

ECG Challenge: The Tachycardic Dribbler

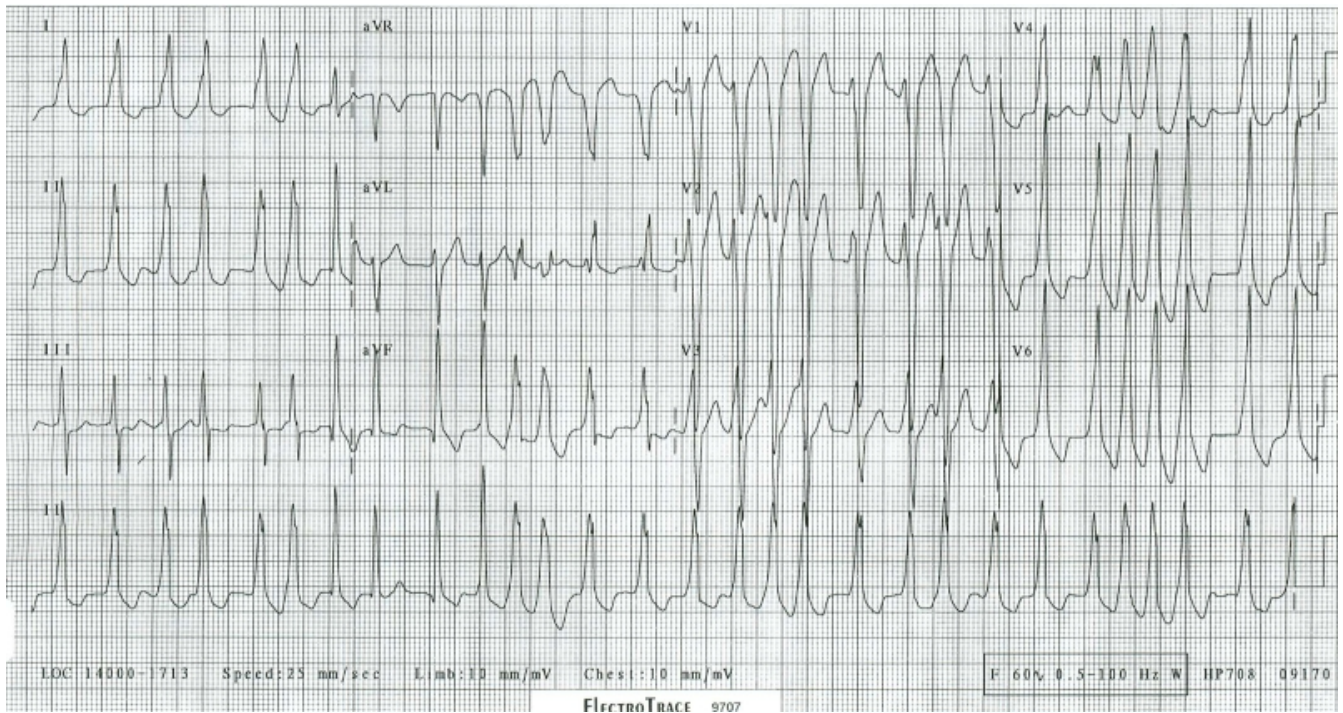
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Case History:

This 17-year-old male presented to the ED with a chief complaint of rapid heartbeat that had begun while playing basketball. There was no associated chest pain but mild dyspnea with ambulation. His blood pressure was 110/70 and, other than the tachycardia, his examination was normal.



Challenge: What is the diagnosis? What would be dangerous therapy? What would be safe and effective?

Answer:

The patient had a past history of Wolff-Parkinson-White (WPW) syndrome. The EKG shows a wide complex, irregular, tachycardia with delta waves shown well in leads I and V-4 through V-6. Thus the rhythm is atrial fibrillation with aberrant conduction via the accessory pathway. Atrial fibrillation occurs in about 20% of patients with WPW(1).

The primary decision to be made in encountering any tachyarrhythmia is whether or not the patient is stable or unstable. If the latter, immediate (electrical) cardioversion is indicated. If the patient is stable, as this patient was, chemical treatment of the tachycardia is appropriate. In AF with WPW many of the agents used in other tachycardias have the potential to precipitate ventricular fibrillation and are therefore contraindicated. This is particularly true with conduction down the accessory pathway that manifests as wide complex tachycardia, as in our patient. Agents with AV node blocking properties such as digoxin, verapamil, and adenosine may precipitate fibrillation. (2) Drugs that are effective do not act at the AV node and include ibutilide, flecainide, disopyramide, procainamide, and amiodarone (although associated with deterioration in a case report).

If the rhythm is regular and the complex is not widened the conduction is down the usual pathway (orthodromic) and responds to vagal

maneuvers or adenosine. Verapamil is an alternative. Even in this situation adenosine has been associated with the induction of atrial fibrillation.

References:

1. Al-Khatib SM, Pritchett ELC. Clinical features of Wolff-Parkinson-White syndrome. *American Heart Journal* 1999;138(3):403-13
2. Gulamhusein S, Ko P, Carruthers SG, et al. Acceleration of the ventricular response during atrial fibrillation in the Wolff-Parkinson-White syndrome after verapamil. *Circulation* 1982;65:348.

Competing Interest: None Declared

Funding: None Declared.

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