CASE 2

Short case number: 3_2_2
Category: Cardiovascular
Discipline: Medicine
Setting: Emergency Department
Topic: Cardiomyopathy – Dilated, modifiable risk factors, coronary stenting and imaging [SDL]

Case

Michael Frank, aged 68 years, presents feeling fatigued and acutely breathless and unwell. He experienced an inferior myocardial infarction 5 years ago, and underwent insertion of a coronary stent. However, he then had a second inferio-lateral infarct 3 years ago and required further stenting. An echocardiogram following his most recent infarct suggested early features of dilated cardiomyopathy.

Questions

1. What further history and examination is required?
2. What initial investigations would you order?
3. What are the main causes of dilated cardiomyopathy?
4. Discuss the value of an echocardiogram in this setting compared to plain imaging or CT?
5. Discuss the value of a heart assessment, such as proposed by the National Heart Foundation in the routine population?
6. What risk factors should have been sought and treated in a male with ischaemic heart disease?
7. What is the current evidence base behind the role of coronary stenting?
8. When is open heart surgery indicated in the setting of ischaemic heart disease?

Suggested reading:

- Colledge NR, Walker BR, Ralston SH, Penman ID, editors. Davidson's Principles and Practice of Medicine. 22nd edition. Edinburgh: Churchill Livingstone; 2014. Chapter 18.

ANSWERS

1. **What further history and examination is required?**

   Acute onset of breathlessness may be:
   - cardiovascular,
   - respiratory,
   - metabolic.

   A detailed history of the onset of the problem is imperative. Given this man's history, consideration and exclusion of another myocardial infarction with acute heart failure is imperative. The other priorities are to exclude as soon as possible include acute pulmonary oedema and pulmonary embolus.
   A more detailed history will help refine the differential diagnosis list and the features that must be sought on history include the presence or absence of associated symptoms.
   These include:
   -pain or discomfort (type of pain location of pain, radiation of pain, previous experience with this pain?)
   - cough (productive, non-productive, or blood-stained)
   - sweating
   -light headed
   -fevers
   -nausea and vomiting
   -lower limb oedema
   -calf discomfort.
   Other features to consider in the initial history include recent travel, recent change in medications,
   The physical examination must start with general inspection of the patient and a rapid assessment of the degree of distress they are experiencing.
   This general inspection will allow an assessment of the degree of agitation, breathlessness including orthopnea, pallor (peripheral/central cyanosis) and prostration. An assessment of pulse and blood pressure must be made.
   The rest of the examination includes an assessment of the JVP, heart sounds, and auscultation of the chest and examination of lower limb or sacral oedema.

2. **What initial investigations would you order?**

   The initial investigations include:
   - blood tests (FBC, EUC, TFT, cardiac enzymes)
   - chest x-ray
   - ECG

3. **What are the main causes of dilated cardiomyopathy?**

   Inherited, Single gene mutation, Alcohol, Inherited muscular dystrophies, Autoimmune to viral myocarditis.
   Note: ischaemic cardiomyopathy must be excluded dilated cardiomyopathy can be diagnosed.

4. **Discuss the value of an echocardiogram in this setting compared to plain imaging or CT?**

   Echocardiography two-dimensional echocardiography allows a non-invasive, well tolerated method of examining both the structure and function of the heart.

Plain imaging only shows structure.

5. **Discuss the value of a heart assessment, such as proposed by the National Heart Foundation in the routine population?**

Two strategies are suggested to prevent heart disease in healthy, but at risk of disease populations.
Firstly, the risk factors of the whole population may be considered through public health messages on diet, smoking and exercise.
Secondly, target populations are identified and through this, high risk individuals are target for treatment strategies. The National Heart Foundation and the Cardiac Society of Australia and New Zealand have identified these groups as people with:
- pre-existing vascular disease
- diabetes
- renal disease
- Aboriginal and Torres Straight Islanders
-familial hypercholesterolemia
-a positive family history of heart disease
-metabolic disorder with central adiposity.
In this second group, correction of risk factors is considered paramount in order to prevent vascular events.

6. **What risk factors should have been sought and treated in a male with ischaemic heart disease?**

- Past history or current history of smoking,
- Knowledge of a family history,
- Hypercholesterolemia or hyperlipemia,
- Hypertension,
- Diabetes (type I or type II),
- Physical inactivity,
- Obesity,
- Other dietary factors including a diet that is low in fresh fruit, vegetables and polyunsaturated fatty acids,
- Alcohol intake,
- Past history of clotting disturbances.

7. **What is the current evidence base behind the role of coronary stenting?**
When is open heart surgery indicated in the setting of ischaemic heart disease?

STENT Coronary stents allows complete dilation of the artery and reduce the risk in the short term and longer term for re-occlusion of the artery which may occur if an angioplasty alone is performed. This is especially when stenting is combined with long term use of aspirin and/other platelet receptor inhibitors.

CABG Coronary artery bypass grafting should be considered when there is disease:
- of the left main artery
- more than three-vessel coronary artery disease involving left anterior descending artery, circumflex, right coronary artery
- more than two vessel disease involving the proximal left anterior descending artery.