

ECG Quiz

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A 76-year-old shopkeeper presented to Emergency Department (ED) with a minor forehead laceration sustained at work. He was sitting at the cashier when he experienced a faint and landed on left side of his body. He denied any chest symptom before the event and regained full consciousness upon reaching the floor. He did experience on and off giddiness in the past few days. He was not taking any medication, either recently or in the long term. Family

history was negative of any significant medical illness.

He had a prior admission to another hospital one year ago for fever and cough, and was incidentally found to have bradycardia. He defaulted follow-up since then, as he was not symptomatic from it.

Figure 1 showed the ECG performed at ED. What was the cause of his syncope?

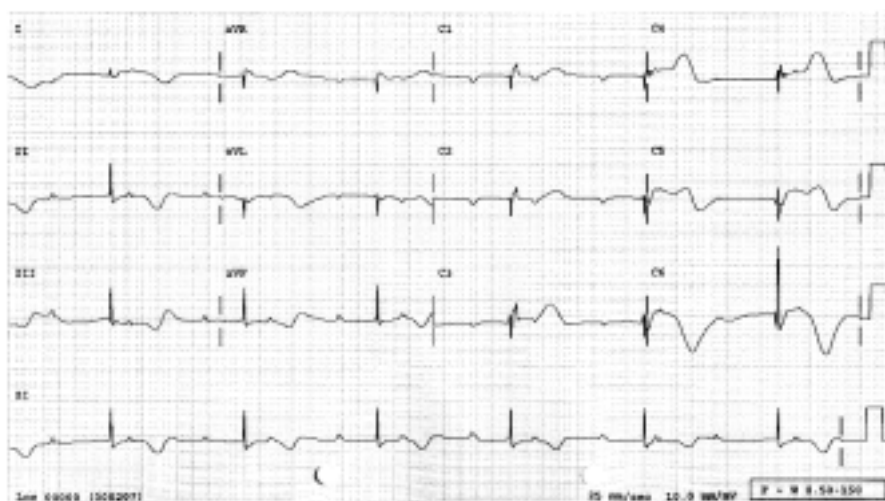


Figure 1.

Answer

The presenting ECG showed a sinus rate of 65/min and a ventricular rate of 38/min. There was complete atrio-ventricular dissociation. The QT interval was markedly prolonged, most prominent in lead V6. The corrected QTc interval was definitely excessive.

The presence of bradycardia and profoundly long QT raised the suspicion of Torsade de Pointes (TdP) as the underlying mechanism of syncope. TdP is a type of polymorphic ventricular tachycardia with continuous phasic alteration of the QRS morphology. It was first described by Desertenne in 1966.

Figure 2 was an ECG captured after the patient arrived at the ward. It illustrated the onset of polymorphic ventricular tachycardias initiated by a timed premature ventricular coupling (PVC) on the

terminal end of a QT after a long cycle. This "long-short" phenomenon together with the underlying bradycardia and QT prolongation are the three key points to TdP.

QT prolongation-TdP couple can be congenital or acquired. Common acquired causes include anti-arrhythmic agents, phenothiazines, tricyclic anti-depressants and various anti-microbial agents. Profound bradycardia and electrolyte disturbance such as hypokalemia and hypomagnesemia can also result in QT prolongation and precipitate TdP.

Management of this gentleman depends on the accurate diagnosis and correction of the underlying cause for the QT prolongation. Together with the correction of the reversible elements such as electrolyte disturbance, temporary overdrive pacing should be contemplated to prevent inappropriately firing PVC and thus achieving rate regularization.

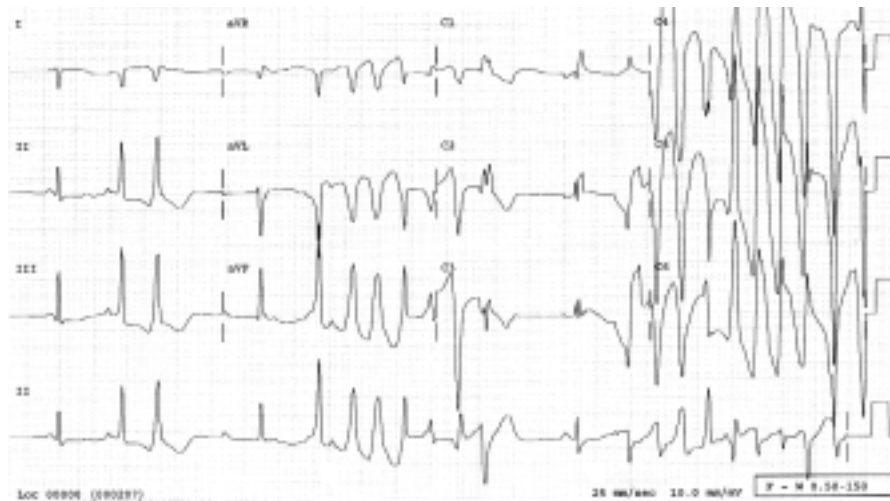


Figure 2.