

Wide complex tachycardia in Wolff-Parkinson-White syndrome converted with modified Valsalva maneuver: A case report.

Lindsay Yoder, DO, Laura Chahoud, DO, Hope Ring, MD

Introduction:

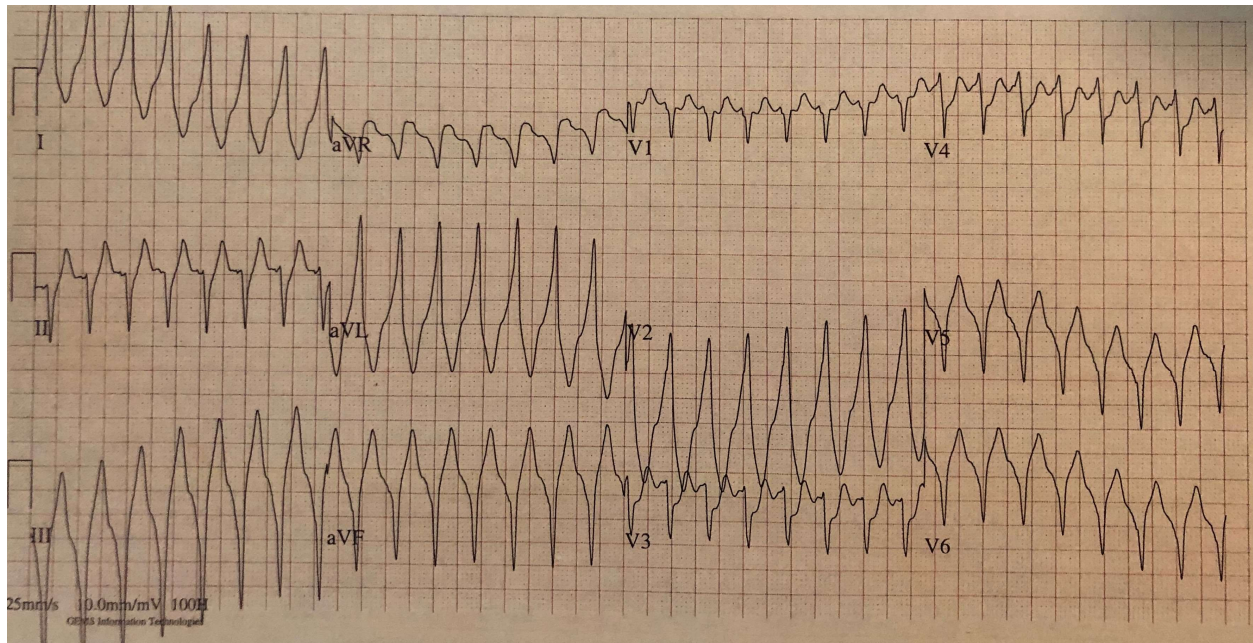
Wolff-Parkinson-White syndrome (WPW) is a congenital cardiac pre-excitation disorder that leads to abnormal electrical signaling in the heart. Patients with WPW have accessory electrical pathways that result in abnormal beats and tachycardia. Supraventricular tachycardias (SVT) are common in individuals with WPW. These episodes of SVT can last minutes to hours. Due to the accessory pathway, diagnosing a supraventricular rhythm can be difficult because the accessory pathway can lead to a wide complex SVT. Generally, SVT associated with WPW, whether wide complex or narrow complex, requires medical intervention or synchronized cardioversion in order to disrupt the abnormal pathway and return the heart to a normal sinus rhythm.

Case report:

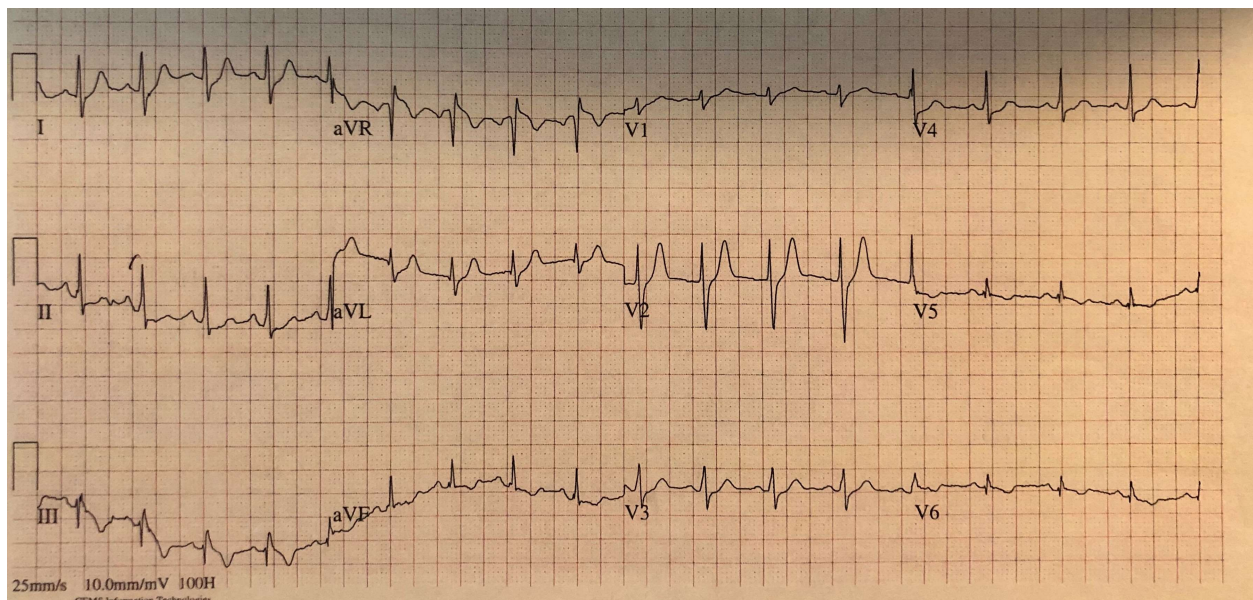
A 33-year-old male presented to the ED for evaluation, stating, "I am in SVT, and I have a history of SVT." The patient was brought back to the resuscitation bay immediately due to heart rate being greater than 180. The patient complained only of palpitations and denied other complaints, including chest pain and shortness of breath. The patient admitted to missing a dose of his beta blocker. He was placed on the cardiac monitor and found to be in a wide complex tachycardia. Pacer pads were placed immediately. The patient's other vital signs, including his blood pressure, remained stable.

The EKG showed a wide complex tachycardia with a rate of 183. After further questioning, the patient stated, "I don't have regular SVT. It's a weird kind that starts with a W." The patient then confirmed diagnosis of WPW and informed us that his cardiology team was planning to schedule an ablation.

Given the stability of the patient's blood pressure with normal mentation and perfusion, it was decided to attempt a modified Valsalva maneuver with bilateral straight leg raise for cardioversion, assuming that the widened QRS was due to SVT with aberrancy due to conduction over an accessory pathway. The patient was given a 10-cc syringe and instructed to blow the plunger out, as hard as he could, and we would then simultaneously lay him supine and elevate his legs after 10 seconds. On the count of 3, the patient began to blow into the syringe. This was maintained for 10 seconds, and then his legs were elevated. The cardiac monitor showed conversion to sinus rhythm with mild tachycardia, and repeat EKG confirmed sinus tachycardia with a rate of 106. His remaining vital signs were stable.



Pre-conversion EKG



Post Conversion: Delta wave of WPW best seen in lead V3 and II

Discussion:

In a normal cardiac cycle, electrical conduction travels via the atrioventricular node through the His-Purkinje system. Patients with pre-excitation syndromes such as WPW have additional pathways that directly connect the atria and the ventricles, allowing for the AV node to be bypassed. When the AV node is bypassed, this results in early activation, or pre-excitation. In patients with WPW, this is seen as a shortened PR interval with a delta waveform. This additional pathway can also lead to a certain type of SVT called AV reentrant tachycardia or AVRT.

Typical management of acute tachycardias in WPW patients requires pharmacotherapy using procainamide or another antiarrhythmic and/or synchronized cardioversion, depending on clinical picture and patient stability. Long term treatment of WPW often includes ablating the accessory pathway.

For tachycardias not associated with an accessory pathway, the first line of treatment is attempting vagal maneuvers. In recent years, a modified Valsalva technique has been described. This involves having the patient blow into a syringe followed by raising their feet.¹ This technique has been discussed as a way to treat narrow complex tachycardia, most notably SVT, but has not been discussed for treatment of wide complex SVT with aberrancy in the patient with an accessory pathway, such as WPW.

In summary, this case describes the successful cardioversion of wide complex SVT to sinus rhythm in a WPW patient using a modified Valsalva maneuver, rather than pharmacotherapy or synchronized cardioversion. Although this may not commonly work, potential risk is extremely low, making it worth a try.

¹ Appelboam A et al. Postural Modification to the Standard Valsalva Manoeuvre for Emergency Treatment of Supraventricular Tachycardias (REVERT): A Randomised Controlled Trial. Lancet 2015. [epub ahead of print] [PMID: 26314489](#)