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Latent complete atrioventricular block in a patient with Wolf-Parkinson-White syndrome and fast paroxysmal atrial fibrillation

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Latent complete atrioventricular block in a patient with Wolf–Parkinson–White syndrome and fast paroxysmal atrial fibrillation

Utajony całkowity blok przedsionkowo-komorowy u chorego z zespołem Wolfa–Parkinsona–White’a oraz napadowym migotaniem przedsionków z szybką czynnością komór

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Abstract

The Wolf–Parkinson–White (WPW) syndrome is very rarely complicated with a complete atrioventricular block (AVB). In this case, the ventricle is activated entirely through the accessory pathway and the QRS complex is wide and exhibits maximum pre-excitation features. This case report describes a history of a 68 years old male with symptomatic WPW syndrome, episodes of rapid atrial fibrillation and complete atrioventricular block.

Complete heart block in WPW syndrome should be suspected in the presence of a very wide, torn QRS, PJ interval > 0.27 s and paroxysmal atrial fibrillation without atrioventricular re-entrant tachycardia episodes.

Key words: Wolf–Parkinson–White syndrome, complete atrio-ventricular block, paroxysmal atrial fibrillation, case report

Introduction

In Wolf–Parkinson–White (WPW) syndrome the complete atrioventricular block (AVB) occurs very rarely [1–3]. In this case, the ventricle is activated entirely through the accessory pathway and the QRS complex is wide and exhibits maximum pre-excitation features.

Case report

We report the case of a 68 years old male with symptomatic for many years WPW syndrome. Recurrent episodes of atrial fibrillation with rapid ventricular rate, up to 230 bpm and subsequent pre-syncope, were observed in recent months. On admission, the patient had atrial fibrillation with intermittent pre-excitation (Figure 1).

In addition, the patient had hypertension complicated by moderate left ventricular hypertrophy (interventricular septum 16 mm, left ventricular ejection fraction 55%), generalized atherosclerosis and type II diabetes mellitus. The electrocardiogram during sinus rhythm had a pattern of pre-excitation compatible with a left free wall accessory pathway, a PR interval of 118 ms, QRS duration of 198 ms, an R pattern in lead V1, and an S pattern with slurring in lead aVL (Figure 2).

The PJ interval was 316 ms, which was indicating the complication of the WPW syndrome with the AVB. Electrophysiology study revealed very short retrograde refraction \leq 200 ms, and antegrade $<$ 300 ms. Shorter coupling during the electrophysiology study was not examined due to the high risk for atrial fibrillation provocation. Atrioventricular re-entrant tachycardia (AVRT) was not induced. Subsequently, the ablation procedure was performed using a 7F, 4 mm tip ablation catheter, which was introduced from the right femoral artery and placed across the aortic valve at the mitral annulus on the free wall of the left ventricle. In the third second of radiofrequency energy application, pre-excitation disappeared, and a complete atrioventricular block occurred with a ventricular escape rhythm of 30 bpm (Figure 3). It is noteworthy that, the QRS during preexcitation was wider in comparison with QRS duration during ventricular escape rhythm (198 ms vs. 160 ms). Within the same day dual chamber pacemaker with a ventricular lead placed in the right ventricular outflow tract was implanted. The recurrences of the preexcitation were observed on the day following the ablation procedure and later on, what is more, episodes of fast atrial fibrillation were also repeatedly detected. After 2 months, the ablation procedure was repeated, resulting in permanent accessory pathway destruction. During the 30-month follow-up, no recurrences of preexcitation and rapid atrial fibrillation were noted. After 3 months of constant atrioventricular pacing, the patient was hospitalized due to exacerbation of heart failure.

Discussion

The diagnosis of complete heart block in WPW syndrome should be suspected in the presence of a very wide, torn QRS with paroxysmal atrial fibrillation but without AVRT. The PJ interval expands between the beginning of the P wave and the ending of the QRS complex and represents the time interval from the onset of atrial depolarization to the complete ventricular activation time. The PJ normal value is less than 0.27 s. The prolongation of the PJ interval is the electrocardiographic indicator of the first/third-degree AVB [4] or bundle branch block [5]. In the present case prolonged PJ interval, the disappearance of AVRT episodes and very wide, torn QRS during AF were indicating complete AV block within WPW syndrome. Changing the sequence of activation from the base of the left ventricle through the accessory pathway, to the right ventricle outflow tract (*via* pacing lead) may have caused a worsening of cardiac function in the study patient. Another factor responsible for heart failure *de novo* symptoms might be a substantial percentage of right ventricular pacing in the setting of complete atrioventricular block causing “pacemaker-induced cardiomyopathy”.

Conflict of interest

None declared.

Streszczenie

Zespół Wolfa–Parkinsona–White’a (WPW) rzadko bywa powikłany blokiem przedsionkowo-komorowym III stopnia. W takiej sytuacji komory pobudzane są wyłącznie poprzez impuls przechodzący przez drogę dodatkową, zespół QRS jest szeroki i wykazuje cechy maksymalnej preekscytacji. W poniższym przypadku przedstawiono historię 68-letniego pacjenta z objawowym zespołem WPW, epizodami migotania przedsionków z szybką czynnością komór oraz całkowitym blokiem przedsionkowo-komorowym.

Całkowity blok przedsionkowo-komorowy u chorych z zespołem Wolfa–Parkinsona–White’a powinien być podejrzewany w przypadku występowania bardzo szerokiego, zawężonego zespołu QRS, odstępu PJ trwającego $> 0,27$ s, a także u pacjentów z napadowym migotaniem przedsionków bez epizodów nawrotnego częstoskurczu przedsionkowo-komorowego (AVRT).

Słowa kluczowe: zespół Wolfa–Parkinsona–White’a, całkowity blok przedsionkowo-komorowy, napadowe migotanie przedsionków, opis przypadku

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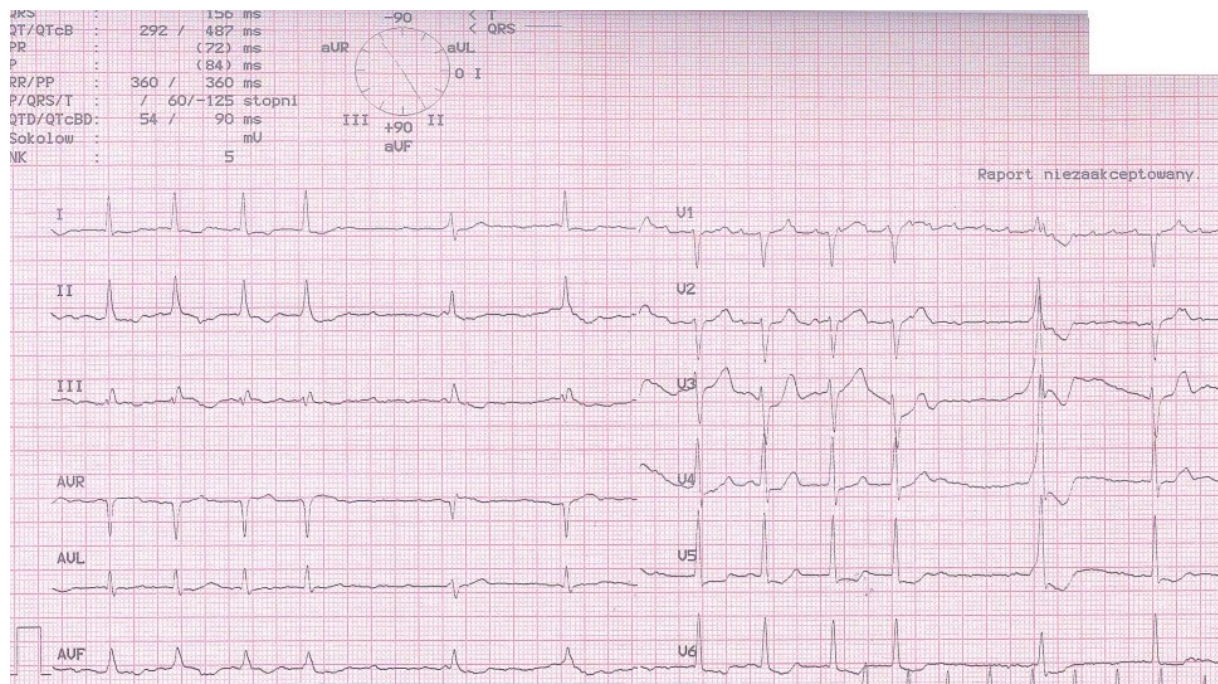


Figure 1. Atrial fibrillation with intermittent pre-excitation

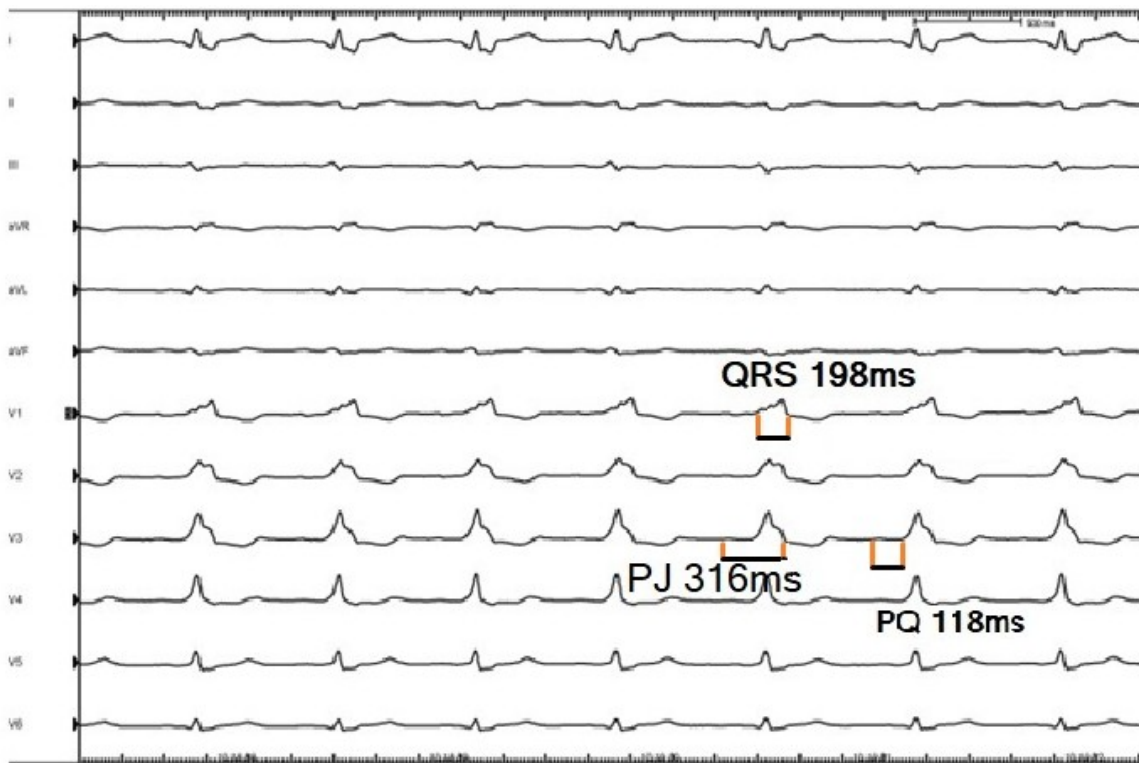


Figure 2. Electrocardiogram with preexcitation at the beginning of ablation

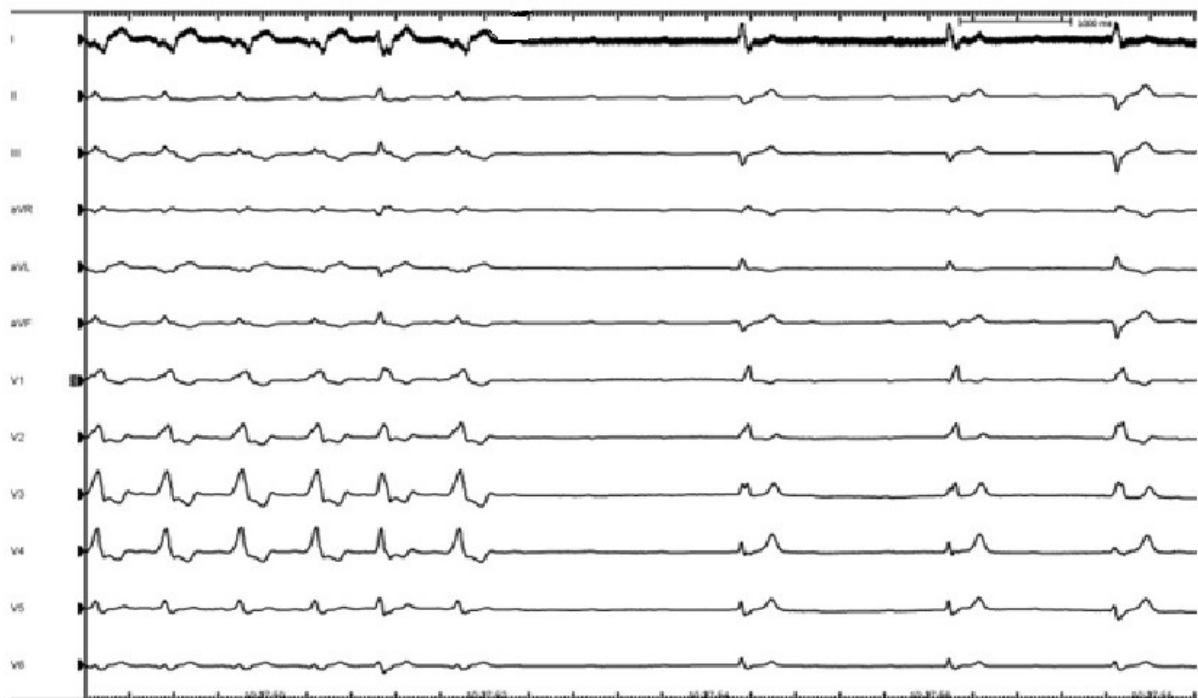


Figure 3. Electrocardiogram during ablation, the disappearance of preexcitation and complete atrioventricular block