Population Covered By The Guidance

This pathway provides guidance for imaging adult patients with suspected non-traumatic aortic dissection.

Date reviewed: January 2012
Date of next review: January 2015

Quick User Guide

Move the mouse cursor over the PINK text boxes inside the flow chart to bring up a pop up box with salient points. Clicking on the PINK text box will bring up the full text. The relative radiation level (RRL) of each imaging investigation is displayed in the pop up box.

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>RRL</th>
<th>EFFECTIVE DOSE RANGE</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>None</td>
<td>0</td>
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<tr>
<td></td>
<td>Minimal</td>
<td>&lt; 1 millisieverts</td>
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<tr>
<td></td>
<td>Low</td>
<td>1-5mSv</td>
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<tr>
<td></td>
<td>Medium</td>
<td>5-10 mSv</td>
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<tr>
<td></td>
<td>High</td>
<td>&gt;10 mSv</td>
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</table>

Pathway Diagram
Aortic Dissection - Type A

Image 1 (CT Angiography): Stanford type A Aortic Dissection involving the ascending and descending thoracic aorta (arrows).

Teaching Points

- Stanford classification of Aortic Dissection:
  - Type A dissection includes the ascending aorta.
  - Type B dissection does not involve the ascending aorta (ie. distal to left subclavian artery).
- A chest radiograph is useful in excluding other causes of chest pain. A normal chest radiograph...
does not exclude the diagnosis of Aortic Dissection.

- Contrast enhanced spiral CT scan is the initial investigation of choice for the evaluation of suspected spontaneous Aortic Dissection.

### Computed Tomography (CT)

- Contrast enhanced spiral CT scan is the initial investigation of choice for the evaluation of suspected spontaneous aortic dissection. **1**
- Comparable accuracy to that of MRI and transoesophageal echocardiography (TOE) with sensitivity and specificity approaching 100%. **2-4**
- Superior to TOE and MRI in the assessment of aortic arch vessel involvement. **2**
- The diagnosis is based on the demonstration of an intimal flap, which separates the true from the false channel. Secondary findings include internal displacement of intimal calcifications, delayed enhancement of the false lumen and aortic widening. **1,5**
- Atypical forms of aortic dissection can also be recognised eg. intramural haematoma, penetrating atherosclerotic ulcer and atypical configurations of the intimal flap. **1,6**
- CT findings of: type A intramural haematoma, maximum thickness of haematoma, compression of true lumen, and pericardial or pleural effusion, can predict the progression of aortic intramural haematoma to aortic dissection. **7**

**Advantages:** **1,3**
- Non-invasive, rapid test.
- Widely available.
- Allows distinction of type A from type B aortic dissection.
- Allows imaging of the entire aorta and demonstrates the extent of involvement and organ ischaemia.
- Permits follow-up of aortic dissection, aneurysm or intramural haematoma.

**Limitations:** **1,3,4**
- Does not provide information regarding the coronary arteries or aortic valve, although multislice CT shows promise in this area and further studies are required.

**Disadvantages:**
- Exposure to ionising radiation.
- Use of iodinated contrast material.

### Chest Radiography

- Radiographic abnormalities that may suggest Aortic Dissection include
  - Widened mediastinum
  - Widening of the aortic contour
  - Difference in the diameter between the ascending and descending aorta
  - Blurring of the aortic margin secondary to local extravasation of blood
  - Unilateral/Bilateral pleural effusion
  - Separation of intimal calcification
- A literature review reported the accuracy of various radiological abnormalities in the detection of spontaneous Aortic Dissection;
  - Abnormal aortic contour - sensitivity 61% (95% CI 56-85)
  - Pleural effusion - sensitivity 16% (95% CI 12-21)
  - Displaced intimal calcification - sensitivity 9% (95% CI 6-13)
  - Widened mediastinum - sensitivity 64% (95% CI 44-80)
Abnormal chest radiograph - sensitivity 90% (95% CI 87-92)
However the review consisted mainly of retrospective studies, which may have biased the results and over predicted the usefulness of chest radiography in diagnosis of spontaneous Aortic Dissection.

A chest radiograph is useful in excluding other causes of chest pain. A normal chest radiograph does not exclude the diagnosis of Aortic Dissection.

Magnetic Resonance Imaging (MRI)
- Comparable accuracy to that of CT and transoesophageal echocardiography. 2,4
- Advantages: 2,4
  - Provides excellent visualisation of tear localisation, aortic regurgitation, side branch involvement and complications.
  - No exposure to ionising radiation.
  - Non-invasive.
- Limitations: 2,4
  - Expensive.
  - Limited availability.
  - Long examination time.
  - Difficulty of monitoring haemodynamically unstable patients (limited access to the patient).
  - Contraindicated in patients with pacemakers/certain heart valve prostheses.

Transoesophageal Echocardiography (TOE)
- Comparable accuracy to that of CT for detection of Aortic Dissection. 2,4,8
- Advantages: 2,4,8
  - Can be performed at the bedside of critically ill patients.
  - Allows functional cardiac assessment.
  - Permits detection of coronary artery involvement.
- Limitations: 2,4,8
  - Invasive.
  - Limited availability and/or expertise.
  - Obscuration of the proximal aortic arch by interference from air within the trachea.
  - Lack of visualisation of the abdominal aorta (the distal extent of the dissection may not be seen if it involves the abdominal aorta).

Aortic Dissection
- Predisposing factors for spontaneous Aortic Dissection include;
  - Systemic hypertension
  - Bicuspid aortic valve
  - Coarctation of the aorta
  - Marfan's syndrome
  - Ehlers-Danlos syndrome
  - Turner syndrome
  - Giant cell arteritis
  - Third trimester pregnancy
  - Cocaine abuse
• Stanford classification of Aortic Dissection:
  1. Type A dissection includes the ascending aorta.
  2. Type B dissection does not involve the ascending aorta (ie. distal to left subclavian artery).
• Type A dissections are usually surgical emergencies owing to the high risk of acute aortic regurgitation, occlusion of coronary arteries and pericardial rupture.

References


Further Reading


Information for Consumers

<table>
<thead>
<tr>
<th>Information from this website</th>
<th>Information from the Royal Australian and New Zealand College of Radiologists’ website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consent to Procedure or Treatment</td>
<td>Computed Tomography (CT)</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Radiation Risks of X-rays and Scans</td>
<td>Contrast Medium (Gadolinium versus Iodine)</td>
</tr>
<tr>
<td>Computed Tomography (CT)</td>
<td>Gadolinium Contrast Medium</td>
</tr>
<tr>
<td>Magnetic Resonance Imaging (MRI)</td>
<td>Iodine-Containing Contrast Medium</td>
</tr>
<tr>
<td>Ultrasound</td>
<td>Magnetic Resonance Imaging (MRI)</td>
</tr>
<tr>
<td>Chest Radiograph (X-ray)</td>
<td>Plain Radiography/X-rays</td>
</tr>
<tr>
<td></td>
<td>Radiation Risk of Medical Imaging During Pregnancy</td>
</tr>
<tr>
<td></td>
<td>Radiation Risk of Medical Imaging for Adults and Children</td>
</tr>
<tr>
<td></td>
<td>Ultrasound</td>
</tr>
</tbody>
</table>

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