aortic dissection [created by Paul Young 02/10/07]

defn
- the most common catastrophe of the aorta
- 2-3Xs more common than rupture of the abdominal aorta

aetiology
Classification:
(i) Stanford classification:
- type A involves the ascending aorta
- type B does not involve the ascending aorta
(ii) 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

Pathophysiology:
- breakdown of collagen, elastin and smooth muscle (cystic medial necrosis) occurs with aging, occlusive atherosclerosis of the vasavasorum & Marfan syndrome

Risk factors:
(i) CT disorders (Marfans, Ehlers-Danlos, adult polycystic kidney disease)
(ii) vascular disease risk factors (smoking, hypertension, dylipidaemia)
(iii) structural anomalies (bicuspid aortic valve, coarctation)
(iv) pregnancy increases risk
(v) syphillus
(vi) recent cardiac catherisation increases risk of iatrogenic dissection

symptoms
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 in part from coronary occlusion; jaw or neck pain occurs with extension into the great vessels; interscapular pain occurs with dissection of the descending aorta)

2. other presenting symptoms include:
- neurological symptoms
- syncope
- altered mental status
- limb paraesthesias, pain or weakness
- dyspnoea (from tracheobronchial compression)
- dysphagia (from oesophageal compression)
- orthopnoea
- flank pain if the renal artery is involved
- dyspnoea and haemoptusis if the dissection ruptures into the pleura

signs
1. 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
- 20mmHg differential in an independent predictor of aortic dissection
2. Neurological deficits:
- peripheral nerve ischaemia can cause numbness & tingling in the extremities
- hoarseness from recurrent laryngeal nerve compression has been described
- Horners syndrome
3. SVC syndrome
- may occur from compression of SVC by aorta
4. cardiac tamponade
5. new diastolic murmur
6. assymetrical pulses (carotid, brachial and femoral)
7. findings of haemothorax if ruptures

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
- X-match

2. imaging:

(i) plain radiography
- 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 paratracheal stripe

(ii) 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

(iii) echocardiography
- TTE is good for evaluating AR and tamponade; it is less senstive 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

(iv) MRI and angiography

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

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
- mortality is 1-2% per hour for the first 24-48 hours
- untreated 33% die in 24hrs, 50% within 48hrs & mortality approaches 75% in patients with undiagnosed ascending aortic dissection

initial consultation with cardiology & later with cardiothoracic surgeon