ARCHIVES OF HELLENIC MEDICINE: ISSN 11-05-3992

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ARCHIVES OF HELLENIC MEDICINE 2017, 34(5):717–718
ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2017, 34(5):717–718

Electrocardiogram Quiz – Case 37

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A 67-year-old male, known case of coronary artery disease, non-compliant diabetic and hypertensive since 15–20 years presented in the Emergency Room (ER) of Government Medical College and Guru Nanak Dev Hospital in apprehensive state with complains of left sided chest pain and profuse sweating since 3–4 hours. He was in a state of shock with BP 60 systolic and unrecordable diastolic, very feeble pulse with rate of 68/min and raised jugular venous pulse (JVP). Apart from obesity, his other general physical examination was unremarkable. Abdominal examination was normal, the chest was clear and there was no neurological deficit. His electrocardiogram (ECG) obtained at the time of examination revealed following pattern (fig. 1). He was given intravenous fluids and inotropic support but he died before primary percutaneous coronary intervention could have been performed.

Comment

The ECG shows ST elevation in leads II, III, aVF and V1; ST depression in leads I, aVL and V2. The ST elevation in lead III is greater than in lead II, and ST elevation in lead aVF greater than ST depression in lead V2. The lead V2 shows the most interesting findings of R taller than S and "down-up" pattern of ST depression (fig. 1). The diagnosis made from the strip is inferior wall myocardial infarction (MI) with infarction of the right ventricle along with posterior wall.

Inferior wall myocardial infarction (IWMI) is localised in leads II, III and aVF on ECG. Around 25% to 50% of cases of IWMI are associated with a right ventricular myocardial infarction (RVMI). The standard 12-lead ECG provides information on the left ventricle but provides very little information on the right side of the heart. Only leads V1 and V2 provide a partial view of the right ventricle free wall. The ECG findings suggestive of RVMI on the standard 12-lead ECG include ST elevation in leads II, III, and aVF with reciprocal ST depression in the lateral leads. Characteristically in RVMI, the ST elevation in lead III is greater than in lead II, and the ST elevation in lead aVF is greater than the ST depression in lead V2. Right-sided precordial leads aid in much better evaluation of suspected RVMI due to their greater sensitivity, specificity and positive predictive values. ST-segment elevation of ≥1.0 mm in lead V4R is diagnostic of RVMI.

Early transition in precordial leads results in the taller R-wave, which is often taller than the S-wave. This R/S ratio >1 in leads V1 or V2 could indicate a problem like posterior STEMI. When this ratio is accompanied by "down-up" ST-segment depression, it is

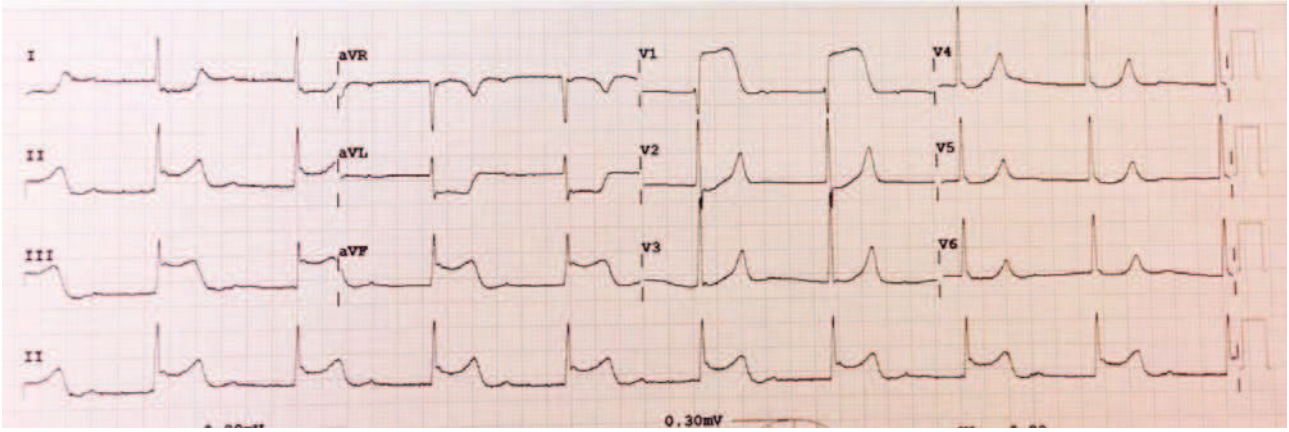

Figure 1

diagnostic of acute posterior STEMI. This peculiar type of ST-segment depression has been referred to as "Carousel pony". In most cases of posterior MI, the infarct extends to the lateral or the inferior wall of left ventricle. Such an overlap has happened in this particular case.

References

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Diagnosis: *Inferior wall myocardial infarction with infarction of the right ventricle along with posterior wall*