

## Wide Complex Tachycardia in a Critically Ill Patient: What is the Rhythm?

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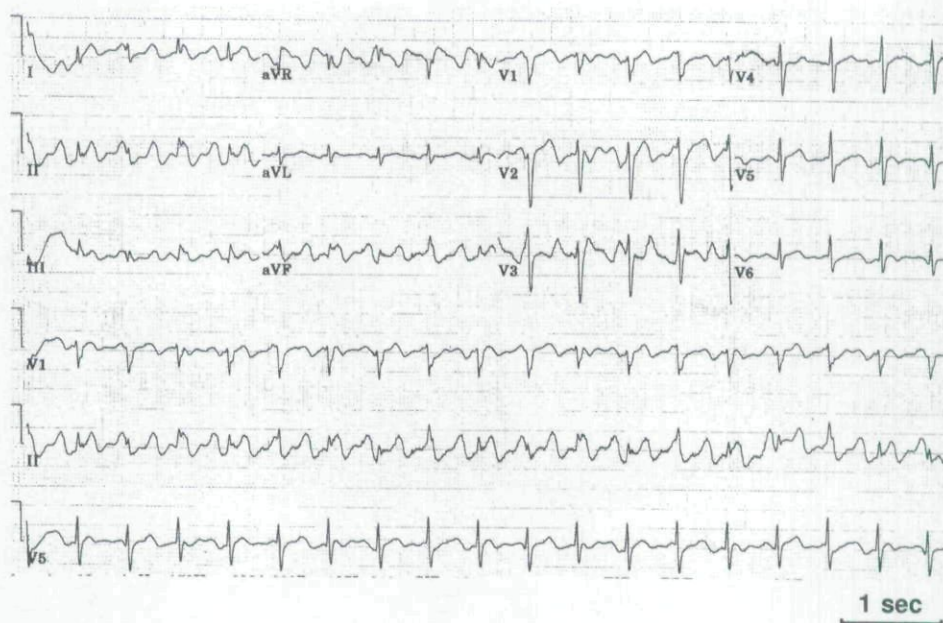
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### Case Presentation

A 36-year-old man with severe pancreatitis developed adult respiratory distress syndrome and required extracorporeal membrane oxygenation (ECMO). After several hours of ECMO, a wide complex tachycardia was noted on a cardiac monitor (Fig. 1). Adenosine was administered intravenously but had no effect on the wide complex tachycardia. A 12-lead ECG was obtained (Fig. 2). What is the rhythm?



**Figure 1.** A tachycardia at a rate of 180 beats/min recorded on a cardiac monitor in the intensive care unit.



**Figure 2.** ECG recorded shortly after the tachycardia shown in Figure 1 was noted.

### Commentary

The rhythm strip shown in Figure 1 demonstrates a tachycardia at a rate of 180 beats/min that appears to be ventricular in origin, with what seem to be QRS complexes that are 240 msec in duration, and with apparent AV dissociation. However, the 12-lead ECG reveals that the QRS complexes are narrow and that the ventricular rate is 115 beats/min. The wide complexes that have a rate of 180 beats/min shown in Figure 1 appear to be more consistent with atrial activity in Figure 2. However, there is no relationship between the QRS complexes and the wide complexes, the width of the wide complexes in several leads is 240 msec, and their amplitude is

much larger than would be expected for P waves. These features should bring to mind the possibility of an artifact.

The underlying rhythm in this case is sinus rhythm, and the wide complexes are an artifact generated by ECMO. With the roller pump of the ECMO machine set at 90 rpm and with two rollers per revolution, an apparent tachycardia at a rate of 180 beats/min was generated. Isolating the patient from the ECMO circuit blood flow markedly attenuated the artifact, allowing the underlying sinus tachycardia to become evident. A delay in recognizing that this was an artifact led to the unnecessary administration of adenosine, highlighting the importance of early recognition of ECG artifacts in critically ill patients.

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