Aortic Dissection

- An aortic dissection is **a serious condition in which a tear occurs in the inner layer of the body's main artery (aorta)**. Blood rushes through the tear, causing the inner and middle layers of the aorta to split (dissect).

- *Remember*: patients (especially those with hypertension) with sudden severe chest and/or back pain may have acute aortic dissection.

Pathology

- Aortic dissection is longitudinal splitting of the muscular aortic media by a column of blood. The dissection may spread proximally (possibly resulting in aortic incompetence, coronary artery blockage, cardiac tamponade) or distally (possibly involving the origin of various arteries), or rupture internally back into the aortic lumen or externally (eg into the mediastinum, resulting in rapid exsanguination).

- More than 70% of patients have a history of hypertension.
- It occurs more frequently in those with a bicuspid aortic valve, Marfan's syndrome, or Ehlers–Danlos syndrome. Up to 20% follow recent cardiac surgery or recent angiography/angioplasty.
- Dissection may be classified as Stanford type 'A' or 'B', according to whether the ascending aorta is involved or not, respectively.

History

- Aortic dissection may mimic an MI, so adopt a high index of suspicion.
- It typically presents with abrupt-onset sharp, tearing, or ripping pain (maximal at onset) in the anterior or posterior chest. The pain can resolve, then recur in the epigastrium or elsewhere.
- Pain migration may reflect dissection extension. Sometimes the patient is pain-free after the initial insult.

History

- Syncope occurs in 710%, sometimes without any pain. Occasionally, patients present with an acute stroke, with neurological deficit plus chest pain. Involvement of the coeliac artery can cause bowel ischaemia.

- Likewise, involvement of the renal arteries can cause acute kidney injury (AKI).

Examination

- The patient is usually apprehensive and distressed, with pain which is difficult to alleviate, even with using IV opioid. Clues to the diagnosis include:
  - An aortic regurgitation murmur (30%).
  - Asymmetry or absence of peripheral pulses or a pulse deficit.
  - Hypertension.
  - Hypotension with features of tamponade or neurological signs in association with pain (eg secondary to spinal/carotid artery involvement).

Investigations

- Send blood for U&E, glucose, FBC, coagulation, and cross-matching.

Obtain an ECG and a CXR. Thoracic aortic dissection usually results in an abnormal CXR. One or more of the following changes may be seen:

- A widened or abnormal mediastinum (present in 775%).
- Left pleural effusion (720%).
- Deviation of the trachea or nasogastric (NG) tube to the right.
- A ‘double-knuckle’ aorta and/or separation of the two parts of the wall of a calcified aorta by >5mm (the ‘calcium sign’).

- The ECG may show MI, LVH, or ischaemia. *Note*: 712% of patients with aortic dissection have a normal CXR and 730% have a normal ECG.

- **CT angiography will provide the definitive diagnosis.**

Differential diagnosis

- Aortic Regurgitation
- Aortic Stenosis
- Cardiogenic Shock
- Pleural Effusion
- Mechanical Back Pain
- Myocardial Infarction
- Myocarditis
- Pleural Effusion
- Pulmonary Embolism (PE)
- Thoracic Outlet Syndrome

Management

- On suspicion of an aortic dissection:
  - Provide O2 by face mask as appropriate (see % Oxygen, p. 99).
  - Insert two large-bore (14G) IV cannulae and cross-match for 6U.
  - Give IV morphine and titrate according to response (± antiemetic).

Management

- On suspicion of an aortic dissection:
  - Call the cardiothoracic team and the cardiologist at an early stage.
  - Insert an arterial line (preferably right radial artery), and discuss with specialist teams how to control the BP (eg labetalol infusion).
  - Arrange further investigation based upon specialist advice and available resources (eg aortography, echocardiography, CT scan, MRI).

Management

- Type A dissections are usually treated surgically; type B lesions are usually treated medically.

Prognosis

- Hospital-based mortality for aortic dissection is approximately 30%.
- Patients with type A aortic dissection who undergo surgical treatment have a 30% mortality; patients who receive medical treatment have a 60% mortality.
- Comorbidities and advanced age can pose a contraindication to surgery in selected patients.
- Medically treated patients with type B dissection have a 10% mortality; surgically treated patients with type B dissection have a 30% mortality.