Aortic Dissection

**Defn:** The most common catastrophe of the aorta

**Signs:**

1. Chest pain is the most frequent presenting complaint:
   - May be ripping or tearing in nature
   - Pain may migrate
   - Chest pain is of sudden onset (a key feature in distinguishing it from ischaemic pain)
   - Maximal at onset
   - Location of pain may indicate where the dissection arises (anterior chest pain is associated with anterior dissection & may result from coronary occlusion; jaw or neck pain occurs with extension into the great vessels; interscapular pain occurs with dissection of the descending aorta)

2. Blood pressure:
   - May increase or decrease
   - Hypotension is an ominous sign and may result from excessive vagal tone, cardiac tamponade or hypovolaemia from rupture of dissection
   - 20 mmHg differential in an independent predictor of aortic dissection

3. Neurological deficits:
   - Peripheral nerve ischaemia can cause numbness & tingling in the extremities
   - Dysphagia (from tracheobronchial compression)
   - Hoarseness from recurrent laryngeal nerve compression has been described

4. SVC syndrome

5. Cardiac tamponade

6. New diastolic murmur

7. Asymetrical pulses (carotid, brachial and femoral)

8. Findings of haemothorax if ruptures

**Investigation:**

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**Treatment:**

1. Oxygen & large bore iv access
2. Pain relief
3. Initiate aggressive management of heart rate & blood pressure (HR<60-80 & BP <100-120 systolic)
4. Urgent surgical intervention is indicated for type A dissection
5. Type B dissection may be managed surgically, radiologically or medically

**Disposition:**

1. Mortality is 1-2% per hour for the first 24-48 hours
2. Untreated 33% die in 24hrs, 50% within 48hrs & mortality approaches 75% in patients with undiagnosed ascending aortic dissection
3. Initial consultation with cardiology & later with cardiothoracic surgeon

**Aetiology:**

1. Types:
   - Type A involves the ascending aorta
   - Type B does not involve the ascending aorta

2. Risk factors:
   - Connective tissue disorders (Marfan's, Ehler's-Danlos, adult polycystic kidney disease)
   - Vascular disease risk factors (smoking, hypertension, dyslipidaemia)
   - Structural anomalies (bicuspid aortic valve, coarctation)
   - Pregnancy
   - Syphilis
   - Recent cardiac catheterisation increases risk of iatrogenic dissection

**Pathophysiology:**

- Breakdown of collagen, elastin and smooth muscle (cystic medial necrosis) occurs with aging, occlusive atherosclerosis of the vasovasorum & Marfan syndrome

**Classification:**

1. Stanford classification:
   - Type A involves the ascending aorta
   - Type B does not involve the ascending aorta

2. DeBakey classification:
   - Type I involves ascending aorta, arch & descending aorta
   - Type II is confined to the arch
   - Type III is confined to the descending aorta distal to the left subclavian artery

**Risk factors:**

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**Symptoms:**

1. Chest pain is the most frequent presenting complaint:
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2. Other presenting symptoms include:
   - Neurological symptoms
   - Syncope
   - Altered mental status
   - Limb paraesthesias, pain or weakness
   - Dysphagia (from tracheobronchial compression)
   - Horner's syndrome
   - Flank pain if the renal artery is involved
   - Dyspnoea and haemoptysis if the dissection ruptures into the pleura

**Erectile dysfunction**

- May occur from compression of SVC by aorta

**Diagnosis:**

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**Investigation:**

1. Bloods:
   - Leukocytosis may be present
   - Cr is elevated if dissection involves the renal arteries
   - Trop is elevated if dissection has caused myocardial ischaemia
   - Decreased Hb suggests leak or rupture
   - A-ve D-dimer makes diagnosis very unlikely

2. Imaging:

   -plain radiography
   -CT aortogram
   -CT dissection
   -MRI and angiography

3. ECG:
   - ST elevation occurs with coronary involvement
   - Right coronary dissects most commonly

4. Echocardiography:
   - TTE is good for evaluating AR and tamponade; it is less sensitive than CT
   - TOE is advantageous because patient does not need to be transported & because it detects involvement of the coronaries, AR & tamponade; it can give false positives and false negatives due to fact upper ascending aorta and arch may not be well visualised

5. Radiograph:
   - Mediastinal widening of greater than 8cm on AP chest radiograph
   - Blunted aortic knuckle
   - Ring sign (displacement of aorta >5mm past calcified intima is specific)
   - Left apical cap
   - Tracheal deviation
   - Deviation of the left mainstem bronchus
   - Oesophageal deviation
   - Loss of parastrachal stripe

6. CT aortogram:
   - Advantages are that it details the anatomy and helps surgical planning
   - Disadvantages are transport of unstable patient out of ED, need for contrast often with impaired renal function

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