DIAGNOSTIC CHALLENGE • DÉFI DIAGNOSTIQUE

Answer

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During her ED stay the patient experienced another brief episode of "light-headedness" with palpitations. A rhythm strip was obtained (see below, Fig. 1).

The QTc in Fig. 1 of the Question (pg 296) was measured at approximately 0.490 sec. A QTc > 440 ms is commonly used as the upper limit of normal. Fig. 1 below shows a brief episode of a ventricular arrhythmia, most likely torsade de pointes. The Answer is D, a ventricular arrhythmia secondary to prolonged QT syndrome.

The QT interval is measured on the ECG recording from the beginning of the Q wave to the end of the T wave. The QTc is the QT interval, corrected for heart rate (the faster the rate, the shorter the QT) and typically calculated by Bazett's formula ($QTc = QT \div \sqrt{RR}$ [in seconds]).

Electrocardiographic abnormalities in malnourished patients are well described in the literature. These ECG findings include a syndrome of electrocardiographic low voltage, repolarization abnormalities, QT interval prolongation and ventricular arrhythmias.[1] Of these, a long QT interval and ventricular arrhythmias have been proposed as the most likely cause of sudden death in these patients. No single, unifying cause of QT interval lengthening or arrhythmias has been identified in malnourished patients.[1] Specifically, one study showed no clear relationship between ECG changes and hypocalcemia, hypomagnesemia or hypokalemia in obese patients experiencing rapid weight loss.[2] It has been postulated that extracellular electrolyte levels do not correlate well with possible intracellular electrolyte abnormalities and are therefore not a reliable screen.

In anorexic patients the exact pathological basis of a long QT interval is also unknown. In a multiple regression analysis, low weight, low BMI and recent rapid weight loss were the most important independent predictors of QTc interval prolongation.[3] It has also been found that hypokalemia more commonly accompanies QT prolongation in anorexic patients, especially if bulimic tendencies are present. For the recognition of patients who are at particular risk of sudden death, measurement of the QT interval has a poor predictive value. A measured QT interval > 600 ms is associated with a significant risk of sudden death, but few patients will have such a long QT interval.[4]

Patients with severe anorexia nervosa and bulimia should have a screening ECG and electrolyte profile.[1] For those patients at risk, refeeding is extremely important because it shortens their QT interval within 1 to 2 months.[4]

Competing interests: None declared.

References

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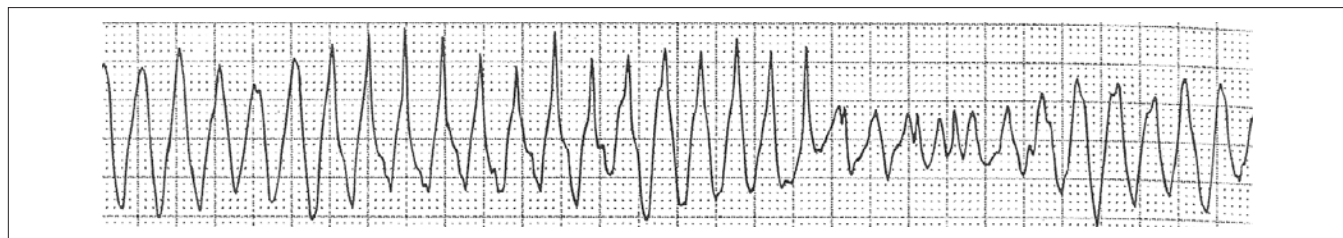**Correspondence to:** kirk-hollohan@shaw.ca

Fig. 1. Shows a brief episode of a ventricular arrhythmia, most likely torsade de pointes.

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