EDITORIAL

Ablation for Wolff–Parkinson–White syndrome: a life-saving procedure

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In 1893, Stanley Kent described, for the first time, extra connections between the right atrium and the right ventricle in a monkey heart. These bundles were initially interpreted as normal atrioventricular connections.[1] In the following years, Kent's name became associated with both left and right accessory pathways (APs) also in human hearts. The constellation of clinical findings we now refer to as Wolff–Parkinson–White (WPW) syndrome was first described in 1930.[2] Only later, Holzmann and Scherf[3] interpreted the bundles described by Kent as atrioventricular abnormal connections and found a relation with morphological anomalies of the QRS (a delta wave).

After more than one century of research, we have broadened our knowledge about true accessory connections, and we have learned how anatomical and electrophysiologic variations of these connections account for an important spectrum of clinical syndromes and tachyarrhythmias. We learned that in the majority of cases this syndrome is relatively benign, but it still carries a risk of sudden cardiac death (SCD), which led to accurate risk management.

The WPW syndrome is relatively common and found in 0.2% to 0.4% of the population; it is usually asymptomatic and incidentally discovered.[4] If the management of symptomatic patients is well defined, therapeutic strategies for asymptomatic patients are not yet univocally accepted. The lifetime risk of mortality in asymptomatic individuals can never be accurately known, but it was estimated to be in the range of 1 per 1000 (annual risk, 0.1%).[5] A short anterograde refractory period of APs, inducibility of sustained tachyarrhythmias, including atrial fibrillation (AF), and the presence of multiple APs are the strongest predictors of life-threatening arrhythmias and SCD.[6] Therefore, invasive electrophysiological study can determine arrhythmias inducibility, AP location and number, tachyarrhythmia mechanism, and conduction characteristics of APs to stratify the risk of SCD. However, the value of a functional parameter, such as the effective refractory period, cannot be considered absolute, as it is influenced by the contextual autonomic tone at the time of its determination and by clinical conditions, such as fever, anemia, endocrine disorders, electrolyte disorders, and use of drugs. What we evaluate and measure in a specific case could therefore be only an indicative value and not necessarily stable over time.[7] We have limited knowledge on the stability of the measurements we make from test to test, and how they vary with time and developmental stage. We still do not fully understand the meaning of intermittent preexcitation. Moreover, ventricular fibrillation (VF) could be the first presentation of WPW syndrome. Despite these uncertainties, we must try to achieve a balance between application of a catheter-based procedure with excellent success rates and low procedural risk vs a condition with little but not zero risk of a life-threatening arrhythmia.[8,9]

In this issue of *Kardiologia Polska* (*Kardiol Pol*, *Polish Heart Journal*), Moskal et al[10] reported a retrospective cohort study on 602 consecutive patients referred for an electrophysiological study or AP ablation. The authors showed that 7.2% of patients had serious AP-related events, emphasizing not only the arrhythmic events but also unusual consequences of untreated APs. Among the latter, manifest preexcitation can be the cause of regional wall motion abnormality and related ventricular remodeling with an increased risk of systolic dysfunction and heart

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failure (HF), as reported also in the Copenhagen ECG Study.[11] In general, septal and right APs are more likely to cause left ventricular dyssynchrony and dysfunction.[12] Other cases of HF may result from tachycardiomyopathy due to incessant atrioventricular reentrant tachycardia (AVRT). Regarding the risk factors for malignant ventricular arrhythmias, the most important mechanism of SCD in patients with WPW syndrome is the onset of AVRT, which can degenerate into AF and then into VF, especially when the AP conduction to the ventricles is very fast (>300 bpm).

Moskal et al[10] identified 3 risk factors for VF and malignant AF: a shorter preexcitated RR interval (SPRRI), AF or AVRT inducibility, and older age. Ventricular fibrillation and malignant AF occurred also in asymptomatic patients, and VF could be the first presenting arrhythmia in this population, demonstrating that asymptomatic patients could have the same risk profile as the symptomatic ones.[13] Generally, the shorter SPRRI in AF is considered to be the best predictor of rapid antegrade conduction and to be linked to SCD risk, although in this study the authors showed a poor sensitivity of this parameter. For the first time, as reported in this study, in patients with AP, older age has been associated with malignant arrhythmias probably due to the increase in the prevalence of AF with age. This finding is in contrast with the results of other studies that reported the occurrence of VF only in children and adolescents with APs. Furthermore, in the case of aborted SCD, the presence of APs should be excluded to avoid unnecessary implantable cardioverter-defibrillator implantation. In this study, the implantable cardioverter-defibrillator was explanted in 1 patient after the diagnosis of WPW syndrome, effectively treated with AP ablation.

The study limitation, as the authors suggest, is typical for single-center retrospective observations, with potential referral bias. Well-designed and conducted prospective studies, especially randomized controlled trials of ablation versus no ablation, could be useful, but leaving patients in the "untreated arm" would not be ethical. Prophylactic radiofrequency catheter ablation of APs resulted in a risk reduction of 92% over a 5-year follow-up.[14] The data presented in the article by Moskal et al[10] remind us that radiofrequency catheter ablation for APs is a procedure with very high success rates without major complications, as reported by high-volume centers with highly experienced electrophysiologists. In contrast, untreated APs may result in severe and devasting complications. Therefore, it becomes unacceptable that even one patient with WPW syndrome is left at risk of SCD, life-threatening arrhythmic events, or unusual consequences such as stroke, pulmonary edema, heart failure, and unnecessary device implantation.

The ablation strategy, reducing the risk of SCD, has become widely available as a gold standard treatment for APs.

ARTICLE INFORMATION

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