A patient with chest pain

Peter Ruygrok
Case – Mr S

- 54 year old male
- No significant past medical history
  - Anxiety
  - Psoriasis
  - Colitis

Risk factors For CVD
- Father suffered MI aged 59
- Hyperlipidaemia – LDL 3.1, total 5.0
- Borderline hypertension
Mr S

- Chest tightness – across upper chest
- Usually at rest – in chair
- Some SOBOE
- Walks 2-3 km/day – no symptoms
- No problems up & down stairs
- Some joint aches
- No medication
Mr S

Examination Normal – BP in clinic 153/92 usually 130/80

Resting ECG

- Sinus rhythm
- Small R waves V2 – V4
- Otherwise unremarkable
Risk of significant coronary artery disease?

1. Low
2. Intermediate
3. High
Risk – NZ Cardiovascular risk Calculator

- If BP systolic > 140 moderate risk – 10 - 15% (chance of cardiac event in next 5 years)
- If take usual BP low risk group 5-10%
- So risk low towards moderate

- But doesn’t adjust for family history
- So likely moderate or intermediate risk
Next test?

1. Reassurance
2. Aspirin and statin
3. Exercise stress test
4. Exercise/dobutamine stress stress echo
5. Nuclear perfusion scan
6. Calcium score
7. CT coronary angiogram
8. Coronary angiogram
ETT – 10 minutes Bruce protocol
Exercise testing remains widely used as the primary investigation in the workup of patients suspected of having CAD.

- Cheap & accessible
- Physiological and ECG parameters
- Objective assessment of exercise capacity
- Observation of symptoms
- Reassurance & confidence
- Prognostic information
- No radiation

- Sensitivity – 68%, Specificity - 77%
Mr S

- Atypical history
- Intermediate risk
- Normal ETT

- **Next test?**
  - Nil – aspirin & statin
  - CT angiogram
  - Stress echo
Comments on incremental benefits of additional tests over Exercise stress treadmill testing in patients such as ours

- Good exercise capacity has been associated with decreased mortality, MI and revascularisation even in those with ST depression (compared to those with decreased exercise capacity)
- Incremental value of stress perfusion imaging for patients with low-risk stress test or high pressure rate product without ST segment depression is small
- CTCA is useful in those with intermediate risk who have a borderline or uninterruptable ETT or can’t exercise
- But CTCA can be indicated in those with intermediate risk with atypical symptoms
What is important is to identify up front:
Why did patient go to GP? Why did GP refer?
Why are we seeing this person?

- General wellness check & screening
- Rule out coronary disease with atypical symptoms
- Typical cardiac symptoms – low risk profile
- Typical cardiac symptoms - high risk profile
- Chest pain - known cardiac history

As this will help determine the appropriate assessment pathway
General wellness check & screening

- Risk factor assessment
- Bloods – including lipid profile
- Exercise treadmill test
- Calcium score
- If high calcium score - stress echo
- If positive - angiography
Rule out coronary disease - atypical symptoms

- Careful history and examination
- Risk factor assessment
- Exercise treadmill test
- Consider CT coronary angiography if intermediate risk
Typical cardiac symptoms – high risk

- Careful history and examination
- Risk factor assessment
- ECG
- Exercise treadmill test
- Coronary angiography
Typical cardiac symptoms – low risk

- Careful history and examination
- Risk factor assessment
- Exercise treadmill test
- Stress echocardiography
- CT coronary angiography (if uninterpretable ECG or unable to exercise)
Chest pain - known cardiac history

- Careful history and examination
- ECG
- Exercise treadmill test
- Stress echocardiography - if lesions of uncertain significance
- Coronary angiography
Stress echo - benefits

- Localising site of ischaemia
- Identifying multi-vessel & left main coronary disease
- Identifying whether an intermediate lesion is haemodynamically significant
- Prognostic information
- Sensitivity – 80%, specificity - 86%
Exercise treadmill testing remains an important and useful test in the assessment of patients with chest pain.

It is important to identify from the history the reason for referral as it will determine the appropriate investigative pathway.
CHEST PAIN (2)
A Friday night to remember......

Dr COLIN EDWARDS
Cardiologist
Waitemata Health

JULY 2010
30 year old ♀
32 weeks pregnant (P1G2)- previous pregnancy 2 yrs ago-uneventful. Presents to A+E complaining of sudden onset severe chest and back pain.

Shopping-lifted a heavy parcel into her car → sudden severe interscapular back pain → radiated to the front of her chest → pain down her right arm.

CV RISK → low YOUNG FEMALE Smoker
No hypertension, No diabetes, T cholesterol 5.1, HDL-1.4mmol/l, LDL-3.4mmol/l No family hx of early CAD
Grandmother died young during pregnancy - ? cause

A+E EXAMINATION
Right arm BP-difficult to hear, L arm BP- 150/90mmHg Splinter haemorrhages of her right fingers Murmur ?new

ADMITTED TO HOSPITAL
Diagnosis – Pregnant new murmur splinter haemorrhages ?Infective Endocarditis
HOSPITAL ADMISSION

Busy winter Friday night-7pm

Triaged onto a stretcher in the corridor
diagnosis- ?sbe,
good BP → routine urgency
EXAMINATION- In Corridor (10pm)

Extremely distressed and sobbing
Strikingly tall
Afebrile
PR-100bpm, BP-160/90mmHg-left arm; Right arm BP- ?
Right hand- relatively cold and underperfused, vasculitic lesions of the fingers
Carotid pulses both present
CVS- ?soft diastolic murmur
CHEST- good breath sounds, no tracheal shift
ABDOMEN- soft
Pedal pulses-present
ECG
DIAGNOSIS:
• INFECTIVE ENDOCARDITIS
• ACS
• PE
• PNEUMOTHORAX
• AORTIC DISSECTION

SALIENT FEATURES ON CLINICAL ASSESSMENT

Sudden onset- of back and chest pain
Reduced right arm pulses and BP
Grandmother died 3\textsuperscript{rd} trimester pregnancy
Very tall

AORTIC DISSECTION
? Marfans Syndrome
INVESTIGATIONS

CXR – not done due to pregnancy

Echo- good for aortic sinuses.
    transverse arch and descending aorta-not clearly seen

TOE- quite invasive-?extend dissection

Contrast CT- test of choice
    not in Pregnancy

CARDIAC MRI-no radiation, no contrast required
Delivered the baby by Caesarean Section

Mother-Bentals procedure
MARFANS SYNDROME

Pectus excavatum

Fig. 1

Person with Marfan syndrome is tall and thin and has arm span that exceeds his height.
<table>
<thead>
<tr>
<th>CARdiovascular</th>
<th>MAJOR CRITERIA</th>
<th>MINOR CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Dilat. Ascending ao (sinuses)</td>
<td>1. Mitral prolapse and MR</td>
</tr>
<tr>
<td></td>
<td>2. Aortic dissection</td>
<td>2. Mitral annular calcification (&lt;40yrs)</td>
</tr>
<tr>
<td></td>
<td>3. AA dissection &lt;50yrs</td>
<td>3. AA dissection &lt;50yrs</td>
</tr>
<tr>
<td></td>
<td>4. PA dilatation</td>
<td>4. PA dilatation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MUSCULOSKELETAL</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Arm Span &gt; Height</td>
<td>1. Mild pectus abnormalities</td>
<td></td>
</tr>
<tr>
<td>2. Upper body &lt; lower body (0.85 v 0.93)</td>
<td>2. High arched palate with crowding of teeth</td>
<td></td>
</tr>
<tr>
<td>3. Arachnodactaly (arm wrist sign)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Severe pectus abnormalities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Significant scoliosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Pes planus</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GENETIC/FAMILY</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Parent, child or sib with criteria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. FBN1 gene mutation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EYE</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ectopia lentis</td>
<td></td>
</tr>
</tbody>
</table>

**DIAGNOSIS:**
Major from 2 systems and major/minor from a 3rd system
Gene positive plus a major from 1 system and major/minor from a 2nd system
Marfans and Pregnancy

Pregnancy promotes aortic rupture.
- ↑aortic shear stress due to hyperdynamic circulation and ↑ blood volume,
- hormone changes of pregnancy (elastase etc.) → weaken aortic media

Risk of aortic rupture is unpredictable and can occur at any aortic dimension
If aortic sinus >40mm - risk is increased.
Risk of aortic rupture is ± 1% if aortic sinus diameter is < 40mm.
If aortic sinus >45mm - recommend aortic repair prior to conception.
Rupture usually occurs in the 2nd or 3rd trimester of pregnancy

Inheritance is autosomal dominance- 50% chance of transmission

If they do fall pregnant- referral to specialised centre-multidisciplnay approach, serial echos for aortic dimensions, β-blockers (metoprolol), C/S if aortic root >40mm
CLUES TO THE DIAGNOSIS:

Sudden onset of the chest pain

Pain of aortic dissection- ‘like a gunshot going off’
   Interscapular
   Absent pulses, discrepant BP’S

Grandmother dying in pregnancy

Angina- gradual onset, often with exertion, crescendo over 5 min
   relieved by rest, relieved by GTN

Abrupt onset with the greatest intensity of pain at the beginning
   → pneumothorax, aortic dissection or acute pulmonary embolism

Seldom loose pulses in infective endocarditis → microvascular infarcts
THANK YOU