Case of the Week-
ECG Interpretation Skills for Medical Students

Curriculum Retreat

September 25, 2010

Gabriel Yip, M.D.

Associate Professor, Division of Cardiology

Department of Medicine & Therapeutics

The Chinese University of Hong Kong

Prince of Wales Hospital,

Hong Kong

Web-based Learning in Cardiology

http://facs.med.cuhk.edu.hk/site/2010/ecgcardi/Theme_ECG.asp

3 Projects ongoing:-

- **ECG Weekly** (*2-year cycle/ 42 ECG in 1 yr*)
- **Case of the Month** (*Scenario-based MCQ*)
- **Cardiac Murmurs** (in process)

Web-based Learning in Cardiology

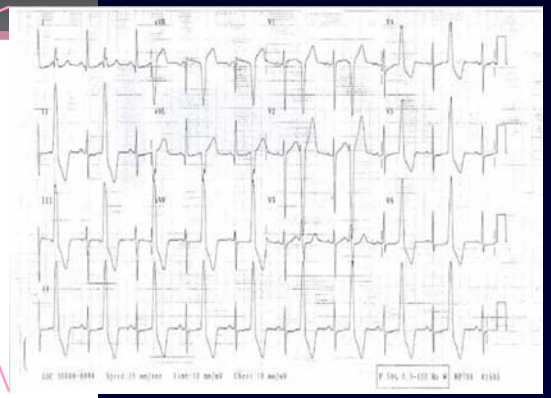
http://facs.med.cuhk.edu.hk/site/2010/ecgcardi/Theme_ECG.asp

- **ECG Weekly** (*2-year cycle/ 42 ECG in 1 yr*)
  - Simple one-sentence background Hx
  - Online Proforma for answering (see website)
    - Train students sequence of interpreting ECG
    - *Ultimately ECG is a pattern recognition*
  - Explanations of answers

CARDIOLOGY ECG

Weekly Case #7 [login by ECG_Student]

74 Y.O.MAN WITH HISTORY OF HT, COMPLAINED PALPITATIONS.



What's the Dx?
(Please select no more than 6 options.)

Normal
- ☐Normal ECG

Axis
- ☐Normal
- ☐Right axis deviation (RAD)
- ☐Left axis deviation (LAD)
- ☐Undetermined

Intraventricular Conduction Abnormalities
- Right bundle branch block (RBBB) ☐Complete ☐Inomplete
- Left bundle branch block (LBBB) ☐Complete ☐Inomplete
- ☐Left anterior fascicular block (LAFB)
- ☐Left posterior fascicular block (LPFB)
- ☐Bifascicular block (RBBB+LAFB)
- ☐Non-specific intraventricular block
- ☐Low ECG Voltage

ST and T Abnormalities
- ☐Non-specific ST abnormality
- ☐Pericarditis

Chamber Enlargements
- Left ventricular hypertrophy (LVH) ☐With ☐W/o strain pattern
- Right ventricular hypertrophy (RVH) ☐With ☐W/o strain pattern
- ☐Left atrial enlargement (LAE)
- ☐Right atrial enlargement (RAE)

Ischemia and Infarction
- ☐Ischemia with ST and T abnormalities (in stable angina and NSTEMI)

Anterior ST-elevation MI
- Anterior MI ☐Acute ☐Old
- Anteroseptal MI ☐Acute ☐Old

Inferior ST-elevation MI
- Inferior MI ☐Acute ☐Old
- Acute inferior-posterior MI ☐With ☐W/o RV involvement

Arrhythmias
- ☐Sinus bradycardia
- ☐Sinus tachycardia
- ☐Premature Atrial Contraction (PAC)
- ☐Premature Ventricular Contraction (PVC)
- ☐Atrial Fibrillation
- ☐Atrial Fibrillation (slow ventricular response)
- ☐Atrial Flutter with 2:1 block
- ☐Atrial Flutter with variable AV block
- ☐Multifocal atrial tachycardia
- ☐AV Block 1st degree
- ☐AV Block 2nd degree (2:1)
- ☐AV Block 2nd degree (Mobitz I)
- ☐AV Block 2nd degree (Mobitz II)
- ☐Complete Heart Block (CHB)
- ☐Supraventricular tachycardia
  - ☐Wolff-Parkinson-White (WPW) (Pre-excitation syndrome)
- ☐Ventricular tachycardia (VT)
- ☐Ventricular fibrillation (VF)

Digitalis
- ☐Digitalis effect

Electrolyte Abnormalities
- ☐Hypokalemia
- ☐Hyperkalemia

Submit

ECG Weeks 2010 - Mozilla Firefox

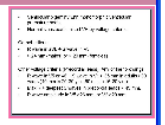
File Edit View History Bookmarks Tools Help

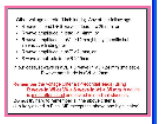
http://facs.med.cuhk.edu.hk/site/2010/ecgcardi/

ECG Weekly Case 2010 | ECG Weeks 2010

CARDIOLOGY ECG

Weekly Case #7 [login by ECG_Student]





CASE ANSWER

Axis Normal
Left ventricular hypertrophy (LVH) with strain pattern
Premature Ventricular Contraction (PVC)

Your feedback for this question is

Submit

Done

ecg_facs_ans6_1_76893420.JPG (JPEG Image, 6...

File Edit View History Bookmarks Tools Help

http://

ecg_facs_ans6_1_76893420.JPG (JPEG...

- Ventricular bigeminy with monomorphic ventricular premature beats
- Normal sinus beats: also LVH by voltage criteria:

Cornell criteria:
- R wave in aVL + S wave in V3
- > 24 mm (males) or > 20 mm (females)

Other voltage criteria (Precordial leads). Any of the followings:
- R wave in V5 or V6 + S wave in V1 > 35 mm in adults >30 years (40 mm in 20-30 y.o.; 60 mm in 16-20 y.o.)
- Max R + deepest S waves in precordial leads > 45 mm,
- R wave amplitude in V5 >26 mm, or V6 >20 mm

Other voltage criteria (Limb leads). Any of the followings:
- R wave in lead I + S wave in lead II ≥ 26 mm, or
- R wave amplitude in lead I ≥14mm, or
- R wave amplitude in aVL ≥12mm (highly specific but insensitive finding), or
- R wave amplitude in aVF ≥21mm, or
- S wave amplitude in aVR ≥15mm

In our case, R wave in aVL + S wave in V3 >24 mm (males) & R wave amplitude in aVL ≥12mm.

Remember the voltage criteria (Precordial leads) using **R wave in V5 or V6 + S wave in V1 > 35 mm** in adults is most often used and asked in medical students.
Do not try hard to remember all the above criteria
(Unlikely asked in Final MB except the above one highlighted)

Web-based Learning in Cardiology

http://facs.med.cuhk.edu.hk/site/2010/ecgcardi/Theme_ECG.asp

To be done this year….

- **10-15 essential ECGs mini-test before Final MB**

- **Collect separate ECG scores from Final MB to assess any outcome improvement**

Case of the Month (*Scenario-based MCQ*)

http://facs.med.cuhk.edu.hk/site/2010/ecgcardi/Theme_ECG.asp

- Prior reading of supplementary notes for important Cardiology topics before MCQs

Aims:-

- To bridge gaps not covered in formal lectures
- To reinforce knowledge already learnt
- Possibly stimulate self-thinking & discussion in later small group tutorials

- Each MCQ followed by Explanations

CARDIOLOGY ECG

Case of the Month - August [login by ECG_Student]

PLEASE READ THIS BEFORE START

There are 5 cases in this section.
You MUST first download and read two PDF documents on the right.

Document 1: ACC-AHA 2009 CHF Guideline Summary

Document 2: Top Ten Points_The 2009 focused update to ACC-AHA CHF Guidelines

Document 1.pdf
Document 2.pdf


Document 1 - Shortcut.lnk


Document 2 - Shortcut.lnk

Then, you can proceed this 1.5 HOURS test.

We only count the first attempted answer to every question in each case.

If you think you are ready, click the Continue button and begin.

Continue

Address: **Room 103E, Staff Quarter A, Prince of Wales Hospital, Shatin, Hong Kong**
Tel.: **(852) 2632-1280**

Cardiac Murmurs (in process)

http://www.thinklabsmedical.com/stethoscope-app.html

Two parts of the project

- Heart Sound Library (thinklabsmedical)
- Self Record, Play and Share by students

Sounds captured by iPod/Phone, PC, Mac

Goal: Student self-built learning platform

Web-link to reference library site

Free phonocardiography software for PC/Mac
Record/Play, Display, Annotate, Edit, Analyze

Further extension to Lung or other sounds?

Web-based Learning in Cardiology

http://facs.med.cuhk.edu.hk/site/2010/ecgcardi/Theme_ECG.asp

Thank you

Further Comments Most Welcome

Web-based Learning in Cardiology

http://facs.med.cuhk.edu.hk/site/2010/ecgcardi/Theme_ECG.asp

- **ECG Weekly** (*2-year cycle/ 42 ECG in 1 yr*)
  - Simple one-sentence background Hx
  - Online Proforma for answering (see website)
    - Train sequence of interpreting ECG
    - Ultimately ECG is a pattern recognition exercise
  - Explanations of answers

- **Case of the Month** (*Scenario-based MCQ*)
  - Prior reading of supplementary notes for important Cardiology topics before MCQs
  - Aims to bridge gaps not covered in didactic lectures

- **Cardiac Murmurs** (in process)

Web-based Learning in Cardiology

http://facs.med.cuhk.edu.hk/site/2010/ecgcardi/Theme_ECG.asp

- **ECG Weekly** (*2-year cycle/ 42 ECG in 1 yr*)
  - Simple one-sentence background Hx
  - Online Proforma for answering (see website)
    - Train students sequence of interpreting ECG
    - *Ultimately ECG is a pattern recognition*
  - Explanations of answers

To be done this year….

- 10-15 essential ECGs mini-test before Final MB
- Collect separate ECG scores from Final MB to assess any outcome improvement