

## QUIZ

**EKG Quiz: “Confusion EKG!”**Yousef Darrat<sup>1</sup>, Khalid Abozguia<sup>2</sup>, Fathi Idris Ali<sup>3</sup><sup>1</sup>University of Kentucky, Lexington, KY, USA.<sup>2</sup>Lancashire Cardiac Centre, Blackpool Victoria Hospital, Blackpool, UK.<sup>3</sup>Department of Medicine-Cardiology, University Medical Center, Lebanon, TN, USA.

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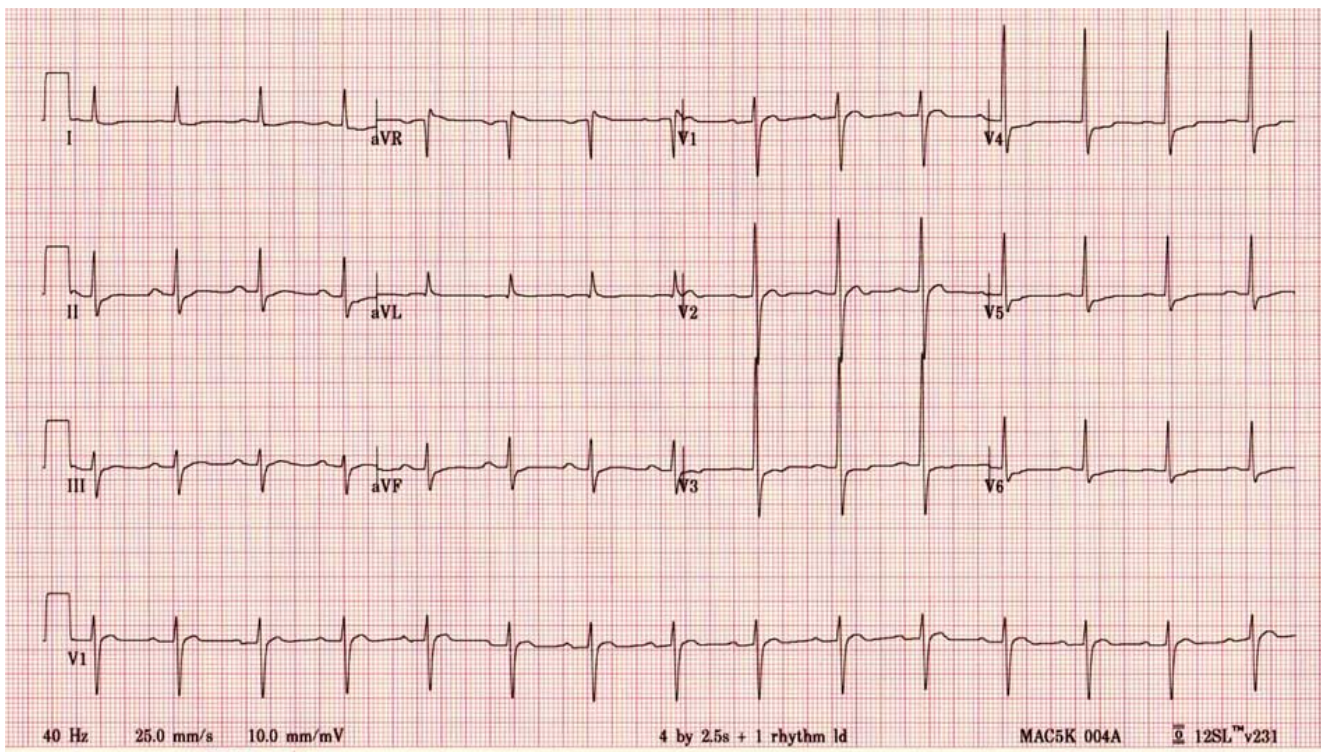
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**History**

A 78-year-old lady was admitted with deteriorating level of consciousness over a few days. The EKG below was performed upon admission. Please examine it and answer the questions before you proceed.

**Questions**

1. What is the major abnormality in this EKG? Any particular diagnosis suggested?
2. Would you worry if you see Digoxin on this patient's medication list?

**Answers**

1. The rhythm is sinus at about 90 bpm. The most prominent abnormality is the diffuse abnormal repolarization changes. This is primarily due to a very short QT interval. In some leads, there is no "ST segment", i.e. the T wave immediately follows the QRS complex (best seen in leads V1-V3). The calculated QT and QTc are 306 ms and 370 ms respectively. These EKG findings are very suggestive of hypercalcemia.

2. Yes. Hypercalcemia may enhance the effect of digoxin and hence can potentially predispose to digitalis toxicity (1-3).

**Discussion**

This lady was dry and was found to have Ca<sup>++</sup> of 3.9 mmol/L. Hypercalcemia is the likely cause of her deteriorating level of consciousness. The family gave a history of recurrent fractures, and she was admitted to the hospital for treatment and further work up to exclude malignancy. She was found to have metastatic breast cancer.

The pattern of absent "ST segment" is very characteristic of hypercalcemia. In the recent years, a familial short QT syndrome (SQTS) has been described, and was found to be associated with increased risk of sudden cardiac death. The typical EKG appearance of that syndrome is, however, different than the one shown in this case (1-3). The discussion of that syndrome is beyond the scope of this clinical vignette.

**The take-home message**

QT interval can be abnormally long or short. Although we usually look for an abnormally long QT interval, we should not forget about short QT interval.

**References**

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**Reviewers**

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