Managing an older man with a thoracic aortic aneurysm

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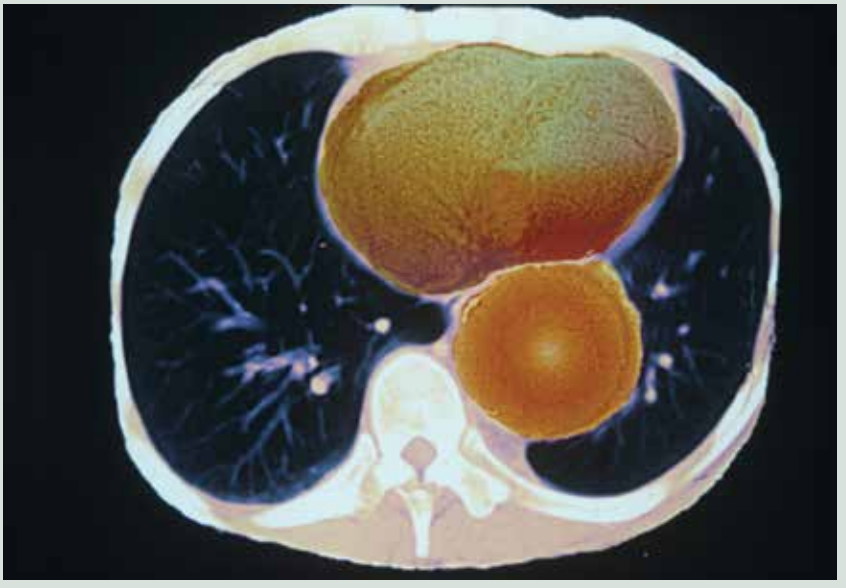
GP emergency management articles use cases to illustrate the emergency management of patients presenting in general practice with cardiac problems. They are inspired by, but not based on, real patient situations.

Hans is 68 years old and a regular patient of your practice associate who is currently on holiday. Hans comes to see you about two of his toes on his left foot and one on his right foot because they are tender and have a bluish-black area extending over the pulp.



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Hans has no medical problems known and stopped smoking 10 years ago when he remarried. He has about three alcoholic drinks most nights and takes no medications, although his blood pressure has been moderately raised at several consultations in the past year. His blood tests have shown mild to moderate hypercholesterolaemia and a normal blood glucose level in the past. He says his right second and third toes have been tender for the past few days, and that the discolouration on the end of each toe started overnight like a dark bruise and has not changed much.

What are the differential diagnoses of Han's presentation at this point?

Answer: *Hans could have a traumatic injury, bruising from ill-fitting shoes, mild haemorrhage into blisters or he might have an embolic phenomenon (bacterial endocarditis, emboli secondary to atrial fibrillation or from the endothelium of a diseased major artery or, rarely, a venous thromboembolism via a patent ductus or ventricular septal defect).*

You examine Hans. What are the most important aspects of your examination in light of his presentation?

Answer: *Is he febrile, does he have a normal blood pressure and pulse rate, has he any heart murmurs or carotid bruits, is his apex beat normal, are the pulses in his lower limbs normal (including specifically possible aneurysms or bruits of his popliteal and inguinal fossae), has he any signs of an abdominal aortic aneurysm or any bruits in his abdomen? Are his toes the only areas affected? Are his fingers and hands normal? Does he have trophic changes in his nails or the skin of his toes? Are these black areas at risk of ulceration and are they infected?*

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Hans has damaged feet (flaky, dry skin, early onychomycosis in some nails and cracked heels). The blackened areas are tender but have not ulcerated and are not raised under the skin. The skin around them is cool and pale. They look embolic and do not blanch with pressure. He has a normal sinus rhythm, cardiac examination and peripheral pulses. He has a nontender, prominent aortic pulsation with no mass palpable and no bruit. His abdominal examination is otherwise normal apart from this and some abdominal obesity.

On the basis of these findings, what investigations should be organised?

Answer: *Hans needs an urgent CT scan with contrast of his abdomen and chest to exclude an aortic aneurysm (thoracic or abdominal), even though he has no mass, tenderness or bruit. Contrast should only be used if his renal function has been normal in the recent past and there is no history of contrast allergy (if there is any doubt, a noncontrast scan should be arranged instead). If this investigation cannot be done urgently in private practice, Hans should be referred to hospital immediately for review there. If no aortic or femoral aneurysm is found, popliteal aneurysms should be considered. He will need a dipstick urinalysis and urgent measurements of electrolyte, urea and creatinine levels (to document current renal function if this is not already known before the scan with contrast).*

Other tests that would be reasonable include those that should be done as a preoperative work up, usually arranged in hospital. Preoperative tests are not urgent and include a full blood count, liver function tests, measurement of blood glucose levels and an ECG. However, the CT scan with contrast of the aorta is the most important investigation.

You discuss the possible diagnosis with Hans and why these urgent investigations are required. He tells you his father died of an aortic aneurysm in his early 70s. Is this relevant?

Answer: *Yes, it is. A family history of an aortic aneurysm is a known risk factor for first-degree relatives.*

What are the other risk factors for aortic aneurysms?

Answer: *Male gender, a history of smoking, age over 50 years (most patients are over 60 years), hypertension, hypercholesterolaemia, atherosclerosis, connective tissue diseases such as Marfan syndrome and, uncommonly, infection (classically syphilis) or abdominal trauma.*

Hans has a younger brother and a son. If Hans has an abdominal aortic aneurysm diagnosed, should they too be screened for abdominal aortic aneurysms by ultrasound and, if so, at what age? Should his wife and brother-in-law be screened too?

Answer: *The UK and USA both have screening programs in the form of an ultrasound for detecting abdominal aortic aneurysms in asymptomatic men at age 65 years and this has been proven to be cost effective. Australian studies suggest that such screening in this country will also reduce mortality and is cost effective. A one-off screening has been proposed for men between the ages of 65 and 74 years; however, this recommendation has not actually been implemented.[1] It is the opinion of the author that, because of their family history, Han's first-degree male relatives should be screened when they reach 65 years of age. If they also have hypertension, a history of smoking, hypercholesterolaemia, atherosclerosis or diabetes, they should be screened at age 60 years. The brother-in-law should discuss screening with his own doctor. If he is at increased risk compared with others his age and sex, or if he were concerned about his risk, it would be reasonable to screen him once between the ages of 65 and 74 years.*

As women have one-fifth the risk of developing an aortic aneurysm compared with men, routine screening is not recommended for Hans' wife (although women do have a worse outcome if they develop an aortic aneurysm).[2]

What are the signs and symptoms of a dissecting or rupturing aortic aneurysm?

Answer: *Back pain, abdominal pain, leg pain and numbness from nerve root compression, hoarseness (in the case of a thoracic aortic aneurysm*

Key points

- **Embolism in the periphery is often tender and peripheral pulses may be normal. The sources of potential emboli should be considered.**
- **Patients should be referred urgently to a vascular surgeon or hospital if an aortic aneurysm is suspected.**
- **A family history of an aortic aneurysm is a known risk factor for the first-degree relatives.**
- **In patients with a known aortic aneurysm, screening is usually performed every six months in the absence of new symptoms.**
- **Surgery is preferable to observation if the aortic aneurysm is showing signs of complications or if it is greater than 5.5 cm in diameter in men or 5.0 cm in women.**

as it can compress the recurrent laryngeal nerve), cough, tracheal deviation, haematemesis or haemoptysis (from pressure erosion of the aneurysm against the lung or oesophagus), flank ecchymosis, feeling of impending doom, sweating, clammy skin, pallor, nausea, faintness and collapse. Sudden death is a common presentation, sometimes preceded by back or chest pain.

Under what circumstances is surgery of an aortic aneurysm preferable to observation?

Answer: *Screening is usually performed every six months in the absence of new symptoms. Surgery is preferable to observation if the aneurysm is showing signs of complications (e.g. possible dissection or rupture, embolisation, renal or aortic valve involvement, pressure damage of adjacent structures), if it is extensive (e.g. thoracoabdominal aortic aneurysms); if it is rapidly enlarging between investigations; if it is greater than 5.5 cm in diameter for men (or 5.0 cm for women) as the risk of rupture begins to outweigh the risk of conservative management in most cases.*

Outcome

Hans was referred immediately to hospital where he had an urgent CT scan of his abdomen and chest. This showed a descending thoracoabdominal aortic aneurysm of 5.5 cm at its largest diameter that did not involve the renal arteries. Hans proceeded to CT scan with contrast. This confirmed a type 1 descending thoracic aortic aneurysm (from the left subclavian artery to above the renal arteries). It had an irregular fusiform lumen and a maximal diameter of 6 cm. There was no evidence of rupture. The arteries in his limbs were also assessed and did not require any intervention. The emboli were considered to have come from the lumen of the aneurysm.

Hans underwent vascular surgical review and was managed surgically. After discharge, Hans' medication included candesartan 8 mg daily and atorvastatin 80 mg daily. He was advised he was not to drive for four weeks.

References

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