

## CONTINUING MEDICAL EDUCATION ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

### Electrocardiogram Quiz – Case 2

A 73-year-old woman presented to the emergency department (ED) with a 4-day history of nausea and vomiting associated with anorexia. The patient had a history of diabetes mellitus, mechanical prosthetic aortic valve and mild renal failure. Routine 12-lead electrocardiogram (ECG) was performed (fig. 1) and a second ECG was carried out two hours later (fig. 2).

ARCHIVES OF HELLENIC MEDICINE 2008, 25(2):257  
ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2008, 25(2):257

**M. Daskalaki,**  
**G. Kelepesis,**  
**D. Papadopoulos,**  
**V. Votteas**

*Department of Cardiology, "Laiko"  
General Hospital, Athens, Greece*

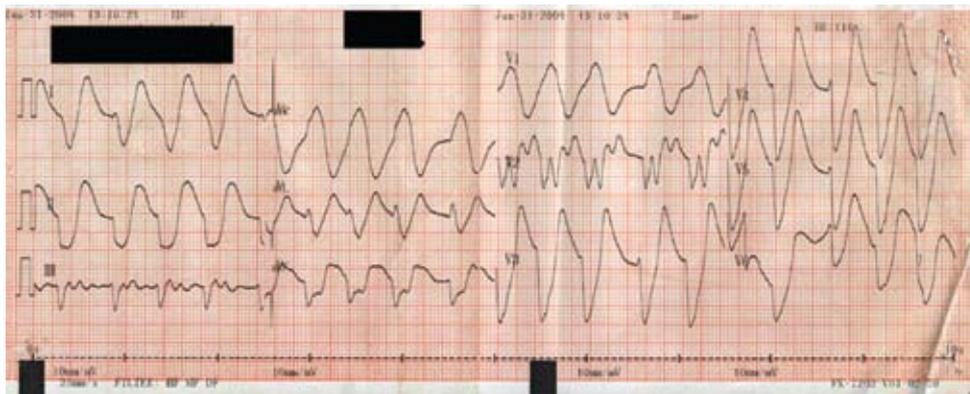


Figure 1

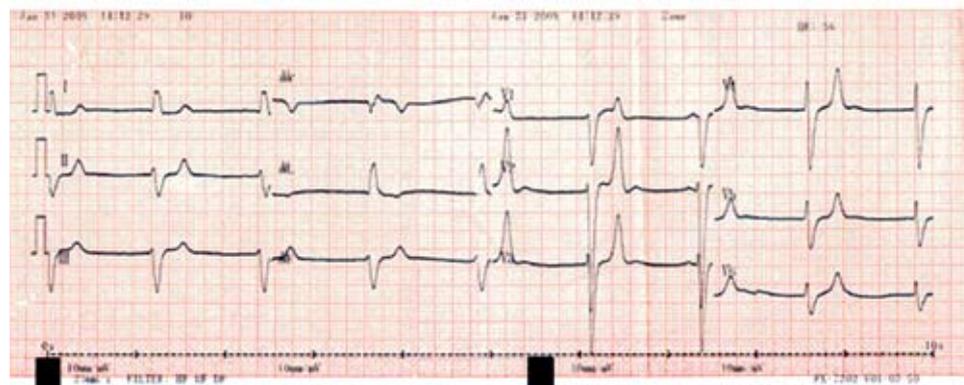


Figure 2

#### Comment

Patient had a mild renal failure which was diagnosed 7 days before and she was given warfarin, spironolactone, furosemide, atenolol and metformin. The ECG revealed tachycardia with wide QRS complexes and absence of P waves. Routine blood tests revealed a high potassium level of 10.2 mmol/L and moderate to severe renal failure.

Hyperkalemia is associated with distinctive sequence of ECG changes. The earliest effect is narrowing and peaking of T waves. At this stage, QT interval is shortened. Progressive extracellular hyperkalemia widen QRS and P wave amplitude decreases. PR interval prolongation can occur, followed sometimes by a second or third degree AV block. Complete loss of P waves is associated

with junctional escape rhythm. Moderate to severe hyperkalemia induces ST elevations in the right precordial leads and simulates an ischemic current-injury pattern. Even severe hyperkalemia may be associated with atypical or non-diagnostic ECG findings. Severe hyperkalemia is very dangerous as it may lead to eventual asystolia.

Corresponding author:

M. Daskalaki, Department of Cardiology, National and Kapodistrian University of Athens, School of Medicine, "Laiko" General Hospital, GR-115 27 Athens, Greece  
e-mail: mariadaskalaki@yahoo.gr

*Diagnosis: Hyperkalemia*