ARCHIVES OF HELLENIC MEDICINE: ISSN 11-05-3992

CONTINUING MEDICAL EDUCATION
ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

ARCHIVES OF HELLENIC MEDICINE 2018, 35(2):284–285
ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2018, 35(2):284–285

Electrocardiogram Quiz – Case 40

G.S. Shergill,
N.S. Neki,
A.S. Dhanju,
S. Aloona,
A. Vaid,
R. Bhardwaj

Department of Medicine, Government Medical College and Guru Nanak Dev Hospital, Amritsar, India

A 20-year-old male, known case of rheumatic heart disease since early childhood, presented in the medicine Emergency Room (ER) of Government Medical College and Guru Nanak Dev Hospital with complains of shortness of breath and fatigue since 3–4 hours. Cardiovascular examination revealed normal apical left ventricular (LV) impulse along with a prominent right ventricular impulse, an accentuated S1, and an opening snap followed by a diastolic rumble with presystolic accentuation heard best at the apex in the left lateral decubitus position. His electrocardiogram (ECG) in the ER showed the following pattern (fig. 1).

What is the most probable diagnosis?

Comment

This classical tracing shows left atrial abnormality in the form of "P mitrale" (suggested by large bifid P waves in leads II, III, aVF and V1) with right ventricular hypertrophy (suggested by dominant R wave in V1, secondary repolarization abnormality in the form of T wave inversion in the right sided precordial leads and right axis deviation) which strongly points towards mitral stenosis (MS). Diagnosis of severe MS was later confirmed by 2D echocardiography which revealed the mitral valve area of 1.1 cm^2.

Pathological changes in the ECG include first and foremost left atrial hypertrophy that may manifest as P mitrale, increased voltage in the later part of the P wave gives it a large, bifid appearance in leads II, III and aVF, while the second half of the P wave is negative in V1. Atrial fibrillation is present in 60 to 70%. Secondly, right

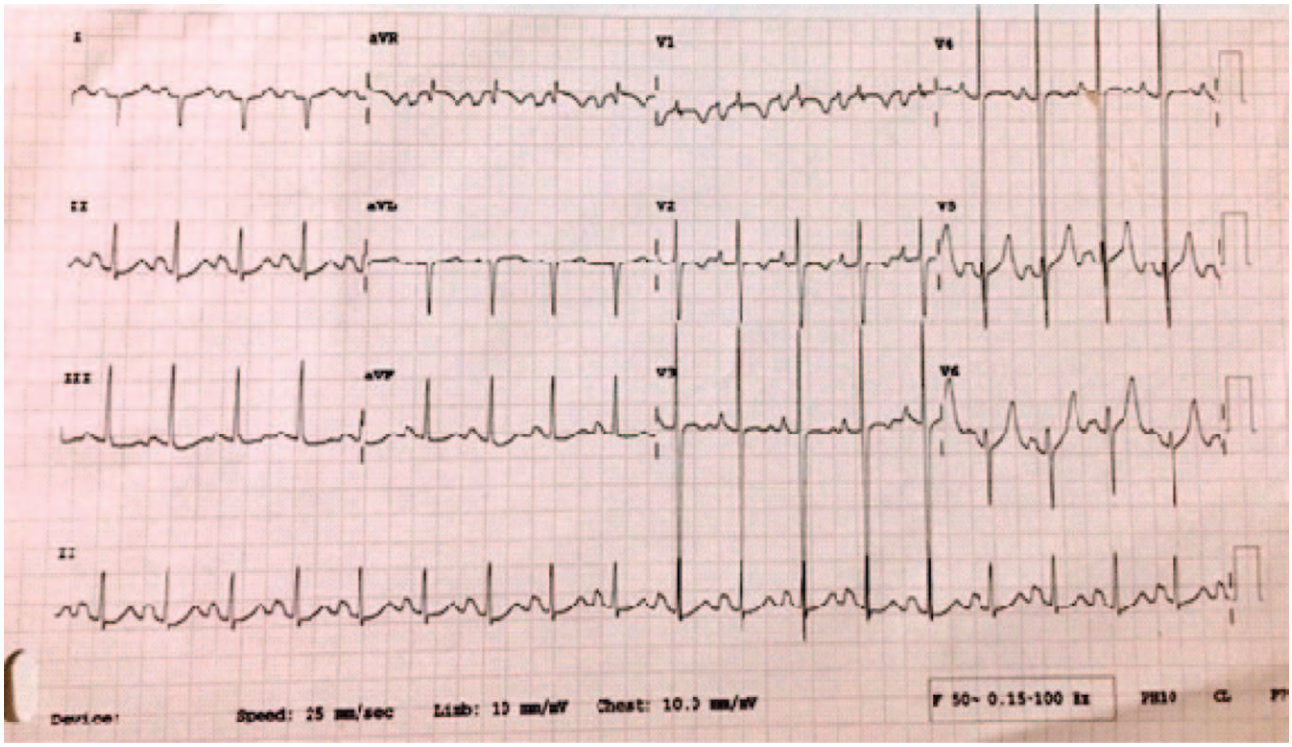

Figure 1

ventricular hypertrophy (RVH) that appears as a dominant R wave in V1 and V2 indicates pulmonary hypertension. Thirdly, there is associated right axis deviation and other non-voltage manifestations of RVH like secondary repolarization abnormalities, and finally, there may be features of digitalis effect in patients on digitalis regimen.

Twice as common in women as in men and mostly rheumatic in etiology, the pathology results due to fibrosis, calcification, leaflet thickening, and chordal fusion. Echocardiography is the primary imaging tool used to assess patients with MS. Normal mitral valve area is 4–6 cm^2. Narrowing below 2 cm^2 results in symptoms, whereas below 1 cm^2 narrowing is described as "critical".

References

1. NARASIMHAN V, FRANCIS J, SCHAMROTH C. *Leo Schamroth – An introduction to electrocardiography.* 8th ed. Wiley, India, 2014:142–143
2. GOLDBERGER AL, GOLDBERGER ZD, SHVILKIN A. *Goldberger's clinical electrocardiography: A simplified approach.* 8th ed. Elsevier, India, 2013:46, 222

Corresponding author:

G.S. Shergill, Government Medical College and Guru Nanak Dev Hospital, Amritsar, Pin 143001, Punjab, India
e-mail: drgagandeepshergill@gmail.com

Diagnosis: *Severe mitral stenosis*