

# Electrophysiological Testing and Ablation in an Asymptomatic Child with Wolff-Parkinson-White Syndrome

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The issue of treatment (ablation versus conservative management) for asymptomatic subjects with an electrocardiographic pattern of Wolff-Parkinson-White syndrome has long been debated. Based on an estimated very low annual risk of mortality during the lifetime of individuals with WPW (0.1%) [1], the most recent 2003 guidelines concerning asymptomatic patients [2] state: "The potential value of electrophysiologic testing in identifying high-risk patients who may benefit from catheter ablation must be balanced against the approximately 2% risk of a major complication associated with catheter ablation." In 2009, Klein and group [1] declared that they do not support changing the current guidelines. In the present report, we opted for "aggressive" management in a child using EP testing and ablation, as supported by recent studies from Pappone's group [3,4].

## PATIENT DESCRIPTION

A 12 year old boy playing in a volley ball team was sent to undergo an electrocardiogram. The tracing showed a pattern

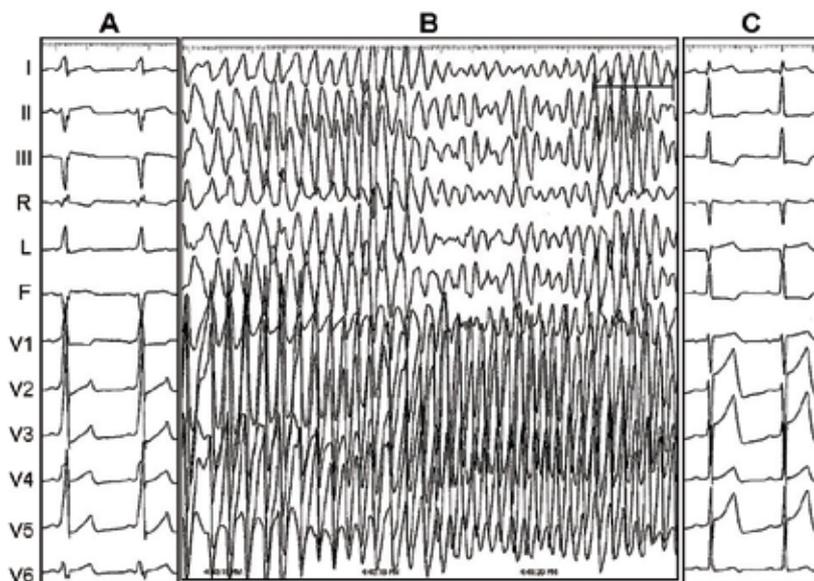
of WPW consistent with a left posterior accessory pathway [Figure A]. He had no history of palpitations or syncope. His cardiac examination and echocardiogram were normal. During exercise testing, the preexcitation pattern was still present, albeit to a smaller degree, at a rate of 180/min. Twenty-four hour Holter monitoring showed a permanent WPW pattern without any arrhythmia. After obtaining the parents' consent, an EP study was performed under general anesthesia.

Electrode catheters were placed in the coronary sinus, His bundle area and right ventricular apex. Incremental ventricular pacing was first performed showing a 1:1

conduction over the AP at a rate up to 200/min. During incremental coronary sinus pacing, there was a 1:1 conduction over the AP at a rate of 200/min preceding the occurrence of atrial fibrillation associated with a very fast ventricular rate (up to 320/min, cycle length 188 msec) [Figure B]. Shortly after, ventricular fibrillation [Figure B] occurred that required direct current shock. Transseptal catheterization was then performed. Acute successful ablation of the AP was achieved by delivering a single radiofrequency pulse at the left posterior

AP = accessory pathway

**Twelve lead ECG:** [A] Sinus rhythm with a QRS pattern compatible with a left posterior preexcitation before ablation. [B] Ventricular fibrillation initiated by rapid atrial fibrillation over the accessory pathway (first 6 QRS complexes). [C] Sinus rhythm after successful radiofrequency ablation of the left posterior accessory pathway.



WPW = Wolff-Parkinson-White  
EP = electrophysiologic

area of the mitral valve annulus [Figure C]. The patient was discharged home the following day. He was instructed to resume his sporting activities 1 month later after ECG confirmed the non-recurrence of preexcitation.

Four months after ablation, the ECG showed recurrent conduction over the AP. A repeat ablation procedure was performed using a retrograde arterial approach without any complication. The AP was ablated at the second radiofrequency pulse. Six months later, the ECG did not show ventricular preexcitation.

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## COMMENT

In contrast with the results of prior studies suggesting that the prognosis of asymptomatic children with WPW is usually good [5], several recent studies by Pappone and coworkers [3,4] have shown that in these patients the risk of life-threatening arrhythmias and/or sudden death during long follow-up periods is not negligible. In a large prospective study of 184 asymptomatic children aged 8–12 years undergoing EP study and monitored during a median follow-up of 57 months [4], they found that 19 (10.3%) exhibited rapid preexcited atrial fibril-

lation (mean ventricular rate 280/min) during follow-up. The arrhythmia led to aborted cardiac arrest with documented ventricular fibrillation in three patients and syncope in three others. The arrhythmic events were frequently the first initial presenting symptom. Importantly, an effective refractory period of the AP < 240 msec (i.e., conducting at a rate > 250/min) was, along with the presence of multiple APs, an important risk factor associated with increased occurrence of life-threatening events [4].

In our patient the antegrade effective refractory period of the AP was very short (188 msec). In addition, sustained atrial fibrillation could be easily induced during moderate atrial pacing (200/min), suggesting a marked propensity for future occurrence of this arrhythmia. Finally, the occurrence of ventricular fibrillation during EP testing, as observed in our patient, is very rare in asymptomatic WPW patients and could represent an additional risk factor of future life-threatening events. Based on our present case and the research of Pappone et al. [3,4], we recommend that EP testing be conducted to select asymptomatic children (> 8 years) with WPW syndrome who may benefit from prophylactic cath-

eter ablation. Such a procedure can offer lifetime benefits that obviate the minimal risk of the procedure [3] when performed in experienced EP centers.

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