PERICARDITIS

CNS/NP Teaching September 8th 2020

Dr Mark Ballinger FACEM

CASE

A 23 year old presents with chest pain

WHAT DO YOU WANT TO KNOW?

- Pain – site, onset, character, radiation, associations, time, exacerbating/relieving factors, severity (SOCRATES). Also, any similar in the past?
- Review of systems, recent illnesses etc
- Past medical history
- Family history
- Medications and allergies
- Social history: occupation, smoker, alcohol, drugs

CASE HISTORY

- Pain reported as both sharp and dull, central, worse on breathing and improves on sitting up, started 2 days ago, getting worse, feeling a little SOB.
- Normally well but just getting over a flu-like illness that he had last week (fevers, aches, coryza)
- Father: hypertension
- No regular meds, just paracetamol during the illness. No allergies.
- Work as apprentice builder, smoker, cannabis, social alcohol

DIFFERENTIALS SO FAR?

MORE LIKELY

- LRTI
- Pneumothorax
- Pericarditis
- GORD
- Musculoskeletal

LESS LIKELY

- PE
- Acute MI
- Dissection
- Malignancy

How would the likelihood of these change in a 60 year old man?

EXAMINATION

- Vital signs? Fever?
- Sick or well looking?
- Resp – RR, sats? SOB, WOB, tachypnoeic? Breath sounds? Wheeze? Crackles? Dull?
- CVS – pulses and BP? Perfusion? Heart sounds? Added sounds? Murmurs?
- GI – abdo pain, epigastric/RUQ? Peritonism?

- This patient:
  - Looks well. HR 88, BP 130/70, RR 19, Sats 97%, T 37.4
  - HS dual, no obvious added sounds
  - No WOB, chest clear, equal AE, slightly SOB perhaps
  - Abdo SNT

WHAT DO YOU DO NEXT?

- Bloods
  - FBC (infection, anaemia)
  - Electrolytes and renal function
  - CRP (infection, inflammation)
  - Troponin (ACS, peri/myocarditis)
- CXR (PTX, heart size/shape, consolidation, fluid, malignancy, free air)
- ECG

HIS ECG

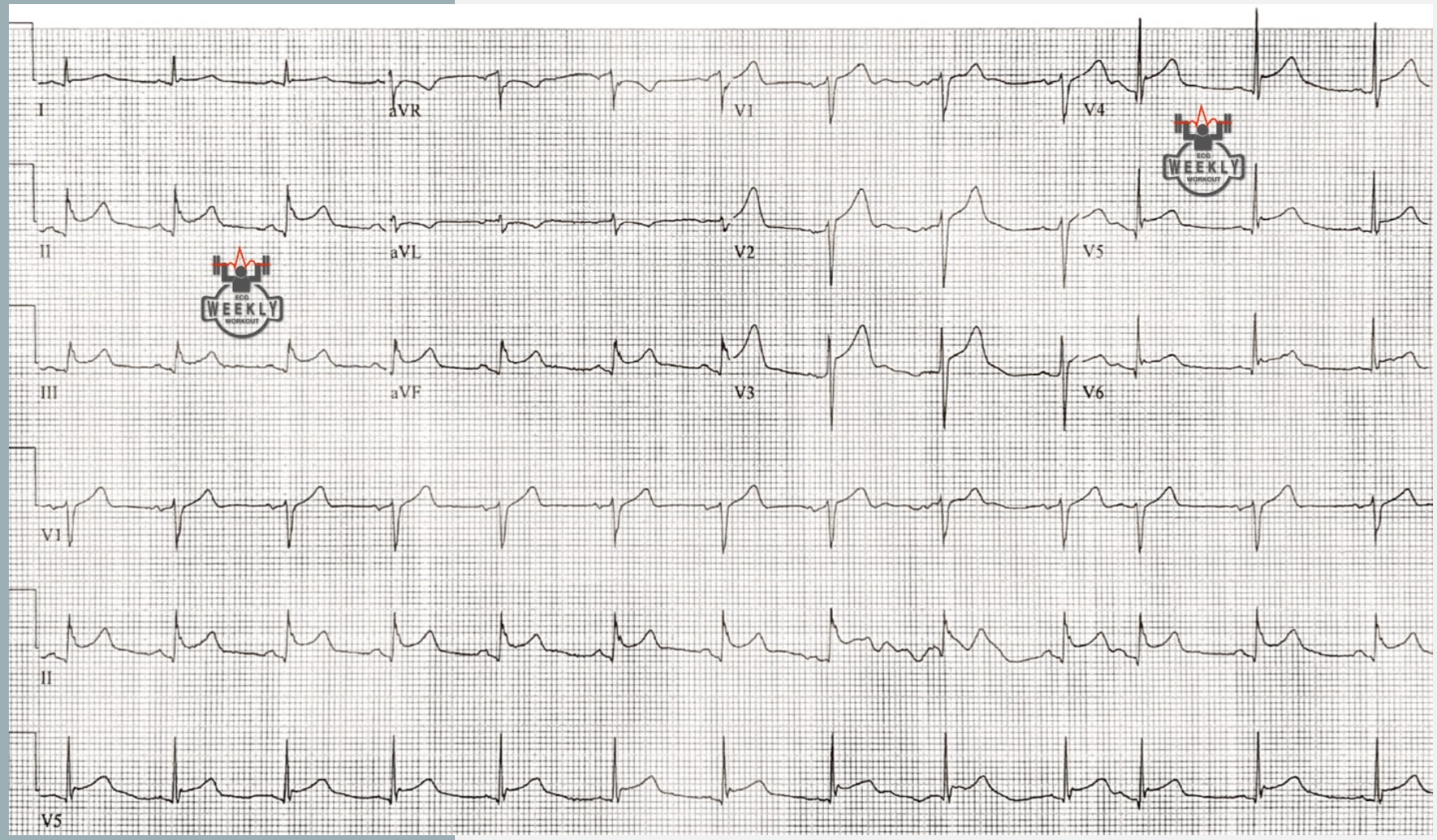
Rate?

Rhythm?

Axis?

Intervals?
- PR
- QRS
- QT

Ischaemia?
- STE
- STD
- TWI
- Reciprocal changes



HIS ECG

- Rate: ~80 bpm
- Rhythm: normal sinus (one QRS for every P)
- Axis: normal (leads I and aVF both positive)
- Intervals: PR, QRS, QT all normal
  - but PR appears depressed in several leads, and T-P segment seems to slope downwards
- Ischaemia??
  - Widespread ST elevation throughout the ECG
  - Shape of the ST elevation is more concave (saddle shaped)
  - No reciprocal changes, no T wave inversion

BLOODS AND X-RAY COME BACK

- FBC – Hb 161, WCC 13.4, Plt 536
- Electrolytes normal
- CRP 47
- Troponin 23
- CXR – clear

DIAGNOSIS?

Viral pericarditis!!

DECISIONS

- Treatment?
- Admit or discharge?
- Follow up?

- This patient:
  - d/w medics (raised trop), likely able to go home
  - NSAIDs (**not** aspirin) and colchicine 500mcg BD
  - If admitted, may get an echo
  - Return advice if discharged

PERICARDITIS

CAUSES

- Viral ~80% of cases seen in ED
  - Influenza
  - COVID-19
  - Coxsackie, echo- and adenoviruses
  - Parvo, EBV, Mumps, Varicella
  - Hep A and B
  - HIV (common)
- Bacterial – staph, strep, pneumococcus, salmonella, legionella
- Autoimmune – RA, SLE, GCA, sarcoid
- Post MI or cardiac surgery (Dressler's)
- Myocarditis – rheumatic fever, viral
- Malignancy ~10% of cancer patients
  - Lung > breast > leuk/lymph > melanoma
- TB
- Radiation
- Severe uraemia

PRESENTATION

HISTORY

- Chest pain
  - Central, sharp, dull, burning, pressing, radiates to left trapezius and scapula
  - Worse on inspiration, lying flat and movement. Relieved by sitting forwards
  - Pleuritic component
  - Absent in 50% (usually chronic/malignant)
- SOB
- Fever

EXAMINATION

- Pericardial rub (50%)
  - High pitched, scratchy or squeaking
  - Incr on sitting forward and inspiration
- Tachypnoea
- Tachycardia
- Fever
- Signs of pericardial effusion
- Features of the underlying disease

INVESTIGATIONS

ECG PHASES

1. Diffuse concave ST elevation with PR depression (first 2 weeks)
2. Resolution of stage 1 with T-wave flattening (1-3 weeks)
3. Deep symmetrical T-wave inversion (3 to several weeks)
4. Resolution (several weeks +)

- ECG can be normal. <50% go through all these four classic stages,

OTHERS

- Bloods
  - FBC – raised WCC
  - U&E – urea not routine at WDHB
  - CRP raised in ~80% of cases
  - Cardiac enzymes (30% elevated)
  - Coags if haemorrhagic suspected/anti-coags
- CXR – other pathology, heart size, tamponade
- Echo (bedside and formal)

DIAGNOSIS

REQUIRES AT LEAST TWO OF:

- Chest pain
- Pericardial rub
- ECG changes
- New or worsening pericardial effusion

DIFFERENTIALS

- Pericarditis / myocarditis
- STEMI
- Dissection
- Pulmonary embolism
- GORD
- Musculoskeletal
- Pneumonia / pleural effusion
- Pneumothorax

MANAGEMENT

- Analgesia
- NSAIDs *(avoid aspirin due to possibility of haemorrhagic pericarditis)*
- Colchicine *(in patients with mostly viral pericarditis)*
  - 500mcg BD (once daily if <70kg)
  - Reduces pain at 72 hours by 50%
  - Reduces persistent symptoms by 20%
  - Reduces recurrent pericarditis by 10%
- Sit upright
- Cardiac monitoring if elevated troponin

- Specific
  - Bacterial
    - Broad spectrum antibiotics
    - Pericardiocentesis
    - Admit to HDU/ICU
  - Uraemic – dialysis
  - Autoimmune – immunosuppressants
  - Dressler's – steroids
  - **Anticoagulants / thrombolysis are contraindicated**

ADMISSION CRITERIA

- Pericardial effusion or tamponade
- Significant myocarditis (significantly raised troponin)
- Bacterial pericarditis
- Immunosuppression
- Over anticoagulation
- Uncontrolled pain

DISPOSITION

FOLLOW UP

- Timing depends on underlying cause
- Usually at least 6 weeks

PROGNOSIS

- 20-30% recurrence
- 50% of those with recurrence will have a further episode
- 20-30% fatality rate from bacterial pericarditis

STEMI VS. PERICARDITIS

STEMI

- Older with ACS risk factors
- Dull pain, shorter duration
- Anatomically convex elevation
- ST elevation III > II
- No PR depression
- Reciprocal ST depression
- Rapidly dynamic ECG changes (mins)

PERICARDITIS

- Younger age group
- Longer duration, pleuritic, postural
- Non-anatomic concave elevation
- ST elevation II > III
- PR depression common
- No reciprocal ST depression
- ECG changes evolve slowly (days)

KEY ECG QUESTIONS

- Look first for factors that rule in STEMI:
  - ST depression
  - ST elevation III > II
  - Horizontal or convex upward STE

Any of these = STEMI

- If none of the above, then, and only then, you can look for:
  - PR depression
  - Spodick sign (T-P downsloping)

ECG WEEKLY

- If you want to learn more about ECG interpretation visit:

https://ecgweekly.com

- 10-25 minute video podcast released every Sunday night
- Full access to entire 10 year archive, search by topic etc
- US$26 (~NZ$35) per year – there are $1 per week and $3 per week options
- There's a sample case to try out, also Google 'ECG Weekly' and there might be others too

REFERENCES

Life in the Fast Lane

- https://litfl.com/pericarditis/

Emergency Medicine Manual (Dunn) –

- https://emergencymedicinemanual.com/Content/v6/TEMM%206%20single%20volume-Responsive%20HTML5/index.html#t=TEMM_6_single_volume%2FCardiovascular%2FChest_pain%2FPericarditis.htm

Acute Pericarditis vs STEMI, ECG Weekly, Nov 18th, 2019

- https://ecgweekly.com/2019/11/amal-mattus-ecg-case-of-the-week-november-18-2019/