

## Student's Corner

### Become a Sherlock Holmes in ECG

M Chenniappan<sup>1</sup>

#### Series 5 :

#### “Don't Let Depressions to Depress You”

This is the ECG of 40 years patient who presents with chest pain and dyspnea. This is the first ECG taken for him and it is a routine ECG.

#### Questions :

- (1) What are the ECG findings?
- (2) What are the causes of these ECG findings?
- (3) Why is this clue?

#### Answers :

(1) The striking feature in this ECG is PR depression especially in leads V4, V5, V6 with no significant ST elevation and PR changes in other leads especially limb leads

(2) There are 3 differential diagnosis for PR depression.

1. Normal Variant 2. Atrial Infarction 3. Acute pericarditis

Normal variant of PR depression is less than 1mm. In this ECG it is 1 mm and above, which makes normal variant unlikely.

Atrial infarction almost always is accompanied by Acute Inferior Wall Infarction or lateral infarction. If PR depression happens in chest leads it should be more than 1.5mm (LIU's criteria). In this ECG, there is no acute inferior or lateral infarction and PR depression is not more than 1.5mm in chest leads.

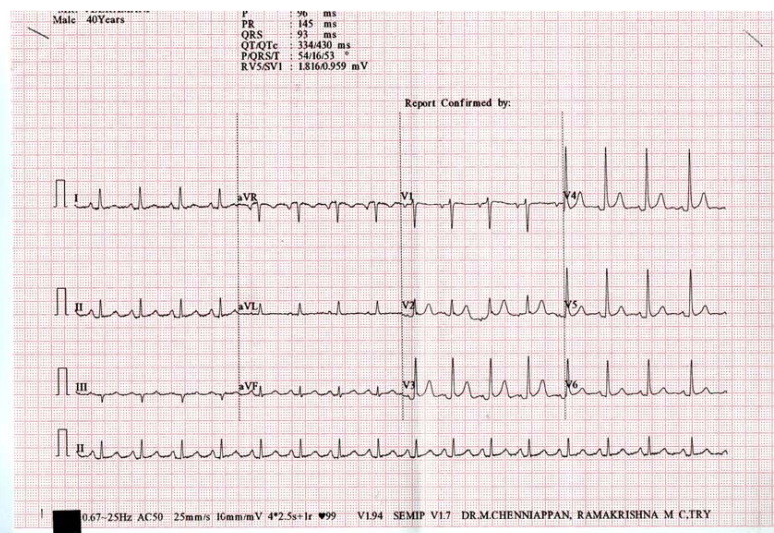
In acute pericarditis, PR depression is usually accompanied by concave ST elevation in all leads except in lead avR and possibly V1 and at this stage most often clinical evidence of pericarditis in the form of pericardial rub is present. This patient had no pericardial rub and the chest pain is not suggestive of acute pericarditis.

Then what is the cause of PR depression in the absence of normal variant, atrial infarction and acute pericarditis?

There are 4 stages of ECG signs in pericarditis

Stage 1: Classical ST elevation concavity upwards in all leads except lead avR which shows reciprocal depression with PR depression and Spodick's sign of down sloping TP segment

<sup>1</sup>Adjunct Professor, Dr MGR Medical University, Tamilnadu; Senior consultant cardiologist, Tamilnadu; Ramakrishna Medical Centre, Apollo Speciality Hospital, Trichy



Stage 2: In stage 2 ST elevation settle down with normal T wave. In early stage 2, ST may settle down, but PR depression may take more time to normalize. So early stages of stage 2, there may be only PR depression. But our patient had no previous history suggestive of pericarditis, and the chest pain he had is typically non cardiac.

Stage 3: the T wave gets inverted with normal ST and PR

Stage 4: there is normalization of ST and T waves

The second and most probable possibility of PR depression in this ECG is asymptomatic pericardial effusion. PR depression finding alone has been noted in asymptomatic pericardial effusion with no clinical signs of pericarditis (JACC 2002). Our patient had mild but significant pericardial effusion which is the probable cause of PR depression.

(3) This rare sign of pericardial effusion (PR depression) has taken away our concentration from the most important but subtle sign of LA abnormality in V1 in form of deep negative force of P wave. This may be the only sign in some of the patients in mitral stenosis or LV dysfunction which is due to left atrial hypertension in the absence of classical wide and bifid p wave in L II. This patient had moderate to severe Mitral Stenosis of VA of 1.2cm<sup>2</sup>. He may need an intervention for this finding rather than PR depression.

Sometimes, rare signs of ECG may take our attention away from a subtle but the most important sign in the ECG which is more crucial in the management of the patient. This ECG is typical example of this phenomenon. So don't get depressed because you may have missed LA abnormality due to your concentration on rare sign of PR depression. There is always other time!