>
<tr>
<td>Low risk</td>
<td>≥5.5cm</td>
</tr>
<tr>
<td>High risk</td>
<td>≥6.0cm</td>
</tr>
</tbody>
</table>
Relative Comparison of Modalities for Aortic Imaging

<table>
<thead>
<tr>
<th></th>
<th>TTE</th>
<th>TEE</th>
<th>CT</th>
<th>MRI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portability</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Coverage</td>
<td>-</td>
<td>+/-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Sedation</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Multiplanar Recon</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Contrast</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Radiation</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Speed</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Ao Valve</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>

TEE: Transesophageal Echocardiography
TTE: Transthoracic Echocardiography
CT: Computed Tomography
MRI: Magnetic Resonance Imaging

CTA: Contrast-Enhanced Ultrasound
MRI: Magnetic Resonance Imaging
Speed: Ultrasound speed
Ao Valve: Aortic Valve
Valve: Valve assessment
Speed: Speed of echocardiography
Coverage: Coverage of imaging
Non Con: Non-invasive imaging
No rad: No radiation
No sedation: No sedation
MPR: Multiplanar Reconstruction

Intramural Hematoma

Aortic Dissection

- 80 y/o male s/p 2V CABG 3 weeks ago
- P/w Dizziness and weakness
- TTE
TTE

CTA
Bicuspid Aortic Valve
MRA
Aortic Insufficiency

35 y/o female with sudden onset dyspnea
Coarctation
4D Flow

Summary

- Comprehensive aortic imaging requires a multimodality approach.
- Choose imaging based on acuity and what your institution does well.
- Don’t forget the valve & don’t forget the aorta.